

## LIFE ACTUARIAL (A) TASK FORCE

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Draft: 1/9/23

Life Actuarial (A) Task Force  
Tampa, Florida  
December 11–12, 2022

The Life Actuarial (A) Task Force met in Tampa, FL, Dec. 11–12, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil (CA); Andrew N. Mais represented by Wanchin Chou and Lei Rao-Knight (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang and Bruce Sartain (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Michael Muldoon (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT). Also participating were: Ted Chang (CA); and Doug Hartz (OR).

1. Adopted its Nov. 17, Nov. 10, Oct. 27, Oct. 24, Oct. 13, Oct. 6, Sept. 29, Sept. 22, Sept. 15, Sept. 8, and Aug. 25 Minutes and the Reports of the Variable Annuities Capital and Reserve (E/A) Subgroup, the Longevity Risk (E/A) Subgroup, and the Experience Reporting (A) Subgroup

The Task Force met Nov. 17, Nov. 10, Oct. 27, Oct. 24, Oct. 13, Oct. 6, Sept. 29, Sept. 22, Sept. 15, Sept. 8, and Aug. 25. During these meetings, the Task Force took the following action: 1) adopted the 2023 Generally Recognized Expense Table (GRET); 2) adopted templates for *Actuarial Guideline LIII—Application of the Valuation Manual for Testing the Adequacy of Life Insurer Reserves* (AG 53) submissions; 3) adopted Amendment Proposal Form (APF) 2022-06, which adds a requirement to disclose information regarding a company's inflation assumption in principle-based reserving (PBR) actuarial reports; 4) exposed APF 2022-07, which clarifies the VM-20, Requirements for Principle-Based Reserves for Life Products, net premium reserve (NPR) mortality adjustment; 5) adopted the 2022 American Academy of Actuaries (Academy) Mortality Improvements Life Work Group (MILWG) and Society of Actuaries (SOA) Mortality and Longevity Oversight Advisory Council (MLOAC) recommendation for historical mortality improvement (HMI) and future mortality improvement (FMI) tables; 6) exposed a draft Index-Linked Variable Annuity (ILVA) Actuarial Guideline; 7) adopted its Summer National Meeting minutes; 8) exposed a referral from the Financial Regulation Standards and Accreditation (F) Committee; 9) exposed an NAIC staff memorandum and recommendation for a replacement for the London Interbank Offered Rate (LIBOR); 10) adopted its 2023 proposed charges; and 11) exposed an NAIC staff memorandum regarding guidance on the allocation of interest maintenance reserves (IMRs) in VM-20; VM-21, Requirements for Principle-Based Reserves for Variable Annuities; and VM-30, Actuarial Opinion and Memorandum Requirements.

The Task Force reviewed the reports of the Variable Annuities Capital and Reserve (E/A) Subgroup, the Longevity Risk (E/A) Subgroup, and the Experience Reporting (A) Subgroup.

Chupp made a motion, seconded by Leung, to adopt the Task Force's Nov. 17 (Attachment One), Nov. 10 (Attachment Two), Oct. 27 (Attachment Three), Oct. 24 (Attachment Four), Oct. 13 (Attachment Five), Oct. 6 (Attachment Six), Sept. 29 (Attachment Seven), Sept. 22 (Attachment Eight), Sept. 15 (Attachment Nine), Sept. 8 (Attachment Ten), and Aug. 25 (Attachment Eleven) minutes and the reports of the Variable Annuities Capital and Reserve (E/A) Subgroup (Attachment Twelve), the Longevity Risk (E/A) Subgroup (Attachment Thirteen), and the Experience Reporting (A) Subgroup (Attachment Fourteen). The motion passed unanimously.



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### 2. Adopted the Report of the Index-Linked Variable Annuity (A) Subgroup

Weber noted that the Subgroup held three calls since the Summer National Meeting, where a fourth and fifth exposed version of the proposed Actuarial Guideline Index-Linked Variable Annuity (AG ILVA) and associated comments were discussed. At the most recent call on Sept. 27, he noted that the Subgroup unanimously voted to move AG ILVA on to the Life Actuarial (A) Task Force.

Weber made a motion, seconded by Chupp, to adopt the report of the Index-Linked Variable Annuity (A) Subgroup, including its Sept. 27 (Attachment Fifteen), Sept. 20 (Attachment Sixteen), and Aug. 29 (Attachment Seventeen) minutes. The motion passed unanimously.

### 3. Adopted the Proposed Actuarial Guideline ILVA

Weber said one remaining sticking point with the AG ILVA had to do with how market value adjustments (MVAs) would be reflected for ILVA products. In the latest exposed version of the AG ILVA (Attachment Eighteen), he noted that language was added in a guidance note to allow states to consider whether an MVA should be included in the determination of interim values. He said the Task Force has received two comment letters on the latest exposed version of the AG ILVA.

Weber first addressed the comment letter from Tom Kilcoyne (PA-Retired) (Attachment Nineteen), including his recommendation to consider: 1) whether product designs with a zero floor are in scope; 2) changing the “recognize initial option pricing parameters” language to be “recognize initial option pricing market conditions”; and 3) expanding the effective date language. He recommended that no language changes be made regarding the first recommendation in his letter. For Kilcoyne’s second consideration, Weber recommended that Kilcoyne’s suggested language change be included in the AG ILVA. Weber finally noted that he discussed the Kilcoyne letter with representatives from the industry; in a similar spirit to Kilcoyne’s third consideration, Weber recommended adding “including associated riders, endorsements, or amendments” to the AG ILVA to clarify the scope. Robust discussion from state insurance regulators and interested parties ensued before the Task Force settled on continuing with Weber’s recommendations related to the Kilcoyne comment letter.

Brian Bayerle (American Council of Life Insurers—ACLI) then discussed the comment letter (Attachment Twenty) from the ACLI and the Committee of Annuity Insurers (CAI) regarding their concern that the drafting note in the latest exposed version of the AG ILVA contains a preference for the inclusion of an MVA. Hemphill noted a preference for the word “appropriate” rather than “necessary” in the drafting note. Bayerle agreed, but he asked that the phrase “should be applied” be changed to “is appropriate” later on in the drafting note for consistency, to which Hemphill agreed. On the question of bias in the drafting note related to the state insurance regulators considering the appropriateness of the inclusion of an MVA, Hemphill suggested adding “including or excluding” instead of just “excluding.”

Weber made a motion, seconded by Slutsker, to adopt the AG ILVA with the discussed language changes. The motion passed unanimously.

### 4. Adopted the Report of the VM-22 (A) Subgroup

Slutsker noted that the Valuation Manual (VM)-22 (A) Subgroup was meeting roughly every two weeks since the beginning of April 2022 before slowing down the frequency of meetings in the two months leading up to the Fall National Meeting. After reviewing over 400 comments, he noted that the Subgroup exposed a new version of the VM-22, Requirements for Principle-Based Reserves for Non-Variable Annuities, draft. He said a few of the key changes included: 1) adding language for a small company exemption; 2) clarifying the scope to specify that ILVA products are not included; and 3) including longevity reinsurance as a separate reserving category. He said after

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the latest version of the VM-22 draft was exposed, the Subgroup has focused on the assumptions and methodologies for the standard projection calculation. Looking forward to 2023, he said the Subgroup was planning for a VM-22 field test, but the timing is dependent on the NAIC's economic scenario generator (ESG) project. He said if the VM-22 field test is completed in 2023, the earliest that the VM-22 could be effective would be 2025. He noted that it is envisioned that a three-year transition period is expected to follow the implementation period, where the VM-22 framework could optionally be applied by companies before all new business in scope would be required to be valued under VM-22.

Slutsker made a motion, seconded by Chupp, to adopt the report of the VM-22 (A) Subgroup (Attachment Twenty-One), including its Nov. 30 (Attachment Twenty-Two), Oct. 27 (Attachment Twenty-Three), Oct. 12 (Attachment Twenty-Four), Oct. 4 (Attachment Twenty-Five), Sept. 21 (Attachment Twenty-Six), Sept. 7 (Attachment Twenty-Seven), Aug. 24 (Attachment Twenty-Eight), and Aug. 17 (Attachment Twenty-Nine) minutes. The motion passed unanimously.

### 5. Adopted Revisions to AG 49-A

Andersen said the Indexed Universal Life (IUL) (A) Subgroup is planning to proceed with the illustration-related project in three phases: 1) consideration of the adoption of the "quick-fix" to *Actuarial Guideline XLIX-A—The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest to Policies Sold on or After December 14, 2020* (AG 49-A); 2) listening to comments on whether to recommend a targeted opening of the *Life Insurance Illustrations Model Regulation* (#582); and 3) considering recommendations that would affect all illustrations, not just those related to life insurance. Regarding the first phase, he noted that draft revisions to AG 49-A (Attachment Thirty) had been exposed, and a comment letter from the ACLI (Attachment Thirty-One) was received. He said there was a request from the ACLI to push back the effective date of the AG 49-A revisions. Bayerle stated that the ACLI was requesting additional time before implementation to allow companies to update their illustration systems and training materials for agents. Birny Birnbaum (Center for Economic Justice—CEJ) asked whether the revisions to AG 49-A would be effective only for newly issued products, noting the potential challenges state insurance regulators could face monitoring multiple regulation eras with different requirements. He further inquired as to whether state insurance regulators would consider illustration regulations that would apply not only to new issues but to companies' entire in-force products to avoid the potential for misleading product illustrations. Andersen asked if any Task Force members have an objection to the effective date being applied prospectively to new issues. No Task Force members objected.

Andersen then walked through some editorial or minor typo corrections to the revised AG 49-A that were identified during the previous exposure period.

Chupp made a motion, seconded by Chou, to adopt the revised AG 49-A with an updated effective date of May 1, 2023, along with the editorial and typo corrections that were discussed. The motion passed unanimously.

### 6. Adopted the Report of the IUL (A) Subgroup and Discussed Comments Received on the Exposure of the Request for Comment on Ideas for Changes to Model #582

Andersen noted that comments have been received regarding recommendations for addressing concerns with IUL illustrations through potentially making changes to Model #582 or some other means (Attachment Thirty-Two). Bayerle addressed the ACLI's comment letter (Attachment Thirty-Three), noting that it would continue to work with state insurance regulators to improve consumer understanding of life insurance illustrations. He requested that the Task Force develop principles around how life insurance illustrations should function, and he included a recommended set of principles in the ACLI's comment letter. Andersen said his understanding is that products compete most on the best-estimate portion of the illustration, while the adverse portion does not get enough attention, perhaps leaving consumers without a full understanding of the product. He said the task ahead is to

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provide consumers with enough complexity for them to be able to understand the range of values a policy could experience, while also making the illustration simple enough to understand.

Andersen then noted the comment letter from the Coalition of Concerned Insurance Professionals (Attachment Thirty-Four), before calling a representative from the group of seven companies to speak to their comment letter (Attachment Thirty-Five). Austin Bichler (Allianz Life) noted that the group of seven companies are supportive of the principles laid out in the ACLI comment letter, but that it is particularly focused on providing the consumer with more information on how product performance could vary. Tsang noted a concern that IUL illustrations could illustrate better values and limit sales of traditional fixed universal life insurance, and this could cause competitive issues between large and small companies. Bichler agreed that it is desirable for illustrations to not prefer one product type over another, and this could be accomplished by improving the consumer understanding of risk and reward with different product types.

Brian Lessing (Academy) then discussed the Academy's comment letter (Attachment Thirty-Six). He stated that the Academy needs more clarity on how certain product features should be illustrated, and he produced a series of questions in the comment letter to foster that understanding. Regarding the question of whether Model #582 needs to be updated to address issues with illustrations, he stated that it would depend on the nature of the solution required.

Chris Conrad (Transamerica) noted that Transamerica supports the comments in the ACLI letter, but that it also wants to highlight an additional issue regarding its ability to provide illustrations to customers on in-force business in its comment letter (Attachment Thirty-Seven). Currently, he said Transamerica is unable to provide illustrations to customers on in-force policies that fail either the lapse-support test or the self-support test due to existing regulations. He suggested that a change be made to Model #582 to allow for companies to provide these illustrations to policyholders on their in-force business, regardless of whether either the lapse-support or self-support tests are passed. Carmello noted that New York has never required the self-support or lapse-support tests to provide an in-force illustration. Andersen noted that the Task Force needs to consider whether it would recommend that the Life Insurance and Annuities (A) Committee open up Model #582 for just this issue or if it would be included in a package of issues.

Sartain said he looked into an illustration for a relative and found that it only included an illustration of the non-guaranteed values and not the minimum guaranteed values, and he believes this is a disservice to the policyholder. He said he quickly reviewed Model #582 and found that only showing the non-guaranteed portion would be allowed. Carmello noted that if that is the case, Model #582 should be opened up, but he believes New York would require the guaranteed portion of the illustration to be provided. Chou noted that if serious enough issues are found with in-force illustrations, he would not wait to send multiple issues to the Life Insurance and Annuities (A) Committee to resolve in Model #582 as a package and instead send them individually.

Birnbaum said he appreciates the time and effort the Task Force has put into working on illustration issues, but he recommends that the Task Force move these efforts to other groups at the NAIC that have other skill sets to address problems with both life and annuity illustrations. He said the three-step approach outlined by Andersen would only delay the necessary reengineering required for a holistic fix to life and annuity illustrations. He stated that the solutions the Task Force has put forth in the past have resulted in the increased complexity of insurance product designs that are designed only to maximize the annual crediting rates shown on the illustration, and the current illustrations failed to capture risk and reward. He finished his comments by recommending that the Life Insurance and Annuities (A) Committee work with the Market Regulation and Consumer Affairs (D) Committee to holistically review all of the NAIC model regulations associated with life insurance and annuity illustrations and develop key principles for illustrating the components of the insurance policy or contract.

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Hemphill noted that she believes Andersen's three-phase approach makes sense, particularly because it could help address some of the "lower-hanging fruit" first before moving on to more complex issues. Chou said actuaries possessed many of the key financial skillsets necessary to design illustrations that can be understood by consumers. Serbinowski noted his support for Birnbaum's recommendation, to which Sartain agreed and stated that he would like this project to go to the Life Insurance and Annuities (A) Committee sooner rather than later.

Andersen made a motion, seconded by Chupp, to resolve to continue work at the Subgroup level on illustration issues and adopt the report of the IUL (A) Subgroup, including its Nov. 9 (Attachment Thirty-Eight) and Oct. 12 (Attachment Thirty-Nine) minutes. Additional discussion by state insurance regulators and interested parties regarding the potential for opening up Model #582 occurred during the motion. Subsequently, the motion passed unanimously.

### 7. Discussed the Academy's ESG Simplified Corporate Model

Jason Kehrberg (Academy) said the purpose of discussion is to summarize some of the key points from an updated version of the Academy's previously presented corporate model presentation (Attachment Forty) and address questions that were provided to them after that initial presentation (Attachment Forty-One). He recapped that the previous presentation focused on qualitative stylized facts and largely quantitative acceptance criteria, along with a recommended alternative simplified corporate model developed by the Academy. Iouri Karpov (Academy) then walked through the details of the proposed simplified corporate model. Hemphill asked if the use of the single random driver for all indices that captured 90% of the spread variation across indices could miss key portions of historical spread behavior and potentially understate the tail measures used in reserve and capital calculations. Karpov responded that a single driver is equivalent to assuming that spread levels are moving in tandem across the modeled indices, but due to the different volatilities for each index, the spreads for the different indices can experience non-parallel movements. What is missing, he stated, is some of the more complex nonparallel shifts between indices. However, he said much of the risk associated with bond funds arises from situations where the credit spreads gap, which is a feature that is well captured by the simplified model. Hemphill asked if an analysis could be provided that could get at the materiality of the simplification, to which Karpov replied that the analysis could be provided.

Kehrberg then went over the Academy's responses to the questions on the corporate model presentation. Responding to question five on whether the Academy evaluated the VM-20 spread and default methodology for appropriateness when including it in the simplified corporate model, he responded that the Academy did not perform an evaluation of the VM-20 spread and default assumptions, but it believed consistency was desirable. Hemphill said she wants to ensure the Task Force is evaluating the VM-20 spread and default requirements for appropriateness before moving forward with adopting their use in the simplified corporate model. Tsang asked whether the purpose is to replace the Conning corporate model for use in statutory reserve and capital calculations or whether they are simply trying to check the results. Kehrberg confirmed that the purpose is to replace the Conning corporate model due to concerns regarding the level of documentation arising from the proprietary nature of the Conning corporate model.

### 8. Heard a Presentation from the Academy on ESG Interest Rate Stylized Facts and Acceptance Criteria

Kehrberg said the intention of the presentation (Attachment Forty-Two) is to provide recommendations on a set of stylized facts and acceptance criteria for the U.S. Treasury component of the ESG. He stated that the Academy is not proposing an alternative Treasury model as part of its recommendation, due to the completeness of the documentation that Conning has provided. Once he discussed the recommended stylized facts, Link Richardson (Academy) walked through the proposed acceptance criteria. Mark Tenney (Mathematical Finance Company) noted that the Federal Reserve had a model of the U.S. economy that produced negative interest rates, and from a central bank perspective, negative interest rates could be used as a tool to stimulate the economy. Discussion

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ensued, with Academy representatives noting that the stylized facts and acceptance criteria allowed for negative interest rates, before Hal Pedersen (Academy) suggested that the Task Force revisit this later in the presentation.

Yanacheak asked about how the stylized fact of higher interest rate volatility during times of market stress was incorporated into the acceptance criteria. Kehrberg replied that it was not explicitly included in the acceptance criteria, but the Academy is open to discussing. Yanacheak said it may be challenging to produce an acceptance criterion for that stylized fact, given the challenges of defining a stressed market. Hemphill asked if the 1<sup>st</sup> and 99<sup>th</sup> percentiles could be added to the acceptance criteria for the yield curve slope to align with the conditional tail expectation (CTE) 98 metrics used for capital, to which Kehrberg said the Academy would provide. On the low for long acceptance criteria, Hemphill noted that there are limits to what could be gleaned from historical data due to the Task Force's desire to see scenarios that are plausibly more adverse than history. Kehrberg said the Academy would continue work on refining the low for long acceptance criteria with those limitations in mind. Tenney said an analysis using the Taylor Rule of historical unemployment rates, inflation rates, and the output gap would imply more negative interest rates than what is being considered by the Academy and the NAIC. Pedersen said he would reach out to Tenney to understand the specifics of this type of analysis.

### 9. Adopted the NAIC Staff Recommendation Memorandum on a Replacement for LIBOR

Pat Allison (NAIC) walked through the NAIC staff recommendation memorandum (Attachment Forty-Three) on a replacement for LIBOR. She noted that the NAIC staff memorandum references a memorandum produced by the Academy (Attachment Forty-Four), as the NAIC received assistance from the Academy on certain technical aspects of the transition from LIBOR. She stated that the Secured Overnight Financing Rate (SOFR) would replace LIBOR for swap spreads and would be effective at the end of 2022. Hemphill noted the Academy's most recent comment letter (Attachment Forty-Five) that supported the NAIC staff recommendation. Bayerle then discussed the ACLI's comment letter (Attachment Forty-Six) that requested that Table J be produced using historical SOFR data, and he inquired as to the methodology on determining the average for the current spreads from two sources of data. Allison noted that the NAIC would provide Table J current swap spreads, with some simplifications, using SOFR data as far back as July 2022 with the data it had access to.

Yanacheak made a motion, seconded by Weber, to adopt the NAIC Staff recommendation memorandum on a replacement for LIBOR. The motion passed unanimously.

### 10. Heard an Update on VM-50 and VM-51 of the *Valuation Manual*

Allison went over a presentation (Attachment Forty-Seven) that provided an update on the NAIC's mortality experience data collection process. She said data was collected from 108 insurance companies for 2018 and 2019 as part of the first year of the NAIC's mortality experience collection, which represented approximately 92% of the business in scope. She said the NAIC has provided actual to expected ratios for each company on each of their submissions, and 81 companies have responded that they look reasonable. She said the NAIC is working with the remaining companies and the Missouri Department of Commerce and Insurance to investigate any discrepancies in the actual to expected ratios and follow up with companies that have not yet responded to inquiries. She said the NAIC is allowing companies to resubmit 2018 and/or 2019 experience data if they found issues with the data after receiving the actual to expected analysis from the NAIC, with five already having resubmitted.

Allison noted that there are several changes for the 2022 mortality experience data collection, including a revised file layout, a voluntary set of new plan codes, and the ability for reinsurers or third-party administrators (TPAs) to submit data on behalf of a client company. She said companies would also benefit from enhancements to the Regulatory Data Collection system (RDC) that allow companies to download their data exceptions, a data dictionary that provides additional guidance and exceptions for each field, and improvements to the data validation checks that the NAIC performs to review the data. Finally, she recommended an extension to the time

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frame for corrected data submissions. She said the *Valuation Manual* specified a due date of Sept. 30 for initial submissions and Dec. 31 for corrected submissions, and the NAIC was recommending a new due date of Feb. 28, 2023, for corrected submissions to allow for more time for companies to review and correct issues.

Weber asked if the NAIC could extend the timeline given its role as administrator or if the *Valuation Manual* would need to be changed. Allison noted that a *Valuation Manual* amendment would eventually be needed once the right date is decided. Bayerle asked if the NAIC would be submitting data on May 31, 2023, for all three years of experience collection or if data has already been submitted to the SOA. Allison stated that 2018–2019 data from the first year of the NAIC collecting mortality experience data had been provided to the SOA but given that the NAIC was allowing companies to resubmit their 2018–2019 data, there would be a revised submission of data to the SOA. Bayerle then asked if the NAIC expects some amount of lag due to corrections needing to be made to the data or if that time lag would eventually diminish as company data submissions improve. Allison replied that the NAIC was encouraged by the increase in quality of the data submissions that had been seen in this year’s data collection, but some amount of lag could remain due to insurance company turnover, changes to experience collection formats, and other factors.

Hemphill noted that no action is needed to allow for the extension of the deadline for corrected submissions to Feb. 28, 2023, but she asked if any Task Force members have objections to the extension. Hearing none, the discussion concluded.

### 11. Adopted an NAIC Staff Negative IMR Memorandum

Scott O’Neal (NAIC) said he presented an NAIC staff negative IMR recommendation memorandum (Attachment Forty-Eight) at the Nov. 17 Task Force meeting and provided a summary of that recommendation. He said if the memorandum is adopted by the Task Force, it could be made available on the NAIC website and sent to the Chief Financial Examiners of each NAIC jurisdiction, along with Task Force members and interested state insurance regulators and parties. Bayerle discussed the ACLI’s comment letter (Attachment Forty-Nine), and while it supports the NAIC staff recommendation, it has some suggestions to add more background and wording changes. Hemphill said she believes many of the ACLI’s language changes do not materially alter the meaning of the NAIC staff recommendation, and thus are not necessary. She noted the ACLI comment letter recommendation to add “LATF recommends” to the memorandum, and she instead suggested that a cover letter be added to note that the Task Force adopted the recommendation. She also suggested that the NAIC recommendation memorandum be revised to note the intention to not only assist state insurance regulators but also insurance companies, as suggested by the ACLI. Bayerle noted that he supports both of Hemphill’s suggestions.

Hartz noted that the Oregon Division of Financial Regulation received a request from a domiciled insurance company for a permitted practice to allow for negative IMR to be an admitted asset. He noted that while the permitted practice had not yet been granted, he expected that it likely would. Hemphill reaffirmed that this NAIC staff memorandum had been drafted to account for the potential for permitted practices to be granted around this issue and would ensure that an appropriate approach would be applied whether a company was given a permitted practice or not.

Chupp made a motion, seconded by Slutsker, to adopt the NAIC staff negative IMR memorandum, with the addition of a cover letter and a clarification of the purpose to also assist insurance companies. The motion passed unanimously.

## Draft Pending Adoption

### 12. Exposed APF 2022-08 that Clarifies Reporting and Governance Requirements for Groups of Contracts Using the VM-21 Alternative Method

Bayerle stated that the purpose of APF 2022-08 is to clarify the governance requirements for contracts that utilize the Alternative Method under VM-21. He said a similar approach was taken in VM-20, where groups of policies that were able to pass the stochastic and deterministic exclusion requirements were subject to only a subset of the *Valuation Manual* governance requirements. He said with the language changes in APF 2022-08, companies that valued groups of policies under the Alternative Methodology would still be required to produce relevant sub-reports of the PBR Actuarial Report, but they would be exempted from the governance requirements in Sections 2 and 3 of VM-G: Appendix G – Corporate Governance Guidance for Principle-Based Reserves. Hemphill noted that the language changes in APF 2022-08 appear to be straightforward and reasonable.

Slutsker made a motion, seconded by Chupp, to expose APF 2022-08 (Attachment Fifty) for a 21-day public comment period ending Jan. 4, 2023.

### 13. Heard an Update from the Academy Life Practice Council

Slutsker (Academy) walked through a presentation (Attachment Fifty-One) on the recent activities of the Academy's Life Practice Council, including conducting webinars on topics such as PBR, PBR Actuarial Reports, and the current inflationary environment. Looking forward, he noted that the Academy was planning more informational sessions on asset-related topics, assumptions, and detailed looks into certain product types. Donna Claire (Academy) then discussed the activities of the Academy's Life Experience Committee that was just formed in April. She stated that the purpose of the Life Experience Committee is to assist both practicing actuaries and state insurance regulators in developing and understanding experience assumptions, and it will be looking for membership from both industry actuaries and regulatory actuaries. She said the Life Experience Committee was involved with the development of mortality improvement assumptions for VM-20 and would be looking at other areas, including complex assets in the near term.

### 14. Heard an Update on the SOA's Research and Education

Dale Hall (SOA) provided an update (Attachment Fifty-Two) on some of the SOA's research and education endeavors. He noted a survey that was sent out to companies regarding their mortality improvement assumptions, an update to their mortality improvement model, research related to climate risk, and other key initiatives. He followed up on a discussion that was presented at the Summer National Meeting regarding the SOA's partnership with the Life Insurance Marketing and Research Association (LIMRA) on experience data collection, and he stated that the first report developed from this partnership would be released in the coming weeks.

Hemphill asked whether the SOA would have any concern with companies providing state insurance regulators with some of the reports produced from the partnership that are used in their assumption development. Hall stated that the SOA does not have any concern with companies sharing those reports, and it made sense as part of the regulatory review. Andersen noted that he appreciates the survey efforts of the SOA, and he asked if it has any plans for additional surveys on other topics, including the impact of rising interest rates. Hall responded that the SOA would plan on sending out recurring versions of its surveys to get an idea of the trend in responses, but it would also expand the range of topics that are surveyed. Tsang asked whether mortality improvement trends were similar across the insured and general population. Hall noted that they are distinct, and the selection that occurs in the individual life underwriting process, as well as socio-economic factors, leads to large differences in the mortality improvement between the populations.

## Draft Pending Adoption

### 15. Re-Exposed APF 2022-07

Bayerle provided background on APF 2022-07 (Attachment Fifty-Three) that clarifies the intent and calculation of mortality adjustments to the Commissioners' Standard Ordinary (CSO) table when anticipated mortality exceeds the prescribed CSO table, and he summarized the message of the ACLI's associated comment letter (Attachment Fifty-Four). Dave Neve (Actuarial Resources Corporation of Georgia) then noted how the current version of APF 2022-07 incorporated some of the ideas from Chupp's comment letter (Attachment Fifty-Five), but it did not incorporate the de-linking of these requirements to the deterministic exclusion test because it believes that would be a change in the requirements rather than just a clarification. Slutsker noted that APF 2022-07 seemed to require judgement on the level of aggregation of the mortality segments, and he asked how high of a level of aggregation would be allowed under the new language. Neve noted that language in APF 2022-07 stated that the aggregation of policies with significantly different risk profiles was not allowed, but it also specified that the highest level of aggregation allowed would be the reserving category level.

Slutsker made a motion, seconded by Chupp, to expose APF 2022-07 for a 21-day public comment period ending Jan. 4, 2023.

### 16. Heard a Presentation on the NAIC ESG Field Test Qualitative Survey Results

Allison noted that the purpose of the presentation (Attachment Fifty-Six) is to discuss the results of the qualitative survey portion of the NAIC's ESG field test and support the work of newly formed VM-20/VM-21 ESG Technical Drafting Group that will be working on framework specific implementation issues. Allison said participation was strong, with the NAIC receiving qualitative surveys from 40 of the 41 participating companies. She then walked through the details of the summarized qualitative company responses. Connie Tang (Prudential) asked whether the application programming interface (API) tool was able to do some of the post-processing adjustments that were performed for the field test scenarios, such as the flooring of U.S. Treasury rates. Dan Finn (Conning) noted that the API tool simply provided out-of-the-box functionality, so it would not be able to do the flooring, and that would need to be done in a downstream system.

O'Neal then walked through some of the details of the ESG field test participant responses organized by topic. Chang asked how the equity scenario subsets were selected as part of the field test. O'Neal noted that each scenario could be thought of as a set of U.S. Treasury, corporate bond fund, and equity fund returns. He said as part of the subset selection methodology used for the field test, only the returns of the U.S. Treasury scenarios were considered; thus, the scenario subsets could be thought of as being representative of the full set only with respect to interest rate risk. He further stated that two full scenario sets with the same equity scenarios but different U.S. Treasury scenarios would end up with different equity scenario subsets due to the scenario subset selection methodology.

O'Neal noted that some of the next steps on the NAIC's ESG project would include following up with participants with questions, confirming compiled results with participants, and continuing to compile the quantitative results. He noted that initial meetings where ESG field test results will be shared would focus on VM-21, followed by VM-20 and C3 Phase I. He also mentioned that meetings of the newly formed ESG drafting groups would begin early in 2023. Finally, he stated that given the amount of work needed to be completed before the ESG is adopted, along with the need for a second field test, the ESG is expected to be implemented no earlier than 2025.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/Fall Natl Meeting/Minutes Packet/LATF Fall National Meeting Minutes.docx



Draft: 11/28/22

Life Actuarial (A) Task Force  
Virtual Meeting  
November 17, 2022

The Life Actuarial (A) Task Force met Nov. 17, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil and Elaine Lam (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); Jon Pike represented by Tomasz Serbinowski (UT); and Allan L. McVey represented by Tim Sigman (WV).

1. Exposed a Referral from the Financial Regulation Standards and Accreditation (F) Committee on Model #822

Becky Meyer (NAIC) noted that the NAIC's accreditation standards require states to adopt certain laws and regulations. She said that with the revisions to the *Standard Valuation Law* (#820) for principle-based reserving (PBR), the Financial Regulation Standards and Accreditation (F) Committee is questioning whether an accreditation standard is still needed for the *Actuarial Opinion and Memorandum Regulation* (#822). Meyer noted that after an initial review, it appears that the requirements related to Model #822 significantly overlap with the requirements laid out in the *Valuation Manual*. Meyer noted that the Committee is asking whether the Task Force could review the requirements of the *Valuation Manual* and provide a recommendation regarding whether the requirements in Model #822 are redundant and, therefore, are no longer needed as an accreditation standard in their referral letter (Attachment One-A).

Hemphill noted that on an initial read of the requirements, it does seem like #822 is duplicative. Hemphill elected to expose the referral from the Committee for 21-day public comment period ending Dec. 7.

2. Exposed an NAIC Staff Memorandum on Negative IMR Guidance in VM-20, VM-21, and VM-30

Scott O'Neal (NAIC) said that in the rapidly rising interest rate environment, some life insurance and annuity companies are seeing their interest maintenance reserve (IMR) balances decrease or even become negative. He noted under current statutory accounting guidance, a negative IMR is a non-admitted asset. He said that the Statutory Accounting Principles (E) Working Group had received a letter from the American Council of Life Insurers (ACLI) regarding this issue with negative IMR and the potential for the double counting of losses through the disallowance of negative IMR on the balance sheet and a related reserve deficiency caused by allocating negative IMR in VM-20, Requirements for Principle-Based Reserves for Life Products; VM-21, Requirements for Principle-Based Reserves for Variable Annuities; and VM-30, Actuarial Opinion and Memorandum Requirements. He said that NAIC staff had prepared a memorandum (Attachment One-B) with temporary 2022 year-end guidance for companies to handle negative IMR in a reasonable and principle-based fashion and, therefore, not allocate any non-admitted portion of IMR for purposes of VM-20, VM-21, and VM-30. However, he noted that if a company was granted a permitted practice to admit the formerly non-admitted negative IMR, the company then should allocate the formerly non-admitted portion of negative IMR again as a reasonable and principle-based approach.

Tsang asked if the Task Force was considering admitting the negative IMR as an asset and changing the annual statement instructions. Hemphill noted that any change to admitting negative IMR as an asset would need to be considered by the Working Group and that it was unlikely that the Working Group could make such a sweeping change to accounting standards this late in the year. The Task Force then discussed the technical details of the guidance in the NAIC staff memorandum. Carmello noted that the *Valuation Manual* reserving requirements are not perfectly clear regarding the handling of negative IMR, and the NAIC staff memorandum seeks to clarify the handling for year-end 2022 before potential further action can be taken by the Working Group. Paul Graham (ACLI) noted that he would like a change to the guidance to not just refer to any potential permitted practices that are granted, but also any potential guidance from the Working Group that could allow negative IMR to be admitted. Carmello noted that he expects the Working Group to coordinate with the Task Force on any action related to IMR and that the guidance could be updated at that time.

Graham then asked how companies would be notified of the guidance in the NAIC staff memorandum. Hemphill noted that once adopted by the Task Force, the NAIC would send the memorandum to the chief financial examiners of each NAIC jurisdiction along with the Working Group. She noted that the Task Force would take comments on how the memorandum should be distributed during a potential exposure of the memorandum.

Andersen made a motion, seconded by Carmello, to expose the NAIC staff memorandum for a two-week public comment period ending Nov. 30. The motion passed unanimously.

### 3. Exposed an NAIC Staff Recommendation Memorandum for LIBOR Replacement

Pat Allison (NAIC) noted that the purpose of the NAIC staff memorandum was to recommend a replacement for the London Interbank Offered Rate (LIBOR) for use in 2022 year-end reporting and going forward. Allison said that language in the *Valuation Manual* specified that the replacement for LIBOR, the Secured Overnight Financing Rate (SOFR), would become effective once the Task Force adopts the NAIC staff memorandum. Allison went on to discuss the technical details of the NAIC Staff memorandum on the replacement for LIBOR. Alan Routhenstein (American Academy of Actuaries—Academy) then discussed the Academy's comment letter that supported the NAIC's memorandum, including the justification for the effective date of Dec. 30, 2022.

Weber made a motion, seconded by Yanacheak, to expose both the NAIC staff memorandum (Attachment One-C) and the Academy comment letter (Attachment One-D) for a two week public comment period ending Nov. 30. The motion passed unanimously.

### 4. Discussed a Plan for IUL Illustration (A) Subgroup Discussion at the Fall National Meeting

Andersen noted that the Task Force had provided direction for a project to consider improvements to indexed universal life (IUL) illustrations in two phases: 1) a quick fix to address the immediate concern with companies illustrating non-benchmark indices higher than benchmark indices; and 2) develop a potential recommendation to partially open up the *Life Insurance Illustrations Model Regulation* (#582) to more comprehensively address the IUL illustration issues. Andersen recommended that in addition to discussions of the two phases, the Task Force consider the potential for a third phase of the project, which would consider recommendations to the Life Insurance and Annuities (A) Committee to more broadly address issues with life illustrations.

### 5. Exposed the AG ILVA Draft

Weber noted that the Index-linked Variable Annuity Actuarial Guideline Draft (AG ILVA Draft) (Attachment One-E) had been updated to reflect more of a middle-ground regarding the question of whether to require a market value adjustment (MVA). He said that the new AG ILVA Draft allows states more discretion to consider the value

of supporting assets and whether a market value adjustment is appropriate to define the interim nonforfeiture values. Leung said that he would like the drafting note to be reworded to note that a state may want to consider whether excluding an MVA is appropriate. Slutsker and Eom noted support for Leung's suggested edit for the AG ILVA Draft.

Kirk Evans (Sammons Financial) said that he viewed the index strategies offered in ILVA products as similar to investments known as structured notes that are available on the capital markets. He said that the language in the AG ILVA Draft should make it clear that given this similarity, the interim values could be valued consistently with how they are valued on the capital markets through a fair value approach. Eom agreed that the language could be added to the AG ILVA Draft to make it clearer that a fair value approach was appropriate.

Birny Birnbaum (Center for Economic Justice—CEJ) asked whether different policy forms would be required across different states, as under the AG ILVA Draft one state could require an MVA whereas another could allow for an MVA to be excluded. Weber noted that he anticipates the Interstate Insurance Product Regulation Commission (Compact) would likely work on setting standards for these products so that their issue could be more uniform across states.

Weber made a motion, seconded by Yanacheak, to expose the AG ILVA Draft with modifications to incorporate the edits suggested by Leung and Evans. The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

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**MEMORANDUM**

**TO:** Life Actuarial (A) Task Force

**FROM:** Director Lori K. Wing-Heier, Chair of the Financial Regulation Standards and Accreditation (F) Committee

**DATE:** October 13, 2022

**RE:** Re-evaluation of Model #822 as an Accreditation Standard

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Both the *Standard Valuation Law* (#820), and the *Actuarial Opinion and Memorandum Regulation* (#822), which set forth requirements for statements of actuarial opinion, the appointed actuary, and adequacy of reserves, are part of the NAIC Accreditation Standards (the Standards) that each jurisdiction must adopt to be accredited. In 2020, substantial revisions to Model #820 became effective for accreditation. The required revisions include use of the *Valuation Manual*, which contains VM-30, "Actuarial Opinion and Memorandum Requirements."

There is overlap between the *Valuation Manual* and Model #822 and the question is raised whether Model #822 is still necessary to require as part of the Standards. The Standards operate as a minimum baseline and generally do not restrict the ability of a state to have additional laws or regulations that do not conflict with the Standard. Therefore removing #822 as a Standard would not require states to repeal the regulation, rather it would allow states to choose to repeal if deemed appropriate in their state.

The Committee requests that the Life Actuarial (A) Task Force review the Standard for Model #822 and the requirements in the *Valuation Manual* to determine if the *Valuation Manual* meets the necessary actuarial requirements and Model #822 can be removed from the Standards. The complete Liabilities and Reserves accreditation standard is attached for reference, with references to Model #822 highlighted for your review.

The Committee appreciates the Task Force's assistance on this issue and looks forward to the response.

**9. Liabilities and Reserves**

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State statute should prescribe minimum standards for the establishment of liabilities and reserves resulting from insurance contracts issued by an insurer; including life reserves, active life reserves and unearned premium reserves, and liabilities for claims and losses unpaid and incurred but not reported claims. The NAIC’s *Standard Valuation Law* (#820), *Actuarial Opinion and Memorandum Regulation* (#822) and *Property and Casualty Actuarial Opinion Model Law* (#745) or substantially similar provisions shall be in place.

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**REFERENCE**

a. Prescribe minimum standards for establishment of:

- Life reserves?
- Active life reserves?
- Unearned premium reserves?
- Claims liabilities?
- Loss reserves?

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*Standard Valuation Law* (#820)

b. The following definitions under Section 1B apply on or after the operative date of the *Valuation Manual*: appointed actuary; company; policyholder behavior; principle-based valuation; qualified actuary; and *Valuation Manual*?

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c. Policies and contracts issued prior to the operative date of the *Valuation Manual* are annually valued in accordance with Section 2A?

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d. Policies and contracts issued on or after the operative date of the *Valuation Manual* are annually valued in accordance with Section 2B?

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e. Prior to the operative date of the *Valuation Manual*, every life insurance company doing business in this state shall annually submit an actuarial opinion on reserves in accordance with Section 3A?

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f. After the operative date of the *Valuation Manual*, every company with outstanding life insurance contracts, accident and health insurance contracts, or deposit-type contracts in this state shall annually submit the opinion of a qualified actuary in accordance with Section 3B(1)?

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g. After the operative date of the *Valuation Manual*, every company with outstanding life insurance contracts, accident and health insurance contracts, or deposit-type contracts in this state, except as exempted by the *Valuation Manual*, shall annually submit an opinion of the qualified actuary with respect to the Actuarial Analysis of Reserves and Assets Supporting Reserves in accordance with Section 3B(2)?

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h. After the operative date of the *Valuation Manual*, a memorandum in form and substance acceptable to the commissioner shall be prepared to support each actuarial opinion in accordance with Section 3B(3)(a)?

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i. After the operative date of the *Valuation Manual*, the commissioner may engage a qualified actuary at the expense of the company to review the opinion and the basis for the opinion and prepare the supporting memorandum required by the commissioner in accordance with Section 3B(3)(b)?

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j. Every opinion after the operative date of the *Valuation Manual* shall be governed by the requirements of the provisions of Section 3B(4)(a) through Section 3B(4)(d)?

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k. Prescribe computation of minimum standard for reserves similar to Section 4?

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l. With respect to accident and health insurance contracts issued on or after the operative date of the *Valuation Manual*, the standard prescribed in the *Valuation Manual* is the minimum standard of valuation required in accordance with Section 10?

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m. The *Valuation Manual* should be adopted by the states uniformly, utilizing the version effective Jan. 1, 2017, and all subsequent revisions adopted by the NAIC membership (including any provisions with respect to fraternal benefit societies). For policies issued on or after the operative date of the *Valuation Manual*, the standard prescribed in the *Valuation Manual* is the minimum standard of valuation in accordance with Section 11A?

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n. Any changes to the *Valuation Manual* are made in accordance with Section 11C?

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o. The *Valuation Manual* is required to specify all the requirements described in Section 11D?

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*Property and Casualty Actuarial Opinion Model Law (#745)*

bb. Requires annual submission of a Statement of Actuarial Opinion similar to Section 2A of the model?

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cc. Requires annual submission of an Actuarial Opinion Summary similar to Section 2B of the model?

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dd. Requires that the Statement of Actuarial Opinion is provided with the Annual Statement and is treated as a public document similar to Section 3A of the model?

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ee. Includes requirements that various documents related to the Actuarial Report or Actuarial Opinion Summary are confidential by law and privileged similar to Section 3B(1) of the model?

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November 17, 2022

**To:** Members of the Life Actuarial (A) Task Force

**From:** NAIC Staff

**RE:** Guidance on Allocating Negative IMR (PIMR) In VM-20, VM-21, and VM-30

### **Executive Summary**

With the rapidly rising interest rate environment, companies selling fixed income assets for a loss are seeing their Interest Maintenance Reserve (IMR) balances decrease or even become negative. Current statutory accounting treatment makes negative IMR a non-admitted. While a longer-term evaluation of IMR is being considered by the Statutory Accounting Practices (E) Working Group (SAPWG), additional guidance on the proper practice for allocating IMR for Asset Adequacy Testing and Principle-based Reserving purposes may be helpful for companies in the near term.

### **Background**

The letter to SAPWG from the American Council of Life Insurers (ACLI) (Attachment 1) notes that "...with the inclusion of a negative IMR balance in asset adequacy testing, the disallowance of a negative IMR can result in double counting of losses (i.e., through the disallowance on the balance sheet and the potential AAT-related reserve deficiency)." There are several sections of the Valuation Manual and RBC instructions where IMR is referenced in the letter. Some of these references contemplate allocating negative IMR (or pre-tax IMR (PIMR), as applicable) at the level of business that is being analyzed/reserved for. However, these references do not detail what to do when the total company IMR balance is negative – and therefore a non-admitted asset under current statutory guidance.

Other references do provide additional insight as to the allocation of IMR when the total company balance is negative/disallowable. VM-20 Section 7.D.7.b notes that "...the company shall use a reasonable approach to allocate any portion of the total company balance that is disallowable under statutory accounting procedures (i.e., when the total company balance is an asset rather than a liability)." Question 22 of the AAA's Asset Adequacy Practice Note (Attachment 2) states that "... a negative IMR is not an admitted asset in the annual statement. So, some actuaries do not reflect a negative value of IMR in the liabilities used for asset adequacy analysis." However, Question 22 also notes a 2012 survey data that showed varying practices across companies, including some companies that allocated negative IMR.

### **Recommendation**

In order to assist state regulators in achieving uniform outcomes for year-end 2022, we have the following recommendation: the allocation of IMR in VM-20, VM-21, and VM-30 should be principle-based, "appropriate", and "reasonable". Companies are not required to allocate any non-admitted portion of IMR (or PIMR, as applicable) for purposes of VM-20, VM-21, and VM-30, as being consistent with the asset handling for the non-admitted portion of IMR would be part of a principle-based, reasonable and appropriate allocation. However, if a company was granted a permitted practice to admit negative IMR as an asset, the company should allocate the formerly non-admitted portion of negative IMR, as again a principle-based, reasonable and appropriate IMR allocation would be consistent with the handling of the IMR asset. This recommended guidance is for year-end 2022, to address the current uncertainty and concerns with the "double-counting" of losses. This recommended guidance will help ensure consistency between states and between life insurers in this volatile rate environment. Refinement of this guidance may be considered beyond year-end 2022.

# Attachment 1



**Mike Monahan**

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**Paul Graham**

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October 31, 2022

Mr. Dale Bruggeman, Chairman  
Statutory Accounting Principles Working Group  
National Association of Insurance Commissioners  
1100 Walnut Street, Suite 1500  
Kansas City, MO 64106-2197

Dear Mr. Bruggeman:

**Re: Proposal for the NAIC to Fulfil the Original Intent of the Interest Maintenance Reserve**

The American Council of Life Insurers (ACLI) would like to request urgent action on an issue that was never fully resolved by the NAIC and has become a pressing matter for the industry due to the rapid rise in interest rates – the allowance of a net negative Interest Maintenance Reserve (IMR) balance.

The ACLI proposes the allowance of a negative IMR balance in statutory accounting. Negative IMR balances are expected to become more prevalent in a higher interest rate environment and their continued disallowance will only serve to project misleading optics on insurers' financial strength (e.g. inappropriate perception of decreased financial strength through lower surplus and risk-based capital even though higher rates are favorable to an insurer's financial health) while creating uneconomic incentives for asset-liability management (e.g. discourage prudent investment transactions that are necessary to avoid mismatches between assets and liabilities just to avoid negative IMR).

ACLI believes the necessary changes can be implemented quickly and with minimal changes to the annual statement reporting instructions.

American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

[acli.com](http://acli.com)

The remainder of this letter expands upon these points.

### **Historical Context and Background**

The IMR, first effective in statutory accounting in 1992, requires that a realized fixed income gain or loss, attributable to changes in interest rates (but not gains or losses that are credit related), be amortized into income over the remaining term to maturity of the fixed income investments (and related hedging programs) sold rather than being reflected in income immediately.

Since statutory accounting practices for life insurance companies are the primary determinant of obtaining an accurate picture for assessing solvency, it was imperative that the accounting practices be consistent for assets, liabilities, and income and that they be reported on a financially consistent basis. If assets and liabilities were not reported on a financially consistent basis, then the financial statements would not be useful in determining an accurate assessment of solvency or whether there were sufficient assets to pay contractual obligations when they become due.

Amortized cost valuation of fixed income investments reflects the outlook at the time of purchase and amortization reflects the yields available at time of purchase. Policy reserve liabilities are established at the same time, and the interest rate assumptions are consistent with the yields at that time. But if fixed income investments are sold, with the proceeds reinvested in new fixed income investments, a new amortization schedule is established which may be based on an entirely different yield environment, which may be inconsistent with the reserve liabilities when they were established.

IMR was created to prevent the timing of the realization of gains or losses on fixed income investments, related to interest rates changes, to affect the immediate financial performance of the insurance company. This recognized that the gains and losses were transitory without any true economic substance since the proceeds would be reinvested at offsetting lower or higher interest rates.

For example, without the IMR, if a company sold all bonds in a declining interest environment (e.g., from 4% to 2%), and reinvested in new bonds, surplus would increase through significant realized gains. The increased surplus would inappropriately reflect increased financial strength that is illusory, due to a now lower yielding portfolio, as there would be no change to the income needed to support the liabilities.

Likewise, if a company sold all bonds in an increasing interest rate environment (e.g., from 2% to 4%), and reinvested in new bonds, surplus would decrease through significant realized losses. The decreased surplus would inappropriately reflect decreased financial strength that is similarly illusory due to the reinvestment at higher yields relative to when the bonds were originally purchased.

A net negative IMR is currently disallowed in statutory accounting. This handling is contrary to its original intent which recognized that interest related gains and losses are both transitory without any true economic substance since the proceeds would be reinvested at offsetting lower or higher interest rates, respectively. See attachment I to this letter that illustrates the financially consistent

treatment of assets, liabilities, and income and how IMR is needed to achieve that objective for both realized gains and losses.

That IMR should conceptually apply to both realized gains and losses was recognized by the NAIC during and after IMR development. The below is a quote from a 2002 report by the NAIC AVR/IMR Working Group to the E-Committee:

*“The basic rationale for the IMR would conclude that neither a maximum nor a minimum is appropriate. If the liability values are based on the assumption that the assets were purchased at about the same time as the liabilities were established, then there should be no bounds to the reserve which corrects for departures from that assumption; **if a company has to set up a large reserve because of trading gains, it is in no worse position that if it had held the original assets. As for negative values of the IMR, the same rationale applies. However, the concept of a negative reserve in the aggregate has not been adopted.**”*

While realized losses can offset realized gains in IMR, the IMR instructions require the disallowance of a net negative IMR balance (e.g., as noted in the last sentence of the aforementioned quote). See attachment II to this letter, which includes the pertinent IMR instructions where negative IMR balances are currently disallowed and in need of amendment.

When IMR was originally developed, it was intended to achieve its purpose in both a declining and rising interest rate environment. The originally adopted disallowed status of a negative IMR was expected to be addressed in subsequent years. However, over time with the persistent declining interest rates, the issue lost urgency since a negative IMR would not have been a significant issue for any company. The NAIC AVR/IMR Working Group ultimately disbanded without ever addressing this longstanding item on their agenda.

With a rising interest rate environment, it is important that the allowance of a negative IMR be addressed to fulfill its original purpose. In general, rising interest rates are favorable to the financial health of the insurance industry as well as for policyowners.

Without a change, the rising interest rate environment will give the inappropriate perception of decreased financial strength through lower surplus and risk-based capital and worse, create incentives for insurance companies to take action, or not take actions, to prevent uneconomic surplus impacts where the actions (or lack thereof) themselves may be economically detrimental.

Symmetrical treatment of a negative IMR (i.e., the allowance of a negative IMR balance) would appropriately not change surplus as a sale and reinvestment would not affect the underlying insurance company liquidity, solvency, or claims paying ability, just like with a positive IMR. See attachment III to this letter that illustrates that the sale of a fixed income investment, and reinvestment in a new fixed income investment, has no bearing on a life insurance company's liquidity, solvency, or claims paying ability.

As it was initially recognized by the NAIC that IMR should apply to both gains and losses, adequate safeguards were already built into the IMR instructions for asset adequacy, risk-based capital, and troubled companies.

#### **Negative IMR – Reserve Adequacy and Risk-Based Capital**

When IMR was developed, it was anticipated that a negative IMR balance would be reflected in asset adequacy analysis. This inclusion ensures that the assets, with the appropriate allocation from the IMR (whether negative or positive), would be adequate to fund future benefit obligations and related expenses of the company.

From the standpoint of reserve adequacy, the inclusion of a negative IMR balance appropriately reduces the investment income in asset adequacy testing. Without the inclusion of negative IMR, reserve inadequacies would potentially not be recognized.

Further, with the inclusion of a negative IMR balance in asset adequacy testing, the disallowance of a negative IMR can result in double counting of losses (i.e., through the disallowance on the balance sheet and the potential AAT-related reserve deficiency). The Actuarial Opinion that covers asset adequacy analysis requires the appropriate assessment of negative IMR in its analysis.

If a negative IMR balance is used in the asset adequacy analysis, its allowance is appropriate. Likewise, if only a portion of a company's negative IMR balance is reflected in the asset adequacy analysis, only the allowance for that portion of the negative IMR balance reflected is appropriate. If a negative IMR balance is disallowed, it would be inappropriate to include in asset adequacy analysis. It is imperative there is symmetry between both reserving and accounting considerations, and there is already precedent in the asset adequacy analyses for inclusion of IMR.

Below are the current references to IMR in the valuation manual and risk-based capital calculations.

Regulation	Use	IMR references
Actuarial Opinion and Memorandum Regulation (VM-30)	Asset adequacy analysis for annual reserve opinion	An appropriate allocation of assets in the amount of the IMR, whether positive or negative, shall be used in any asset adequacy analysis.
Life principle-based reserves (VM-20)	Calculation of deterministic reserve	Calculate the deterministic reserve equal to the actuarial present value of benefits, expenses, and related amounts less the actuarial present value of premiums and related amounts, less the positive or negative pre-tax IMR balance at the valuation date allocated to the group of one or more policies being modeled
Life principle-based reserves (VM-20)	Calculation of stochastic reserve	Add the CTE amount (D) plus any additional amount (E) less the positive or negative pre-tax IMR balance allocated to the group of one or more policies being modeled
Variable annuities principle-based reserves (VM-21)	Reserving for variable annuities	The IMR shall be handled consistently with the treatment in the company's cash-flow testing, and the amounts should be adjusted to a pre-tax basis.
C3 Phase 1 (Interest rate risk capital)	RBC for fixed annuities and single premium life	IMR assets should be used for C3 modeling.

### **Additional IMR Safeguards**

The IMR instructions do provide additional safeguards in situations where it would be appropriate to recognize interest-rate related gains and losses immediately rather than be included in the IMR.

They were established to prevent situations where the liability the IMR supports, no longer exists. Examples noted in the annual statement instructions include:

- Major book-value withdrawals or increases in policy loans occurring at a time of elevated interest rates.
- Major book value withdrawals resulting from a “run on the bank” due to adverse publicity.

As a result, the IMR instructions include an IMR Exclusion whereby all gains or losses which arise from the sale of investments related to “Excess Withdrawal Activity” are to be excluded from IMR and reflected in net income. In short, Excess Withdrawal Activity is defined as 150% of the product of the lower of the withdrawal rate in the preceding or in the next preceding year calendar year times the withdrawal reserves at the beginning of the year.

### **Summary**

With a rising interest rate environment, it is important that the allowance of a negative IMR be addressed to fulfill its original purpose. In general, rising interest rates are favorable to the financial health of the insurance industry as well as for policyowners. Without a change, the rising interest rate environment will give the inappropriate perception of decreased financial strength through lower surplus and risk-based capital.

The inability to recognize negative IMR could also impact the rating agency view of the industry, or worse, incentivize companies to avoid prudent investment transactions that are necessary to avoid mismatches between assets and liabilities. Furthermore, there are adequate safeguards in place to ensure that allowing a negative IMR does not cause any unrecognized reserve or capital inadequacies or any overstatement of claims paying ability.

Current statutory accounting guidance creates two equally objectionable alternatives for insurers and their policyowners. Following the current statutory guidance will improperly reflect financial strength through understating surplus, so additional surplus may need to be retained. Alternatively, one could take steps to manage the current situation by limiting trading of fixed income investments and related hedging programs, which would diminish significant economic value for policyowners, as well as create a mismatch between assets and liabilities.

Both scenarios encourage short-term non-economic activity not in the best long-term interest of the insurance company’s financial health or its policyowners. For insurers with diminishing IMR balances due to the rapid increase in interest rates, this dilemma is either here or fast approaching and can only be resolved now with certainty of the appropriate treatment of IMR by the NAIC.

The ACLI looks forward to urgently working with the NAIC toward fulfilling the original intent of IMR. It is imperative that insurers receive relief for year-end 2022.

If you have any questions regarding this letter, please do not hesitate to contact us.

Sincerely,

A handwritten signature in cursive script that reads "Mike Monahan".

Mike Monahan  
Senior Director, Accounting Policy

A handwritten signature in cursive script that reads "Paul A. Graham" followed by a stylized monogram.

Paul Graham  
Senior Vice President, Chief Actuary



Attachment I

**Simplified Example – Need for Reporting Assets, Liabilities, and Income on a Consistent Basis:**

- This example shows the appropriate interrelationship of IMR on assets, reserve liabilities, and income.
- Assume a bond is held with the following characteristics:
  - Par Value: \$1,000
  - Coupon: 3%
  - Term-to-maturity: 10 years
- Assume the bond is then sold at “time zero” and the proceeds are immediately reinvested in a bond with the same characteristics (e.g., term-to maturity, credit quality, coupon equivalent to market rate, etc.).
- Assume a simplified example with no existing IMR balance, where the bond supports a fixed insurance liability with the same duration as the original bond, as well as a present value of \$1,000.

Table 1: Market Interest Rate Scenario			
	Same	Lower	Higher
Market interest rate	3%	2%	4%
Bond’s market value	\$1,000	\$1,090	\$919
Realized gain/(loss) if sold	\$0	\$90	(\$81)*

Realized gain/(loss) deferred to balance sheet IMR and amortized into income over remaining life of bond sold (i.e., 10 years).

Table 2: Statutory Investment Income			
IMR amortization	\$0	\$9	(\$8)
Interest income on new bond	\$30	\$21	\$38
Total annual stat income	\$30	\$30	\$30

On average, future income is approximately the same in each interest rate scenario as the IMR gets reduced through amortization to income.

Table 3: Statutory Balance Sheet			
Balance Sheet Bonds	\$1,000	\$1,090	\$919
IMR	\$0	(\$90)	\$0*
Stat assets net of IMR	\$1,000	\$1,000	\$919*
Reserves	\$1,000	\$1,000	\$1,000
Surplus	\$0	\$0	(\$81)*

Even though the sale of the bond (and subsequent reinvestment) is non-economic, and the same income is being produced to support the liability, a negative surplus position makes it appear there is now a deficiency. Allowing the negative IMR appropriately would show no surplus impact, as is shown when a gain occurs, as there is no change in reported reserve liabilities. Appropriately consistent financial results require the allowance of negative IMR

**\*The negative IMR balance is currently disallowed and directly reduces surplus. This treatment is not supported by theoretical rationale and gives a distorted view of solvency.**

**Attachment II**

**Pertinent Annual Statement Instructions**

Line 6 – Reserve as of December 31, Current Year

Record any positive or allowable negative balance in the liability line captioned “Interest Maintenance Reserve” on Page 3, Line 9.4 of the General Account Statement and Line 3 of the Separate Accounts Statement. A negative IMR balance may be recorded as a negative liability in either the General Account or the Separate Accounts Statement of a company only to the extent that it is covered or offset by a positive IMR liability in the other statement.

If there is any disallowed negative IMR balance in the General Account Statement, include the change in the disallowed portion in Page 4, Line 41 so that the change will be appropriately charged or credited to the Capital and Surplus Account on Page 4. If there is any disallowed negative IMR balance in the Separate Accounts Statement, determine the change in the disallowed portion (prior year less current year disallowed portions), and make a direct charge or credit to the surplus account for the “Change in Disallowed Interest Maintenance Reserve” in the write-in line, in the Surplus Account on Page 4 of the Separate Accounts Statement.

The following information is presented to assist in determining the proper accounting:

General Account IMR Balance	Separate Account IMR Balance	Net IMR Balance
Positive	Positive	Positive (see rule a)
Negative	Negative	Negative (see rule b)
Positive	Negative	Positive (see rule c)
Positive	Negative	Negative (see rule d)
Negative	Positive	Positive (see rule e)
Negative	Positive	Negative (see rule f)

Rules:

- a. If both balances are positive, then report each as a liability in its respective statement.
- b. If both balances are negative, then no portion of the negative balances is allowable as a negative liability in either statement. Report a zero for the IMR liability in each statement and follow the above instructions for handling disallowed negative IMR balances in each statement.
- c. If the general account balance is positive, the separate accounts balance is negative and the combined net balance is positive, then all of the negative IMR balance is allowable as a negative liability in the Separate Accounts Statement.
- d. If the general account balance is positive, the separate account balance is negative, and the combined net balance is negative, then the negative amount not covered by the positive amount is not allowable. Report only the allowable portion as a negative liability in the Separate Accounts Statement and follow the above instructions for handling the disallowed portion of negative IMR balances in the Separate Accounts Statement.
- e. If the general account balance is negative, the separate account balance is positive, and the combined net balance is positive, then all of the negative IMR balance is allowable as a negative liability in the General Account Statement.
- f. If the general account balance is negative, the separate account balance is positive, and the combined net balance is negative, then the negative amount not covered by the positive amount is not allowable. Report only the allowable portion as a negative liability in the General Account Statement and follow the above instructions for handling the disallowed portion of negative IMR balances in the General Account Statement.

Attachment III

IMR Illustration – Liquidity, Solvency and Claims Paying Ability

Essentially, a negative IMR balance from an individual trade represents the present value of the future positive interest rate differential, from the new investment compared to the old investment, that puts one in the same economic position, when compared to before the trade, including total liquid assets available to pay claims.

This phenomenon can be illustrated in the following table where a 10-year bond is sold, one year after purchase, and immediately reinvested in another 10-year bond with equivalent credit quality in an interest rate environment where market interest rates increased from 2% to 4% in the intervening year.

	Coupon Rate of Bond	Market Interest Rate @ Purchase	Par Value of Bond	Fair Value @ Purchase	Fair Value @ Time of Sale	Loss on Sale	Claims Paying Liquidity
Old Bond	2%	2%	100	100	85.13	14.87	85.13
New Bond	4%	4%	85.13	85.13	85.13	N/A	85.13

The short-term acceleration of negative IMR to surplus (e.g., its disallowance) is strictly a timing issue and not a true loss of financial strength or claims paying liquidity, but it does present a temporary and inappropriate optics issue in surplus/financial strength until the IMR is fully amortized.

This phenomenon can further be illustrated by comparing two separate hypothetical companies. Assume Company A and B both have the exact same balance sheets. Then assume Company A keeps the old bond and Company B affects the trade mentioned above.

With the disallowance of a negative IMR balance, Company B now has a balance sheet that shows a relative decline of financial strength of \$14.87. This weakened balance sheet contrasts with both the principle behind the development of IMR, the relative actual economic financial strength, and claims paying ability of the two entities.

There is no difference in balance sheet economics of the two entities. The negative IMR balance for Company B essentially represents the difference between cost and fair value of the investment sold, that is already embedded on Company A's balance sheet based on the existing interest rate environment. The negative IMR balance should be recognized as there is no change in economics pre and post trade (or in this instance between Company A and Company B) which is consistent with the overall principle behind IMR.

# Attachment 2

## A PUBLIC POLICY PRACTICE NOTE

# Asset Adequacy Analysis

September 2017

Developed by the Asset Adequacy Analysis Practice Note Work Group  
of the American Academy of Actuaries



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A PUBLIC POLICY PRACTICE NOTE

# Asset Adequacy Analysis

*September 2017*

Developed by the Asset Adequacy Analysis  
Practice Note Work Group  
of the American Academy of Actuaries



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The American Academy of Actuaries is a 19,000-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

## ASSET ADEQUACY ANALYSIS PRACTICE NOTE

This practice note is not a promulgation of the Actuarial Standards Board, is not an actuarial standard of practice (ASOP), is not binding upon any actuary and is not a definitive statement as to what constitutes generally accepted practice in the area under discussion. Events occurring subsequent to this publication of the practice note may make the practices described in this practice note irrelevant or obsolete.

This practice note was prepared by a work group organized by the Life Valuation Committee of the American Academy of Actuaries (Academy). The work group was charged with updating the 2004 practice note (which itself replaced the original 1995 practice note) regarding asset adequacy analysis practices used by appointed actuaries in the United States.

The practice note represents a description of practices believed by the work group to be commonly employed by actuaries in the United States. The purpose of the practice note is to assist actuaries who are faced with the requirement of asset adequacy analysis by supplying examples of some of the common approaches to this work. In addition, references have been made to other relevant and readily available literature. However, no representation of completeness is made, nor is there an assertion as to whether the practices discussed herein constitute best practice; other approaches may also be in common use.

This practice note reflects the results of a survey of actuaries who practice in jurisdictions in which the model Standard Valuation Law (SVL) of the National Association of Insurance Commissioners (NAIC) applies. To the extent that the laws of a particular state differ from the NAIC model, practices described in this practice note may not be appropriate for actuarial practice in that state.

Comments are welcome as to the appropriateness of this practice note, desirability of periodic updating, validity of substantive disagreements, etc. Comments should be sent to [lifepolicyanalyst@actuary.org](mailto:lifepolicyanalyst@actuary.org).

ASSET ADEQUACY ANALYSIS PRACTICE NOTE

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**ASSET ADEQUACY ANALYSIS PRACTICE NOTE**

## **Section A: Introduction and Background**

### **Q1. What current practices are the basis of this practice note?**

Starting in 1986, actuaries have been performing asset adequacy analysis for certain annuity and other interest-rate-sensitive lines of business under the requirements of New York Regulation 126. The types of business subject to asset adequacy analysis expanded into all other product lines because of the adoption of the Actuarial Opinion and Memorandum Regulation (AOMR) and the release of several Actuarial Guidelines requiring stand-alone asset adequacy analysis. Many practices have been developed in response to these regulations and guidelines.

To better understand current practice, the Society of Actuaries Smaller Insurance Company section sponsored a survey in 2012 (in a manner similar to the survey referenced in the 2004 version of this practice note) on the practices followed by appointed actuaries. These survey results are incorporated into this practice note. Below is a breakdown of the survey respondents by company size (level of reserves):

<b>Level of Reserves</b>	<b>Responses</b>	<b>% of Total</b>
More than \$25B	24	13%
\$10B–\$25B	17	9%
\$5B–\$10B	16	9%
\$1B–\$5B	39	21%
Less than \$1B	88	48%
TOTAL	184	100%

It should be noted that, where appropriate, we have used certain results from the 2004 survey.

### **Q2. Is this practice note expected to become a standard that actuaries must follow?**

No. This practice note documents what is understood to be current practice at the time of publication and is based upon the knowledge gained from surveys and supplemental discussions held by members of the work group. It is a reference guide to aid appointed actuaries and other members of the Academy. The work group assumes no responsibility for any action taken as a result of using the information contained in this practice note.

There are several reasons why an actuary could elect to use methods other than those documented within this practice note, including:

- The actuary could be aware of special circumstances pertaining to a particular company or block of business that warrant the use of other methods.

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- The economic conditions that exist at the time the actuarial opinion is to be made may warrant practices and/or methodologies not contemplated in this note.
- The actuary may have developed other acceptable testing methods.
- While the practice note was prepared and reviewed by actuaries familiar with the topic of the practice note, and these actuaries have concluded that the practice note represents approaches that fall within current practice, other approaches that could properly be termed “current practices” may not be documented here.

#### **Q3. What is the goal of asset adequacy analysis?**

The goal of asset adequacy analysis is to ascertain the ability of a block of assets to support a corresponding block of liabilities, taking into account the cash flows associated with the assets and liabilities, as well as interactions among the cash flows (e.g., asset returns may impact liability crediting rates).

Some actuaries may view the value of asset adequacy analysis to be limited to the satisfaction of regulatory requirements. Other actuaries may value asset adequacy analysis additionally for its ability to inform management of actual or possible problems that may arise due to the underlying characteristics or current management of the business. In fact, many regulators take a keen interest in how the asset adequacy results are communicated to management. The regulatory asset adequacy issues summary (RAAIS)—refer to Q102—is used by some actuaries for communication with management as well as regulators.

There are a number of regulations and guidelines that require asset adequacy analysis, including but not limited to:

- 2001 Actuarial Opinion and Memorandum Regulation (2001 AOMR)
- Valuation of Life Insurance Policies Model Regulation
- New York Regulation 126
- 2001 CSO Model Regulation
- Actuarial Guideline XXXVIII (Application of the Valuation of Life Insurance Policies Model Regulation)
- Actuarial Guideline XLIII for Variable Annuities (AG43)

#### **Q4. How is an asset (reserve) adequacy analysis different from a solvency test?**

The 2001 AOMR (Section 6B(6)) asks an actuary to opine, in certain circumstances, that

the reserves and related items, when considered in light of the assets held by the company with respect to such reserves and related actuarial items ... make adequate provision, according to presently accepted actuarial standards of practice,

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for the anticipated cash flows required by the contractual obligations and related expenses of the company.

Thus, the 2001 AOMR opinion is an opinion related to the ability of the assets backing reserves to meet policyholder obligations and expenses. There are two key differences between asset adequacy analysis and a solvency test:

- A solvency test is more inclusive, as all of the assets (including capital) and liabilities of the company are included in a solvency test.
- A solvency test typically requires a higher degree of certainty (e.g., 95%) than what may be necessary for asset adequacy analysis (e.g., 67%–83%, refer to Q91 and other material in Section J: Analysis of Results).

There is no requirement in either the ASOPs or the model SVL to test for a company's solvency in connection with the actuarial opinion that is filed with the statutory annual statement. However, as reserves are typically the largest liability of a life insurance company, asset adequacy analysis may be one of the tools used in assessing the overall financial health of life insurance companies. Risk-based capital (RBC) ratios also serve as a leading indicator of overall financial health.

### **Q5. What resources are available to assist the appointed actuary in understanding the requirements of asset adequacy analysis?**

Actuarial firms, associations, and regulatory bodies have developed and maintained numerous resources to assist the appointed actuary in understanding the requirements of asset adequacy analysis. The primary providers of these resources include the Society of Actuaries (SOA), the Academy, the NAIC, and state regulatory bodies.

*Valuation Actuary Symposium:* The SOA sponsors the Valuation Actuary Symposium. This annual meeting provides the appointed actuary with practical information about anticipated regulatory changes that will impact the asset adequacy analysis process. The symposium also provides the appointed actuary with a forum to discuss issues with groups of peers or with recognized experts. These meetings are recorded to provide a useful resource for those not attending the symposium. The SOA also sponsors periodic continuing education sessions on specific topics related to asset adequacy analysis, including modeling. Other available resources include SOA section newsletters such as *The Financial Reporter* and recordings of SOA meetings.

*Actuarial Standards of Practice (ASOPs) / Actuarial Compliance Guideline (ACG) No. 4:* The Academy, through select ASOPs adopted by the Actuarial Standards Board, provides resources to assist the appointed actuary in asset adequacy analysis. In addition, ACG No. 4 focuses on statutory statements of opinion not including an asset adequacy analysis (Section 7 of the 1991 AOMR / New York Regulation 126).



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Among the current ASOPs that discuss considerations for the appointed actuary performing asset adequacy analysis are:

- ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*
- ASOP No. 11, *Financial Statement Treatment of Reinsurance Transactions Involving Life or Health Insurance*
- ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*
- ASOP No. 23, *Data Quality*
- ASOP No. 41, *Actuarial Communications*

*Life and Health Valuation Manual*: The Academy also publishes a Life and Health Valuation Manual each year. This publication provides a state-by-state summary of valuation standards and provides a one-stop source for model laws and Actuarial Guidelines pertaining to valuation requirements.

*National Association of Insurance Commissioners*: The NAIC maintains information on model law adoption, as well as drafts of proposed legislation on its website. This information is intended to be an up-to-date source that can be used by the appointed actuary to determine whether new requirements that may impact the analysis process have been approved. In particular, the NAIC recently adopted a Valuation Manual that includes new requirements and guidance for the appointed actuary. The NAIC also provides educational information to state insurance department personnel regarding the work done by the appointed actuary. In addition, the *Accounting Practices and Procedures Manual* contains information useful for the appointed actuary.

*State Regulatory Bodies*: A few state regulatory bodies (New York and California, for example) currently provide the appointed actuaries of companies licensed in those states an annual letter describing specific considerations, requirements, and expectations related to asset adequacy analysis.

The remainder of this practice note is intended to be a resource to the appointed actuary by providing information regarding current practices in asset adequacy analysis.

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## Section B: Procedures for Accepting/Resigning the Position of Appointed Actuary

### Q6. What are procedures that an actuary follows in accepting or resigning a position as appointed actuary?

The AOMR (Section 5B) defines a “qualified actuary.” Section 5C identifies certain steps in the appointment process: “Assuming the actuary is qualified, the regulation states that a company shall give the commissioner of insurance timely written notice of the name of the appointed actuary, title (and, in the case of a consulting actuary, the name of his or her firm), and manner of appointment. . . . If an appointed actuary replaces a previously appointed actuary, the notice shall so state and give the reasons for replacement.”

The AOMR does not contain procedures for the actuary to follow when accepting or resigning the position; however, some states (for example, New York and Ohio) have additional requirements in their versions of the regulation.

According to the *Code of Professional Conduct*, Annotation 10-5, when an actuary consults with a previous appointed actuary, the previous actuary “shall cooperate in furnishing relevant information, subject to receiving reasonable compensation for the work required to assemble and transmit pertinent data and documents.”

Section 3.2 of ASOP No. 22 instructs a prospective appointed actuary to determine that he or she meets the requirements of the Academy’s *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States*. According to Section 3 of the Qualification Standards, this includes the Specific Qualification Standards, as well as the General Qualification Standard. Section 3.2 of ASOP No. 22 also requires that the acceptance of, or withdrawal from, the position be in writing.

VM-30 *Actuarial Opinion and Memorandum Requirements* of the NAIC’s Valuation Manual (VM-30) includes some changes to the AOMR. There are additional requirements when the appointed actuary is replaced by action of the board. According to Section 2A(2), the insurer will be required to notify the insurance department in the state of domicile within five business days of the event. According to Section 2A(3), within 10 business days, the insurer is also required to provide a separate letter stating whether in the 24 months preceding such event there were any material disagreements with the former appointed actuary regarding the content of the opinion, and cites additional steps to be taken.

### Q7. What information may the appointed actuary wish to obtain from the previous appointed actuary?

Prior to accepting the position as appointed actuary, some actuaries believe that it is prudent to meet with the most recent appointed actuary of the company to review: (1)

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reasons for the appointed actuary's termination and (2) the most recent actuarial opinion and supporting memorandum and documentation. This may inform the actuary of any items of concern to the previous appointed actuary (e.g., inadequate access to management or the board of directors, the qualifications of the persons or firms providing major reliance, or adverse scenarios in the cash flow testing (CFT) performed). Such a meeting could take place even if not required by a particular state.

**Q8. What is the relationship between the appointed actuary and the board of directors?**

The AOMR states that either the board of directors or an executive officer of the company acting under the board's authority is responsible for choosing the appointed actuary. The following is a list of questions that some actuaries consider prior to accepting the position as appointed actuary:

- Will the actuary be permitted to appear before the board of directors to present the statement of actuarial opinion and supporting memorandum, if the actuary wishes to do so?
- If the statement of actuarial opinion and supporting memorandum are presented to the board by a person other than the appointed actuary, is there assurance that the opinion and supporting memorandum will be presented in their entirety and will not be amended or edited by the third party?
- Will the actuary be permitted to meet with the board of directors at such other times as the actuary believes appropriate in order to communicate problems that may emerge between the annual statements of opinion?
- Will the board of directors agree to keep the actuary informed of certain transactions or conditions specified by the actuary via an agreed-upon process (e.g., attendance at board meetings, copies of board minutes and agendas)?
- Will the actuary have access to information, records, and members of company management as necessary to perform the duties of the appointed actuary?
- Will the resources required to fulfill the actuary's duties (e.g., electronic data processing, support staff) be made available?
- Will the board (or its designee) agree to make available such persons or officers identified by the actuary that the actuary may need to rely upon to form the opinion (e.g., the investment officer or the administrative officer)? If the requested persons or firms refuse to be relied upon or are found to be unqualified, will the actuary be permitted to consult with the board of directors regarding alternative resources?

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Some appointed actuaries inform the board of directors and/or senior management of the results from asset adequacy analysis. According to the 2012 survey, asset adequacy analysis results are presented to the following:

Chief Actuary	65%
Chief Financial Officer	70%
Other Senior Management	77%
Board of Directors	55%

In addition, VM-Appendix G, *Corporate Governance Requirements for Principle-Based Reserves* of the NAIC's Valuation Manual (VM-G), covers corporate governance guidance for valuations performed under principle-based reserves (PBR). Section 2 provides guidance for the board of directors, Section 3 provides guidance for senior management, and Section 4 provides guidance for qualified actuaries, including the appointed actuary. All three parties mentioned will have responsibilities with regard to corporate governance for PBR valuations, and communication among the parties will be essential.

**Q9. What documentation is provided with regard to the appointed actuary's personal qualifications?**

Qualification requirements are addressed in the Academy's *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States*. The Qualification Standards include basic education requirements, experience requirements, and continuing education requirements; Section 6 of the Qualification Standards includes requirements to keep timely records of continuing education. In addition to those requirements, the actuary may wish to document his or her personal breadth and depth of knowledge regarding the products, markets, and strategies of the particular company and, in doing so, identify areas where support or reliance may be needed to allow the actuary to perform his or her duties as appointed actuary.

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### Section C: General Considerations for Performing Asset Adequacy Analysis

#### Q10. How does the actuary decide what to test?

According to the 2010 AOMR, Section 5E, the opinion “shall apply to all in force business on the statement date.” According to Section 3, the opinion must be based on asset adequacy analysis. So, it follows that asset adequacy analysis applies to virtually all policyholder reserves and claims liabilities, subject to the following considerations.

According to ASOP No. 22 (Section 3.3.4.c.), “For a reserve or other liability to be reported as not analyzed, the actuary should determine that the reserve or other liability amount is immaterial.” (Section 6A(2) of the AOMR still identifies items not analyzed.) Guidance on materiality is provided in Section 7 of the Preamble to Statutory Accounting Principles (i.e., “Is this item large enough for users of the information to be influenced by it?”).

A possible measure of materiality a percentage of total reserves. Five percent is mentioned in a letter to appointed actuaries dated Nov. 3, 1994, from the Illinois Department of Insurance. Another possible measure is a fixed dollar limit in determining materiality, considering other financial information of the company. In addition, the actuary may want to do a closer inspection of any product with an immaterial reserve to confirm that the reserve properly reflects the significant risks of the product, if any. Actuaries could evaluate materiality at a product level and/or in aggregate. In the final analysis, the actuary may exercise professional judgment to confirm that inclusion of “immaterial” amounts that have been excluded from the analysis would not result in different findings in his or her actuarial opinion, report, or recommendation.

In the 2012 survey of appointed actuaries, approximately 80 percent of the respondents indicated that they exclude 5 percent or less of the general account liabilities from testing. For separate account liabilities, about 67 percent of the respondents that have separate account liabilities exclude 1 percent or less of those liabilities. Specific lines that have been excluded by survey respondents are listed below, mostly due to the relative immateriality in the context of the respondent’s book of business:

- Group business
- Accident and health
- Supplementary contracts
- Accidental death benefit
- Waiver of premium and disability riders
- Other supplemental benefits
- Claim reserves

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### Q11. What methods are used when performing asset adequacy testing?

As indicated by the responses to the 2012 survey of appointed actuaries, the most commonly used method in asset adequacy analysis is CFT (see ASOP No. 7).

The survey responses exhibited the following percentage breakdown of average tested reserves by asset adequacy method:

Cash flow testing	86%
Gross premium valuation	6%
Demonstration of conservatism	2%
Risk theory techniques	1%
Loss ratio	1%
Other	4%

Although asset adequacy analysis does not necessarily imply CFT, the actuary, exercising professional judgment, may decide that CFT is the most appropriate methodology for certain lines of business. For instance, the product design of universal life and deferred annuity lines of business generally renders their reserves sensitive to fluctuations in interest rates. According to ASOP No. 22, Section 3.3.2, “cash flow testing is generally appropriate where cash flows of existing assets, policies, or other liabilities may vary, or where the present value of combined asset, liability, or other cash flows may vary under different economic or interest-rate scenarios.” For certain purposes, such as to aggregate results of several lines of business, it may be useful to cash flow test certain non-interest-sensitive lines of business, such as term life insurance, in a manner consistent with interest-sensitive lines. There could also be a desire for consistency under X-factor testing (e.g., sensitivity test mortality on a consistent basis for universal life and traditional life). If the appointed actuary aims to treat results in aggregate, such as using positive cash flow from a non-interest-sensitive line of business to offset a deficit in an interest-sensitive line of business or incorporating overhead expenses at a company level, a consistent CFT approach across all lines may be the preferred method to determine asset adequacy.

However, as is indicated in the above table, CFT is not the only acceptable method for testing the adequacy of reserves. ASOP No. 22, Section 3.3.2, goes on to say that “asset adequacy test methods other than cash flow testing may be appropriate in other situations.” The actuary may also wish to consider Sections 3.2.1 and 3.2.2 of ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*, which address the relative appropriateness of CFT in various situations.

Section 3.3.2 of ASOP No. 22 lists several alternative approaches that may be appropriate methods, depending on the circumstance. These include the following:

**Gross Premium Valuation.** A gross premium valuation (GPV) involves a projection of the liability premiums, benefits, and expenses. It determines the value of a book of business based on the present value of the benefits and expenses less gross premiums. A liability model is necessary, along with a projection based on that model and reasonable

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assumptions, but an asset projection is not needed. (See Q21 for discussion of setting the discount rate.) The appointed actuary may have already developed liability models, or may have access to models that others in the company have developed for pricing or other internal purpose. A GPV may be appropriate where the policy and other liability cash flows are sensitive to moderately adverse deviations in the actuarial assumptions underlying these cash flows but are not sensitive to changes in interest rates (see ASOP No. 22 for an example).

***Demonstration of Conservatism.*** Some actuaries demonstrate asset adequacy through the conservatism found in some reserves, that is, where the actuary considers the degree of conservatism in the reserves to be so great that moderately adverse deviations in the actuarial assumptions underlying the policy cash flows are covered. For example, this type of method may be appropriate for a block of older life insurance if that block is reserved using conservative valuation interest rates and mortality/morbidity tables. In this case, demonstration of conservatism could be observed as the valuation rate being moderately lower than the ultimate reinvestment rate in any scenarios that might be considered. Another example that may be appropriate for this type of method is with respect to policies reserved for using a Principle-Based Approach (PBA). In this case, the assumptions used in the valuation (including interest rate paths of a stochastic scenario path) or the method (e.g. CTE70) used to determine the reserve may be judged by the actuary to meet a moderately adverse degree of conservatism. (See Section L for further discussion.) Nevertheless, if there is any doubt about the level of conservatism not being at least moderately adverse, most actuaries may prefer to use one of the other methods described herein.

***Risk Theory Techniques.*** If the liability under consideration is short term in nature, risk theory techniques may be sufficient to demonstrate asset adequacy. For instance, risk theory might be appropriate for a short-term disability coverage that is supported by short-term assets. Probabilities of continuance of disability claims can be calculated based on a distribution developed from historical claim experience. The parameters of the function associated with this probability distribution can be varied to develop the sensitivities under moderately adverse deviations. Given the short-term nature of the assets assigned to back their liabilities, it may be appropriate to ignore the effect of interest.

***Loss Ratio Methods.*** Loss ratio methods may be appropriate for short-term health insurance business, assuming that the supporting assets are also short term. Aggregate incurred health claims could be estimated by applying estimated loss ratios to earned premiums. Again, various moderately adverse deviation sensitivity tests can be developed to ascertain asset adequacy.

### **Q12. What are the primary differences between cash flow testing and gross premium valuation?**

GPV is described in Q11. In a GPV, the value of the liability is calculated as the present value of the projected benefits and expenses less gross premiums. The projection of these

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liability cash flows is generally the same as in CFT, with the complexity of modeling depending on the material risks in the liability. However, unlike CFT, a projection of asset cash flows is not developed. As the asset cash flows are implicitly provided for through the use of discount rates in the calculation of present values, GPV models tend to be somewhat simpler than those used for CFT. So, they may be set up and managed on a less structured platform, such as a simple spreadsheet model.

A GPV may be appropriate when the liabilities are not interest sensitive and when the asset cash flows are either not interest sensitive or can be reasonably represented by varying the discount rate. Term life, whole life, disability income, long-term care, major medical, Medicare supplement, and accidental death and dismemberment are examples of insurance products for which GPV has been used to test asset adequacy. CFT may be more appropriate where cash flows vary significantly under different economic or interest rate scenarios. A simple GPV typically cannot indicate when there are interim cash flow or duration mismatches in the portfolio.

A GPV is generally validated in the same manner as is CFT. The 2004 survey of appointed actuaries indicated that most appointed actuaries do a static validation of a GPV, where opening balances of the models are checked against actual inforce. About half also conduct certain dynamic validations (refer to Q19 for further information), where projections from the model are compared against financial forecasts.

Approaches taken to reflect reinsurance generally apply to GPV as they would for CFT.

### **Q13. Are different lines of business aggregated for purposes of asset adequacy analysis?**

The board of directors for each company names one appointed actuary for that company. In general, the appointed actuary opines on the adequacy of the company's reserves in the aggregate. Thus, lines of business, such as life insurance, annuities, and health, may be combined. As a practical matter, actuaries commonly perform tests by groupings, such as major product lines or business units. These product or business units may not necessarily correspond with annual statement lines of business.

The 1991 AOMR allowed aggregation of reserves and assets before analyzing the adequacy of the combined assets to support the combined liabilities. It also allowed aggregation of the results of separate asset adequacy analyses if the appointed actuary has determined that the results are developed under consistent economic scenarios and the business is subject to mutually independent risks. Specifically, it allowed redundancies in one line to offset deficiencies in another, provided that either (1) the results have been developed using consistent economic scenarios, or (2) the lines involve mutually independent risks.

The 2001 AOMR (which is in effect in most states as of the date of this practice note) does not give precise guidance on aggregation, although it refers to "aggregate reserve"



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and “aggregate surplus.” Some states have different requirements related to aggregation across major lines of business, some of which require approval for aggregation, or do not permit aggregation in certain circumstances.

Because there is no uniform guidance regarding aggregation across lines of business for determining reserve adequacy, aggregation practices vary. The following table summarizes responses to the 2012 survey of appointed actuaries regarding aggregation for modeling purposes and to determine reserve adequacy:

<u>Model Runs</u>	<u>Measurement of Reserve Adequacy</u>		
	<u>In Aggregate</u>	<u>By Line of Business</u>	<u>Smaller Blocks</u>
In Aggregate	√		
By Line of Business	√	√	
Smaller Blocks	√	√	√

Product lines often subject to stand-alone reserve adequacy included long-term care, certain types of UL with secondary guarantees, separate account products, life insurance, group life, annuities, and health (due to the gross premium floor). Stand-alone testing is now required for certain products or lines of business in many states.

When reviewing interim (year-by-year) results, 80 percent of the 2012 survey respondents indicated that they aggregate reserves in the same manner as they do when reviewing terminal (end of projection horizon) results. Among those who aggregate differently, 14 percent aggregate at the major line of business level, 4 percent aggregate at the total company level, and 2 percent aggregate at the block of business level.

When aggregating the results of asset adequacy analysis of various lines of business, many actuaries believe it is usually desirable to have consistency among the economic scenarios used for each of the lines of business. If different projection periods are used for the lines being combined, then the results typically can be aggregated at a common valuation point. For this aggregation approach, some actuaries project each line separately and discount the excess of the ending market value of assets less liabilities back to the projection date, in order to get results that may be combined on a consistent, scenario-by-scenario basis.

If different analysis methods are used to determine the asset adequacy for various lines of business (e.g., GPV for some and CFT for others), it may be inappropriate to combine results unless consistent economic scenarios are used. GPV results usually can be aggregated with CFT results when consistent economic scenarios are used for each of the lines of business, even if different projection periods are used.

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**Q14. How are assets allocated among lines if cash flow testing is done separately for each line?**

Many states require that any assets contractually allocated to a specific line for a special purpose (such as by reinsurance treaty or separate account) be allocated to that line for CFT. Beyond that, if the company has segmented assets by line of business (formally or notionally), then the allocation of assets to these segments may represent one good place to start. Similarly, some states require that “pledged” or “encumbered” assets be excluded from the assets available to support reserves. Assets cannot be allocated to multiple liabilities at the same time.

To the extent that the actuarial opinion covers all lines of business, it may be appropriate to assign assets differently from how they were allocated under an asset segmentation arrangement. However, to be prudent, the actuary would usually confirm that the same assets are not used for multiple liabilities.

Some actuaries take a pro-rata slice of each asset in proportion to the reserves of each line, although this method may not be preferred if the characteristics (e.g., effective duration) of the liabilities differs materially between lines.

Actuaries may also use different methods of asset allocation at different levels of modeling or testing. For example, while a company may have a single formal asset segment for interest-sensitive business, the actuary may choose to refine the allocation within the segment by duration for universal life, deferred annuities, and payout annuities.

Thus, the 2012 survey of appointed actuaries allowed respondents to specify more than one method for allocating assets by line of business:

Formal segmentation	67%
Pro-rata of all assets	37%
Other	15%

The most common “other” method is to allocate assets specifically to achieve a better matching of asset and liability cash flows. Also, many companies use some combination of these three methods at different levels.

Many actuaries maintain reasonable consistency from year to year in the method of allocating the assets to product lines. If a significant change in allocation method is made, the appointed actuary may consider documentation of the change and related impact on the asset adequacy results.

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**Q15. Can the actuary use a testing date prior to Dec. 31 for the purpose of the year-end actuarial opinion?**

Because it can be difficult to complete an asset adequacy analysis in time for the March 1 deadline using year-end data, it may be common to use data from a prior date. ASOP No. 22 (Section 3.3.4) gives guidance for using data prior to year-end in an asset adequacy analysis, and states that “The actuary should document the reasonableness of such prior period data, studies, analyses, or methods; that key assumptions are still appropriate; and that no material events have occurred prior to the valuation date that would invalidate the asset adequacy analysis on which the actuary’s opinion is based.”

Approximately 60 percent of the respondents to the 2012 survey of appointed actuaries indicated they base their testing on a liability as-of date earlier than Dec. 31, with 93 percent of those using a date of Sept. 30 and the remainder using a later date. Comparable responses were provided regarding the as-of date for assets, and there is evidence of occasional differences between the valuation dates of inforce assets versus liabilities.

When an actuary chooses a testing date earlier than the valuation date, the actuary may wish to provide a demonstration that there have been no material changes between the two dates. To make this demonstration, an actuary may compare assets by asset category for the testing date versus year-end, considering the mix of assets and the nature of assets (e.g., duration, yield, type). Similarly, an actuary may compare the size of the liabilities by type and the nature of the liabilities (e.g., average size, policy counts, mix) as of the two dates. Some actuaries consider changes in the interest rate curve, equity movements, and the level of investment reserves between the testing date and year-end. Also, some may use additional sensitivity scenarios where the Dec. 31 yield curve is applied to earlier data.

From the 2012 survey of appointed actuaries, following is a summary of the percentage of respondents who use the respective methods to demonstrate whether there have been material changes between the testing date and the valuation date:

Change in liability volume	73%
Change in liability mix of business	69%
Change in asset volume	56%
Change in asset mix	79%
Changes in AVR, IMR, or DTA	27%
Change in yield curve	87%
Other (including spreads)	12%

With respect to the issue of changes in the yield curve, about one-third of the respondents indicated they use the year-end yield curve, while most of the rest use the yield curve for an earlier date. However, 40 percent of the respondents said they “look at yield curves as of the annual statement date,” while 30 percent of the respondents said they “look at yield curves as of the opinion signing date.” Of that 70 percent of the respondents, most indicated that they use some combination of interpolation, sample testing, sensitivity

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testing, or full retesting to calculate the impact of the change in yield curve, depending on the materiality of the change and other circumstances.

### **Q16. How do actuaries interpret “moderately adverse conditions” in asset adequacy analysis for purposes of compliance with ASOP No. 22?**

Item 3.4.2 of ASOP No. 22 states the following:

When forming an opinion, the actuary should consider whether the reserves and other liabilities being tested are adequate under moderately adverse conditions, in light of the assets supporting such reserves and other liabilities. To hold reserves or other liabilities so great as to withstand any conceivable circumstances, no matter how adverse, would usually imply an excessive level of reserves or liabilities.

Item 2.15 of ASOP No. 22 defines “moderately adverse conditions” as follows:

Conditions that include one or more unfavorable, but not extreme, events that have a reasonable probability of occurring during the testing period.

Some actuaries believe this item implies that asset adequacy analysis would ordinarily be performed with at least one scenario or set of conditions that are more adverse than current conditions. Although ASOP No. 22 does not call for reserves to be adequate under extreme or worst-case conditions, some actuaries would say that reserves have not been adequately tested if testing conditions assume that all situations will get less adverse and no situation will be more adverse than the present. Many actuaries consider moderately adverse conditions applicable to several assumptions within a scenario, not just one assumption.

Also, some actuaries consider the current economic environment when determining what constitutes “moderately adverse conditions.” For example, in a period of very low interest rates, some actuaries would view several of the decreasing scenarios required by New York Regulation 126 (such as the falling scenario and the pop-down scenario) as going beyond the definition of “moderately adverse conditions.” This is particularly true when considering a long projection period, such as 20 years or more. But in times of high interest rates, some actuaries would view these decreasing scenarios as an appropriate level of moderately adverse conditions.

Finally, some actuaries interpret moderately adverse conditions by looking at the conditions and assumptions used for each scenario, rather than by looking at the financial results coming out of the scenarios. The same conditions can produce adverse results for one type of business or risk profile and favorable results for another, and two types of business might offset each other to some extent.

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### Section D: Modeling Considerations – General

#### Q17. What modeling platforms are used to model liabilities?

Based on the results of the 2012 survey, there were 15 commercial software packages used by the respondents for the liability projections. The 2012 survey responses also indicate that internally developed systems or internally developed spreadsheets are commonly used by companies to model a portion of the liability cash flows.

See Q41 for a discussion of platforms used to model assets.

#### Q18. How long are the projection periods used by actuaries?

ASOP No. 22 (Section 3.3.4.b) states the following: “Asset adequacy should be tested over a period that extends to a point at which, in the actuary’s professional judgment, the use of a longer period would not materially affect the analysis.”

Approximately 52 percent of the respondents in the 2012 survey indicated that they do not establish a projection period using criteria based solely on the extent of the original liabilities that are expected to mature. Of the 48 percent who responded that they do use a materiality level to determine the length of the projection period, 75 percent use a materiality level of 90 percent.

Approximately 45 percent of the 2012 survey respondents indicated they use the same projection period for all products. Relative to these respondents, 50 percent use a projection period of 21–30 years, 12 percent use a projection period of 31–40 years, and 23 percent use a projection period of more than 40 years.

The 55 percent of 2012 survey respondents who use different periods by product responded offered additional usage details, summarized in the following. Percentages noted are based on the responses that indicated different projection periods by product:

- The most common period for individual traditional life products is 21–30 years, including term insurance and permanent insurance, whether par or nonpar (39 percent). However, 28 percent of the respondents used a period longer than 40 years.
- For individual fixed deferred annuities, 41 percent use between 21 and 30 years, while 32 percent use 11–20 years. Of group annuities, 50 percent use 20 years or less, but about one-third use greater than 40 years. Fixed payout annuities and structured settlements had longer periods. Of payout annuities, 39 percent use more than 40 years, although 33 percent use 21–30 years. Of structured settlements, 73 percent use more than 40 years. In the 2004 survey, in contrast, 70 years was the most common projection period for structured settlements.

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- For universal life with secondary guarantees, 46 percent of companies use more than 40 years.
- For other universal life, 85 percent use 21 years or more, but were fairly evenly divided among the 21–30-, 31–40-, and greater-than-40-year groupings.
- Health products other than long-term care and disability tend to use shorter periods, with 75 percent being 30 years or less and fairly evenly divided among the less than 20, 11–20 and 21–30 time periods for other health. Disability insurance is somewhat longer, with 41 percent using greater than 40 years and 27 percent using 21–30 years.
- Long-term care had longer periods as well, with 63 percent of respondents using more than 40 years.

#### **Q19. What types of model validation do appointed actuaries perform?**

In the 2012 survey of appointed actuaries, 88 percent of the respondents stated that they perform static validations, such as comparing opening balances, policy counts, and other key metrics against actual amounts.

Dynamic validations are performed by 51 percent of the respondents. In a dynamic validation, the actuary compares projections coming from current models against recent actual results (retrospective) or financial forecasts, such as company plan. Furthermore, some actuaries compare actual results with the prior year's models in order to improve current models.

In addition to static and dynamic validations, some actuaries perform attribution analysis, during which the actuary performs a step-by-step analysis of the change from the prior year's models to the current year to confirm that the model appropriately reacts to changes in inforce, actuarial assumptions, and/or macroeconomic conditions. Depending on the use, attribution analysis is performed using either deterministic or stochastic scenarios.

#### **Q20. How is the discount rate determined that is used to calculate the present value of ending surplus at the valuation date?**

There are currently several methods used to determine a discount rate. One is to use the pre- or after-tax earnings rate (i.e., the average investment earnings rate) over the projection period used in each scenario, either including or excluding the impact of policy loan interest. Another method is to rerun the scenario adding \$1,000 (or 1 percent) to the initial assets. The change in the ending difference can be used to determine the discount rate for that scenario. Another alternative is to use the pre- or after-tax Treasury spot rates for the length of the projection period—e.g., 20 years—which is generated under each scenario. Although outlier discount rates may distort the present values, only 22 percent of actuaries use floors, caps, or other methods to minimize such distortions.

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From the 2012 survey of appointed actuaries, approximately 15 percent of the respondents indicated they do not calculate a present value of ending surplus. Of those who do, below is a summary of the methods used to determine the discount rate:

After-tax earnings rate, including policy loan interest	36%
After-tax earnings rate, excluding policy loan interest.	24%
After-tax Treasury spot rates for the length of projection period	4%
Pre-tax earnings rate, including policy loan interest	6%
Pre-tax earnings rate, excluding policy loan interest	4%
Pre-tax Treasury spot rates for the length of projection period	6%
Rerun the scenario with additional initial assets, determine discount factor based on change in surplus	4%
Other	16%

In the above table, “other” methods include such items as:

- A single specified rate
- Pre- or after-tax new money rates

#### **Q21. How does the actuary set the discount rates for a gross premium valuation?**

The discount rate used in determining the present values of a given scenario is generally consistent with the expected earned rate on the assets backing the liabilities for that scenario. Some actuaries use a level net earned rate based on a recent average portfolio yield of the assets (use of pre-tax or after-tax rates may relate to treatment of taxes within the model). Another method in use is to derive the discount rate curve from the projected after-tax net earned rate of the actual assets in the portfolio and purchased based on the investment strategy. For conservatism, some actuaries set the earned rate used for discounting purposes lower than the rate earned by the company’s assets.

Sometimes a single-level discount rate will be used for a given scenario. However, if new money rates have recently moved or are expected to change going forward within the scenario being tested, some actuaries consider a change in the discount rate over time. If future new money rates are expected to be lower than the rate currently earned on the current assets, then the discount rate generally could be assumed to decline over time as the liabilities increase or as assets roll over and earn future new money rates due to maturities, calls, or prepayments. The discount rate may also be subject to a floor (e.g., 0 percent) determined by the actuary. If the scenario has new money rates rising, the discount rate might be increased over time. If changes in asset yield for a material block of business cannot be adequately modeled through the use of discount factors, some actuaries consider using CFT instead of GPV.

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Some actuaries test the option risk in assets (e.g., calls) by assuming an immediate drop in the discount rate used in the GPV. The drop test is often set as severe as needed to represent a drop in earned rate that would occur if all options were exercised.

**Q22. The AOMR states that the interest maintenance reserve (IMR) should be used in asset adequacy analysis. Why?**

The IMR is part of the total reported statutory reserves. The IMR typically defers recognition of the portion of realized capital gains and losses resulting from changes in the general level of interest rates. These gains and losses are amortized into investment income over the expected remaining life of the investments sold, rather than being recognized immediately. This amortization is after tax.

The purpose of the IMR usually is to maintain the original matching between assets and liabilities that might be weakened by the sale of an asset. Originally, it was anticipated that the IMR would be allowed to become negative, as long as the asset adequacy analysis showed that the total statutory reserves, including the negative IMR, were sufficient to cover the liabilities. However, a negative IMR is not an admitted asset in the annual statement. So, some actuaries do not reflect a negative value of IMR in the liabilities used for asset adequacy analysis.

In the 2012 survey of appointed actuaries, more than 80 percent of the respondents indicated they include the IMR in their testing. Some actuaries use a starting IMR of zero if IMR is negative. Other actuaries use negative IMR to adjust starting assets and therefore model future lower asset yields than if zero IMR were assumed. Half of the respondents who indicated they used IMR in testing also indicated they lower assets by the absolute value of a negative IMR balance; the other half indicated they use a value of zero for the starting IMR if it is negative at the beginning of the projection period. There is no prohibition regarding the use of negative IMR within asset adequacy analysis. So, a number of actuaries allow the IMR to fall below zero within the testing period. About 60 percent of actuaries responding to the survey indicated they do not have to deal with a negative IMR.

**Q23. How does the actuary determine which portion of the IMR can be used to support certain products? How is the portion of the IMR used?**

If the actuary allocates the assets and IMR by line, then one possible approach is line of business-level inclusion of starting assets in the amount of the unamortized portion of the IMR relating to those assets that were owned by the line prior to being sold. Another possible approach is the allocation of company-level IMR proportionately to starting assets. An advantage of this second approach is that it is generally simpler, while a disadvantage is that longer liabilities probably have longer assets, which usually produce higher capital gains when sold, after a given drop in interest rates, than shorter assets do,



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leading to an overallocation of IMR to the shorter liabilities. Another approach may be to allocate based upon reserve balance and effective duration within each segment.

Respondents to the 2004 survey indicated the following methods of allocating starting IMR by line:

In proportion to total assets by line	56%
In proportion to unamortized IMR for each line	16%
In proportion to asset types within each line	10%
Other	20%

If the actuary has software that can be used to model the development of the IMR itself, then he or she could start with assets equal to reserves plus the portion of the IMR and model the changes to IMR as assets are sold during the projection.

#### **Q24. How is the asset valuation reserve treated in cash flow testing?**

From the 2012 survey of appointed actuaries, 45 percent of the respondents indicated they do not include the Asset Valuation Reserve (AVR) in testing. Those respondents who indicated they do include AVR (55 percent of the total) reported three issues they typically consider regarding the use of the AVR:

1. The amount of assets to include at the beginning of the projection;
2. Whether to model the change in the AVR during the projection; and
3. How to treat any AVR remaining at the end of the projection.

The AOMR states that AVR may be used to provide for default risks but that it cannot be used for other risks. Many actuaries (in the 2012 survey of the appointed actuaries, 51 percent of those who model the initial AVR) believe that it is preferable for the beginning assets supporting the AVR to be no more than the present value of defaults. There are several choices in using beginning AVR assets, including the following.

1. For each scenario, develop two sets of projections: (1) without defaults and (2) with defaults. Discount the difference in ending surplus back to the projection date at an appropriate sequence of interest rates for the scenario. The maximum present value of this difference for all specified scenarios is the present value of defaults. If it is less than the pro-rata portion of the AVR described in Q25, then the actuary may run the projections without the AVR assets and without defaults (under the assumption that the AVR covers the cost of defaults).
2. If the pro-rata share of AVR is not sufficient to cover the present value of the cost of defaults for all scenarios, then for each scenario the actuary typically adds assets equal to the pro-rata AVR and runs the projections with defaults modeled.

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3. A conservative, simple choice is to model defaults but exclude the AVR.

Effective in April 2014, the NAIC adopted a proposal to limit the inclusion of AVR in the calculation of total adjusted capital to the amount not used in asset adequacy analysis in support of the actuarial opinion. As such, the appointed actuary may consider consultation with others in the company to ensure appropriate treatment in the actuarial opinion and the company's annual statement.

In addition to the above choices concerning beginning assets, if the actuary can model the development of the AVR itself, then the actuary usually can start with assets equal to the liability reserves, plus the full pro-rata AVR (limited to the amount of present value of defaults), and model the contributions to AVR, as well as project defaults. While some actuaries prefer more complex models that use defaults and AVR, others prefer the simpler models without AVR.

See Q26 for how actuaries usually treat any remaining AVR at the end of the projection.

#### **Q25. How does the actuary determine the portion of the AVR that can be used to support a certain business unit?**

Some actuaries use a pro-rata share of the default component of the AVR to help support the obligations of a specific business unit, based on the assets chosen to back the line from page 29 (the first AVR page) in the annual statement,<sup>1</sup> with the following variables (note that the page and line references in this answer are from the 2015 NAIC annual statement format):

ratio (maximum value of 1)	actual current bond and preferred stock component (line 8) maximum current bond and preferred stock component (line 9) or comparable lines for the mortgage or other components
Factor	reserve factor by investment-grade group (page 30 or 31 of the annual statement)
statement value	amount in Schedule D, Part 1, Column 11 (book/adjusted carrying value) of the assets equal to reserves backing the particular line of business by investment grade

If this approach is used, the pro-rata share of the AVR for the assets backing the line is equal to the sum over all investment-grade groups (ratio × factor × statement value). In addition, the appointed actuary may consider including the AVR on the assets that are assumed to back AVR (i.e., the AVR on the AVR).

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<sup>1</sup> Annual statement references in this practice note are based on the NAIC Life/Health blank as of Dec. 31, 2015.

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Other approaches used are to (1) allocate the default component of the AVR in aggregate to each line of business, and (2) allocate each asset category of the default component of the AVR separately to each line of business.

Respondents to the 2004 survey who used AVR reported the following methods for allocating beginning AVR:

In proportion to total assets by line	62%
In proportion to default component by line	19%
In proportion to asset types within each line	7%
Other	12%

**Q26. If products with relatively short durations are cashed out at the end of the projection period, and the IMR and AVR are being modeled, what happens to the IMR and AVR at the end of the period?**

The IMR may be positive (or negative) when there are no policies left in force that need to have interest maintained. When the IMR is included in testing, some actuaries believe it is preferable to include the value of the ending IMR in the value of ending surplus.

The AOMR requires that AVR be used only to cover default risk. If there are still assets left at the end of the projection period, the AVR could be considered when determining the value of those assets. Some actuaries believe that only method 1 below is appropriate. Others believe that methods 2 and 3 below are more conservative and are therefore also appropriate.

1. Reflect value of ending AVR in determining ending surplus;
2. Exclude value of ending AVR in determining ending surplus; or
3. Add value of ending AVR only to the extent that assets are sold at a loss at the end; otherwise, exclude ending AVR.

Some actuaries consider it appropriate to reflect ending AVR only in the calculation of book surplus, with market surplus calculated by subtracting ending AVR from the otherwise ending market surplus. Some actuaries believe that releasing the AVR, if assets run out, is not consistent with using AVR only for default risk.

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### **Q27. What are some methods for reflecting any net deferred tax asset (DTA) or net deferred tax liability (DTL) in the asset adequacy determination?**

Some actuaries use CFT models that specifically project taxable income (e.g., tax reserves different from statutory reserves, deferred acquisition cost (DAC) tax accruals, and amortization). Some actuaries believe that the DTA and DTL (the admitted portion in the case of DTA) are analogous to the IMR and include the appropriate allocated portion in the modeling. In the case of DTAs, the DTA is usually part of the assets backing the reserves, replacing other assets. In the case of a DTL, additional assets may be assigned to back the DTL. Of course, in the case of a DTL, one conservative alternative would be to not reflect it in the modeling. Explicit modeling of projected future DTAs and DTLs may or may not be performed, depending on whether the appointed actuary believes there is a significant effect on interim results that may affect the opinion on adequacy.

Alternatively, some actuaries use CFT models that do not specifically project taxable income (e.g., taxable income is assumed to equal statutory income). In the most common situation where there is a DTA (whether admitted or not), this kind of projection is generally conservative with regard to projection of total taxes paid, so it would generally be appropriate to not take into account the DTA. In the situation where there is a net DTL, the projection usually would be understating future taxes, and some actuaries consider it appropriate to include a provision for additional taxes as indicated by the DTL.

In the 2012 survey of appointed actuaries, a small number of the respondents indicated that they project DTA and DTL balances (e.g., tax reserves, DAC tax accruals). The majority of respondents (85 percent) do not model initial DTA balances, with about half of those not modeling DTA balances because they are immaterial.

### **Q28. How are shareholder dividends treated?**

ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*, Section 3.10.4 states the following: “The actuary should consider how applicable law, and other external requirements relating to such things as financial statements and operating ratios, federal income taxes, insurer capitalization, and distribution of an insurer’s earnings to policyholders or shareholders are likely to affect future cash flows or constrain the range of possible scenarios. These factors should be appropriately reflected in the analysis.”

Based on the results of the 2012 survey, 51 percent of the respondents indicated that shareholder dividends are excluded because shareholder dividends are not applicable. Of the remaining 49 percent, about 10 percent explicitly include shareholder dividends in their model.

Given the small percentage of respondents who currently consider shareholder dividends in their testing, it is difficult to define common practice for modeling shareholder dividends. The actuaries who do model shareholder dividends typically do so based on company expectations.

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**Q29. How are policyholder dividends treated?**

Some actuaries treat policyholder dividends as fixed over all scenarios when modeling future cash flows, using the projected dividends under the current dividend scale. Other actuaries model policyholder dividends dynamically over the projection period, varying them by scenario based on changes in interest rates, expenses, or other parameters during the projection period. Because companies declare dividends for a year at a time, some actuaries build in a lag factor between experience changes and the time it takes to recognize and reflect those experience changes through changes in dividends.

Based on the 2012 survey of appointed actuaries, below is a summary of how policyholder dividends are modeled for those companies with policyholder dividends:

Modeled to approximate actual dividend policy	71%
Modeled in a simplified way	15%
Ignored as not material	12%
Other	2%

If the current dividend scale provides for an allocation of surplus to be paid out as dividends, some actuaries include the expected future allocation of surplus in the testing, clearly disclosing this in the actuarial memorandum. Others use dividends lower than their current dividend scale, reducing the dividends for the amount contributed from surplus.

**Q30. Do actuaries reflect reinsurance in modeling?**

ASOP No. 7, Section 3.8 states the following:

The actuary should consider whether reinsurance receivables will be collectible when due, and any terms, conditions, or other aspects that may be reasonably expected to have a material impact on the cash analysis.

ASOP No. 11, Section 3.2 states:

When preparing, reviewing, or analyzing financial statement items that reflect reinsurance ceded or reinsurance assumed, the actuary should consider potential cash flows that may, in the actuary’s professional judgment, have a material impact under the reinsurance agreement.

In the 2012 survey of appointed actuaries, 64 percent of the respondents indicated they model reinsurance in a way meant to approximate treaty terms.

ASOP No. 7, Section 4.3.g.(8), also states that the characteristics of any reinsurance agreements and how they were reflected in the analysis should be documented in the memorandum.

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### Q31. How is modified coinsurance treated in asset adequacy analysis?

The AOMR focuses on whether reserves are included or excluded from the analysis. However, in the case of modified coinsurance, the risks and the potential profits and losses may not accrue to the same statutory entity that holds the reserves on its balance sheet. Many actuaries believe it is preferable for the asset adequacy analysis to occur in the statutory entity where the risks are present. This might mean performing CFT on assumed modified coinsurance, even though the assuming company does not hold the reserve balance or the assets on its balance sheet. Conversely, it might mean not performing CFT on ceded modified coinsurance even though the reserves and assets are reported on the ceding company's balance sheet. Nevertheless, this does not necessarily mean that those reserves are excluded from asset adequacy analysis. They might be reported in the opinion as being included in the analysis but as representing minimal asset risk (because the risks have been ceded to another company). Although the ceding company may not have to perform CFT on ceded modified coinsurance, some actuaries do review the rating and the CFT work done by the assuming company to confirm that the risk to the ceding company is indeed minimal.

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### Section E: Modeling Considerations—Scenarios

#### **Q32. What approaches to modeling economic scenarios are currently included in appointed actuaries' practice when doing asset adequacy analysis?**

Economic scenarios used for asset adequacy analysis usually incorporate interest rates and/or equity returns as key variables, as they are the most important economic variables for many lines of business. Other economic scenario variables that may be included, if material to the results, include separate account fund returns, inflation rates, asset spreads, and asset default rates. In fact, some actuaries limit their economic scenarios to interest rates and/or equity returns, and treat other economic variables through sensitivity tests, if appropriate.

Approaches currently used to represent interest rate and/or equity return scenarios in actuarial models may be categorized broadly as deterministic and stochastic. In a deterministic approach, one or more handpicked scenarios of future rates/returns are used. An example of this is the seven required interest rate scenarios described in New York Regulation 126, often referred to as the New York 7 scenarios. These scenarios are determined each year so that the initial values are set to the current interest rate yield curve. The New York Department of Financial Services has released bulletins that describe the manner of constructing the interest scenarios.<sup>2</sup> Past bulletins have included direction on use of a maximum rate of 25 percent, a floor of one-half of the starting five-year Treasury rate, and yield curve shifts. Some actuaries also add inverted yield curve scenarios to the basic seven. In the 2012 survey of appointed actuaries, when testing with the New York 7, 32 percent of the respondents indicated that they floor the rates at half the initial rate for each maturity, 39 percent at the initial rate less half of the initial five-year Treasury rate, 12 percent at half of the initial five-year Treasury rate, and 3 percent at a specified rate, while 6 percent indicated that they do not apply a floor and 7 percent indicated they use some other floor. Another example of a deterministic interest-rate scenario would be based on the company's best estimate, commonly the forward curve that can be observed from the yield curve as of the valuation date.

Stochastic methods generally fall into two categories: realistic (real-world) scenario models and option-pricing (risk-neutral) models. Real-world scenario models use probability distributions of future scenarios based on a combination of historical experience, current economic conditions, and future expectations (e.g., economists' predictions). Risk-neutral scenario models have scenario probabilities or rates calibrated to replicate existing asset values and are not necessarily representative of realistic future expectations. Some actuaries believe that risk-neutral scenarios are especially appropriate for multi-scenario CFT. In the 2012 survey, 47 percent of the respondents reported they use stochastic interest rate scenarios, of which 72 percent use only realistic scenarios, 14

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<sup>2</sup> At the time this practice note was published, the insurance industry hub of the New York Department of Financial Services website was at [http://www.dfs.ny.gov/insurance/dfs\\_insurance.htm](http://www.dfs.ny.gov/insurance/dfs_insurance.htm).

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percent use risk-neutral scenarios, and 14 percent use a combination of realistic and risk-neutral scenarios. When generating stochastic scenarios, some actuaries consider correlations among variables, such as short- and long-term interest rates, or interest rates and equity returns. The survey results reflect that most actuaries incorporate such correlation in scenario generation, primarily by use of historical data or leveraging what has been produced by the American Academy of Actuaries.<sup>3</sup>

**Q33. Which of the above approaches are appropriate if asset adequacy analysis is required, and how many and what types of scenarios are tested?**

ASOP No. 7 (Section 3.10.1) contains the following statements:

Depending on the purpose of the analysis, more than one scenario may be used.

and

Scenarios may be generated by either deterministic or stochastic methods.

Section 3.10.1.b also states:

[T]he actuary should consider a sufficient number of scenarios to reasonably represent the underlying variability of the asset, policy, or other liability cash flows.

Asset adequacy analysis seeks to determine whether the reserves and other liabilities are adequate under moderately adverse conditions. Any approach that provides sufficient information to make this determination is generally appropriate. Testing of the New York 7 scenarios had been required by many states, and some actuaries believe that these provide a sufficient variety of scenarios for their analysis. The 2001 AOMR, which has been adopted in most states, no longer requires that the New York 7 scenarios be tested. Nevertheless, some actuaries believe there is an expectation either to continue testing these scenarios as a useful benchmark or to treat them as the minimum required scenarios.

In the 2012 survey of appointed actuaries, 87 percent of the respondents indicated they test at least the New York 7 scenarios; 14 percent test the “modified” New York 7 (the New York 7, plus one or two additional deterministic scenarios, which may be an inverted yield curve and/or a best estimate based upon the forward curve). More than nine deterministic scenarios are tested by 50 percent of the respondents, and 16 percent test 20 or more. Some respondents test fewer than seven scenarios. In the same survey, 66 percent of the respondents said that the New York 7 scenarios are used for the asset adequacy opinion, 10 percent said they are not used, and 24 percent said they had made “other changes” to their reserve adequacy criteria.

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<sup>3</sup> See <http://www.actuary.org/content/economic-scenario-generators>.



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As noted above, 47 percent of the respondents indicated they test stochastically generated interest rate scenarios, with the median number of scenarios tested being 100. Some actuaries generate a large number of stochastic scenarios (e.g., 1,000 or 10,000) but then select a smaller, representative subset (e.g., 50 or 100) that is actually used in the testing. The representative subset is usually chosen so that such metrics as the mean, median, range, and variance of the subset approximate the distribution of the full set of scenarios. Relative to the 47 percent of the respondents indicating they test stochastically generated interest rate scenarios, 16 percent use stochastic testing for assumptions other than interest rates. The vast majority of this group use it for separate account equity returns, although a few respondents indicated its use for mortality or morbidity.

Some actuaries who base their conclusions on the results of stochastic scenarios still find the New York 7 useful for model validation. Those who take this position generally believe the New York 7 scenarios have clear movements (e.g., pop-up and pop-down) that allow the user to inspect whether the results of the model are reasonable, given such rate changes. For example, the pop-down scenario would generally be expected to show larger asset prepayments; the pop-up scenario, to show larger cash surrenders (assuming the existence of such interest-sensitive assets and liabilities).

Approximately one-third of the respondents indicated they include separate account equity return scenarios in testing. Of the respondents who include separate account equity return scenarios in testing, 40 percent use deterministic scenarios only, while 60 percent use stochastic scenarios. When using stochastic equity return scenarios, the survey results indicated that the number of equity indices modeled range from one to six or more, with the most common number of indices being one or four.<sup>4</sup>

### **Q34. Is there any time when a single interest rate scenario path may be appropriate?**

For products that have little or no exposure to interest rate risk, such as short-term health insurance backed by short-term assets, some actuaries believe it may be appropriate to use a single interest rate path across all scenarios that vary other assumptions.

### **Q35. What types of stochastic scenario models are included in current actuarial practice?**

There are several types of stochastic scenario models commonly used. One approach is to use a binomial lattice to generate future rates, although this typically is limited to risk-

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<sup>4</sup> Actuaries wishing to follow research in this area may choose to refer to an ARCH 2004.1 article, "Modeling of Economic Series Coordinated with Interest Rate Scenarios: A progress report on research sponsored by the Casualty Actuarial Society and the Society of Actuaries," by K. Ahlgrim, S. D'Arcy, and R. Gorvett.

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neutral models, while another is to use a Monte Carlo approach to calculate period-to-period changes in interest rates.

Sometimes, changes in long- and short-term interest rates are calculated separately (i.e., using distinct distribution functions), and an interpolation procedure is used to approximate a yield curve. The lognormal probability distribution is also commonly used. However, some actuaries believe, especially if the tails of the probability distribution are a concern, that the lognormal distribution does not necessarily produce enough extreme scenarios. One approach that produces results with so-called fat-tailed distributions is the regime-switching model. The regime-switching model has been used, for example, in recent Academy proposals for scenarios associated with setting RBC and reserve requirements for variable annuity guarantees and the analysis of guarantees provided by segmented fund products (similar to variable annuities) in Canada. The Academy's proposals include calibration criteria that may be applied to results of other scenario generators. If the parameters of these scenario generators are adjusted so that their results meet the criteria, then these scenario generators may be an appropriate alternative to other methods.

There is a large amount of literature available regarding stochastic scenario generators. Lists of references may be found in the specialty guides, *Asset-Liability Management BB-1-03* and *U.S. Statutory Financial Reporting and the Valuation Actuary I-2-97*. These guides are available on the SOA website.

### Q36. What is reversion to the mean?

Reversion to the mean is a tendency, built into a model, for random values to move toward a target value (mean) over time. For stochastic scenario models, this is accomplished by modifying the output of the sampling procedure, perhaps by multiplying by a reversion factor that, in turn, is a function of a parameter called the strength of mean reversion. If the strength is zero, no mean reversion occurs; if it is unity, the interest rate is immediately set to the target value. Mean reversion accomplishes two things: It reduces longer-term volatility and it pushes the average of the scenarios toward a desired target.

For interest rate scenarios, various choices of target rates have been used, including the initial rate, a historical average, a rate based on the forward rates in the initial yield curve, and economists' projections. Mean reversion may have more effect on pricing (where the mean of the scenario results is used) or the amortization pattern of an amount of capitalized expenses than on asset adequacy analysis (where the concern is on adverse scenarios), but the actuary may choose to consider the extent to which the existence of mean reversion in the scenarios might contribute to volatility across scenarios that is not as large as expected or desired.

In the 2012 survey of appointed actuaries, more than 90percent of the respondents who indicated they test stochastic interest scenarios for fixed interest rate instruments use mean reversion, with more than 70 percent of them using a mean reversion target based on

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historical averages. Several actuaries said they use the assumptions embedded in the Academy generator or the RBC-200 model. For those using mean reversion, there was considerable diversity in the time period used to revert to historical rates, with time periods ranging from 90 days to 50 years and a slight concentration at 10 years. One-third of the respondents answered “not applicable” to this question even though they do use mean reversion, while 17 percent said simply that they use the Academy generator.

The 2012 survey did not ask about mean reversion for equity scenarios, but it did ask about the expected annual (compound) return of large-cap U.S. stocks. Most responses were in the range of 5.0-9.0 percent, with a median of 7.5 percent.

### **Q37. How can an economic scenario generator be validated?**

A risk-neutral generator can usually be validated by testing that the assets valued using the scenarios replicate existing market values. A realistic scenario generator can typically be validated by testing various statistics (e.g., distribution of rates, percentage of inverted yield curves) against historical distributions.

### **Q38. If some elements of a set of stochastic scenarios are clearly unreasonable, can these be ignored or replaced?**

Some actuaries believe in using each element within a set of stochastic scenarios, without replacement or de-emphasizing, based upon a statistical argument. They reason that throwing out selected scenarios in a random sample could destroy the randomness of the sample. In addition, they reason that recent history is not necessarily a safe guide to judge what is reasonable within a set of stochastic scenarios.

For example, the high interest rates of the early 1980s were unforeseen in the 1970s; similarly, the current low interest rates were not forecast in the 1980s. However, if the set of resulting interest rates as a whole appears to exhibit more than expected numbers of extreme scenarios (however defined by the actuary—e.g., negative or almost zero interest rates, or rates in excess of 30 percent), it implies that either the model parameters are incorrect (wrong distribution) or the model is insufficiently robust to produce an accurate sample for that number of scenarios. Under those conditions, many actuaries would consider modifying the parameters and generating another set. In addition, an actuary could introduce constraints, such as no negative interest rates or no rates less than 10 basis points. According to the 2012 survey of appointed actuaries, about two-thirds of those using stochastically generated interest rates impose a floor of zero percent or higher, while 31 percent of this same group impose a cap on the maximum interest rate, generally ranging from 18 to 28 percent. Similarly, 16 percent of all respondents said they apply some sort of yield curve normalization if the initial yield curve is unusually sloped.

Some actuaries, based upon the “moderately adverse” testing framework of asset adequacy analysis, believe that there are some situations where unreasonable scenarios

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can be excluded or de-emphasized when analyzing results (i.e., when those scenarios cause the overall result to include more margin than necessary to cover conditions that are considered moderately adverse).

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### Section F: Modeling Considerations—Assets

#### Q39. What types of assets are used by actuaries in asset adequacy analysis?

The actuary may need to select certain assets for testing from a total portfolio of available assets. For example, assets backing a product are typically greater than the product liabilities, due to existence of surplus, although assets equal to liabilities are used for testing. When faced with a choice, some actuaries select assets with reasonably predictable cash flows and lower market value volatility, rather than assets with highly uncertain cash flows or very volatile market values, such as securities with equity characteristics. Thus, some actuaries regard cash and fixed-income securities in good standing as the preferred choices. Fixed-income securities include most bonds, preferred stock, and mortgages, as well as various types of securitized and structured obligations. Equity real estate with stable rental income characteristics also typically has the attractive features of a fixed-income security, although its market value may be volatile. Nonperforming collateralized instruments such as mortgages in foreclosure generally have predictable cash flows and market values (at least on a portfolio basis). Other asset classes that may be reflected include bank loans, securities lending, emerging market debt, and mutual funds.

While common stocks usually have fairly predictable cash flows in the form of dividends (on a portfolio basis), these cash flows are generally not the primary reason investors hold these instruments. Common stocks are usually held for their potential gain in market value, and most of the benefit of holding common stocks is realized when they are sold for a capital gain. Due to their substantial volatility in market value, even on a portfolio basis, and the possibility of extended periods of depressed valuations, many actuaries consider these instruments less suitable as investments to support most types of insurance liabilities, with the exception being designated funds for which the risk is passed on to policyholders on a transparent basis. As a result, many actuaries generally do not include common stocks in asset adequacy analysis. To the extent that common stocks are utilized, care should be taken to include additional scenarios that focus on the volatility of these investments.

Actuaries may choose to consider using derivatives in their analysis if the company holds such instruments to hedge risk arising from certain product designs, such as equity-indexed annuities, guaranteed benefits associated with variable annuities, payout annuities with guaranteed minimum interest rates, or other products with long-term interest rate guarantees (e.g., long-term care). This can be especially appropriate where such derivatives are integral to managing the risks for these products. From the 2012 survey of appointed actuaries, between 12 and 24 percent of the respondents indicated that they use the following derivatives in their models: hedge funds, floating rate notes, options, swaps, swaptions, and caps/floors.

When determining what asset types to include in their reinvestment models, the survey respondents indicated that they employed a similar rationale to that described above. Most

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typically, combinations of fixed-income securities are used in relative proportion to the makeup of the existing portfolio with heavier emphasis placed on the makeup of recent purchases. This reinvestment assumption would typically be discussed with the company's investment managers.

### **Q40. How are policy loans treated in asset adequacy analysis?**

Approximately 70 percent of the survey respondents indicated they model policy loans by assuming the loan balances remain proportional to the cash value throughout the projection. Approximately 10 percent assume policy loan balances reflect the interest rate scenario dynamics, and approximately 10 percent do not include policy loans in their testing. The remaining 10 percent use other approaches.

### **Q41. What software platforms are used by appointed actuaries to model assets?**

From the 2012 survey of appointed actuaries, nearly 20 different types of software purchased from outside vendors were listed as being used for at least a portion of their asset portfolio. For the majority of asset classes, 45 percent used the same software to project existing asset cash flows that is used to project liability cash flows, with 52 percent stating that existing asset cash flows are projected externally and then brought into the liability projection system as fixed-scenario-dependent cash flows. Many actuaries use a combination of software purchased from multiple vendors and/or purchased software plus internally developed spreadsheet systems to project assets depending on the type of asset being projected.

When using purchased software to project asset cash flows, actuaries often check the parameters set by the vendor to ascertain whether the parameters are reasonable relative to the company's experience and asset characteristics, which can vary materially by company. If the actuary determines that the default software parameters are not appropriate for the company, the actuary may exercise professional judgment and make discretionary adjustments to them.

### **Q42. How is asset management strategy modeled for asset adequacy analysis?**

Asset management strategy varies significantly from one company to another. Some companies use a fairly passive strategy, holding securities they purchase for lengthy periods of time. Others might take advantage of capital gain opportunities to earn additional returns, at least in the short term. The actuary generally determines whether and to what extent to reflect the company's asset management strategy in the cash flow model. Considerations may include identifying how consistently the stated strategy has been followed in the past and how recently the strategy has been reviewed and approved by senior management, coupled with actuarial judgment as to the likelihood that the strategy will be followed under the scenarios being projected.

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Most insurers adhere to a predetermined investment strategy, stated in terms of allocation to various classes of assets, quality rating of securities purchased, sector allocations, and duration of the portfolio. If the overall strategy is followed consistently and the liability structure remains the same, securities sold will generally be replaced by instruments of similar characteristics, except for temporary deviations to take advantage of market opportunities. However, if the future asset management strategy is expected to vary significantly from the past and the portfolio composition is likely to be affected significantly as a result, many actuaries believe it is preferable to reflect this in the model.

Some actuarial software permits the modeling of specific investment strategies, such as duration matching. In this case, the allocation of assets to various instruments within the generic reinvestment portfolio usually is determined dynamically, based on the durations of the assets and liabilities. Dynamic allocations may be made to achieve a desired mix of assets after the period's purchases are made.

Where static allocations are used, the actuary typically considers certain potential resultant problems. For example, the regular purchase of a constant mix of short and long assets may result in holding what would appear to be an excessive percentage of long assets, because maturing short assets are replaced with this constant mix of short and long assets while the long assets held have not yet matured.

### **Q43. How is the reinvestment strategy modeled?**

Net positive cash flows arise from future premiums and deposits, interest earnings, asset maturities and sales, and other cash inflows, net of policy or contract benefits, expenses, taxes, and other cash outflows.

Net positive cash flows are generally invested in the model. The most common practice is to construct a simple "reinvestment" portfolio consisting of a small number of securities that collectively represent the quality, duration, and asset class characteristics reflecting the company's investment strategy.

The yields on these instruments generally are determined dynamically based on the interest rate scenario, using yield spreads reflecting the credit quality and embedded options of these instruments, with the intention that yields produced reflect the economic conditions within the scenarios tested.

In terms of the asset classes modeled, approximately 60 percent of the 2012 survey respondents said they model non-callable public corporate bonds. Other asset classes that were commonly modeled (where 20–25 percent of the survey respondents indicated they model these asset classes) are Treasuries, non-callable private corporate bonds, Government National Mortgage Association (GNMA) and Federal National Mortgage Association (FNMA) securities, common/preferred stock, and commercial/agricultural mortgages.

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The 2012 survey results indicated that 90 percent of the respondents employ a consistent reinvestment strategy across scenarios. (For purposes of the survey, a strategy that can be expressed regardless of economic environment, such as duration match or target portfolio mix, was considered consistent. A strategy that is different simply because rates are high or rising, rather than low or falling, was not considered consistent.)

### **Q44. What spread assumptions (i.e., spreads to Treasuries) are used to model reinvestments of fixed-income securities?**

Approximately 50 percent of the 2012 survey respondents indicated they use current spreads grading to historical spreads, while approximately 25 percent use current spreads and approximately 15 percent use historical spreads. About 5 percent aligned spreads to the default assumption basis (e.g., if historical defaults were used, so were historical spreads).

Some actuaries believe it is appropriate to set spreads on a basis that is consistent with the default assumptions, which means if historical defaults are used, then perhaps historical spreads might be used. Similarly, if current defaults are used, then perhaps current spreads might be used.

During the 2008 financial crisis, spreads widened considerably, which prompted some actuaries to rethink the use of current spreads for CFT purposes. Other actuaries considered the widened spreads created by the crisis as consistent, given the increased uncertainty relative to Treasuries, and as an appropriate spread to maintain while higher levels of defaults are being considered in the projections.

### **Q45. How is disinvestment modeled?**

When negative cash flow arises in the model, actuaries use a number of different approaches. Most actuaries model a disinvestment strategy that is largely consistent with company practice, as modeling limitations or the requirement to exclude new business in asset adequacy analysis may make an exact replication of the company's policy difficult to implement.

For small shortfalls, many actuaries assume the shortfall can be covered by short-term borrowing at the prevailing short-term rate applicable to the company, based on its credit standing. The actuary might then assume that all subsequent positive cash flows would be used first to repay the loans.

Many actuaries believe that large shortfalls are best modeled by selling assets. One common assumption is that sales will occur from liquid investments with low bid-ask spreads, consistent with the actual practice of most investors. If no consistent pattern of liquidation practices exists at the company, a pro-rata liquidation of all liquid investments



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might be assumed. Many companies use a pro-rata approach on asset sales because it is difficult to predict specific assets that will be sold, and a pro-rata portion would leave the asset makeup (duration, etc.) consistent with the makeup prior to sale. Another common assumption is a prioritized liquidation: For example, one possible order of priority might be money-market investments and T-bills first, followed by Treasury notes, Treasury bonds, agency issues, high-quality corporate bonds, high-yield issues, and real estate.

In reviewing results that combine reinvestment and disinvestment strategies, many actuaries believe it is appropriate to examine any distortion of results due to unrealistically large amounts of borrowing or unrealistically large concentrations in certain asset categories.

In instances where there is a large amount of borrowing, the actuary would typically consider estimating the impact of any unintended arbitrage advantage on margins or adjusting the reinvestment or disinvestment assumption to reduce the borrowing. For example, the actuary may want to check that the rates are consistent with the market scenarios so that the projections are not benefiting from an unintended arbitrage advantage. For instance, when separate projections are run for two lines of business and one generates positive cash flows while the other generates negative cash flows, it may make sense to borrow at the average reinvestment rate (which implicitly assumes that the loan is being made from one line to the other and reduces arbitrage advantage). Another alternative is to presume “internal borrowing,” in the case where cash flows are computed separately for several lines of business, and one line forecasts negative cash flows but the rest show consistently positive cash flows.

### **Q46. What are the sources of guidance on how to select assumptions for asset modeling?**

The ASOPs provide the most authoritative professional guidance on the general considerations to take into account in selecting assumptions but do not address specifics. The practice notes are also helpful, especially from the perspective of providing information on what other actuaries facing similar issues are doing. *The Dynamic Financial Condition Analysis Handbook*, prepared by the SOA, offers valuable information. SOA professional actuarial specialty guides on asset-liability management and life insurance company investments are useful references.

Rules and requirements set by regulators (e.g., the NAIC and New York Regulation 126) may provide more specific guidance and, due to their binding legal nature, may supersede guidance derived from other sources. Historically, regulatory guidance and rules have covered assumptions on default rates for various types of assets and conditions under which the AVR might be used. For example, New York Regulation 126 indicates that, in the absence of credible data, default losses of not less than 10 percent of AVR maximums may be assumed.

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Where the data appear to be credible and it can be reasonably expected that the experience will continue in the future, many actuaries rely upon internal company experience in selecting assumptions. The historical patterns might be adjusted for anticipated economic conditions (e.g., the economy is heading for a downturn) and expected future changes in company practices. It may also be appropriate to grade company experience into industry- or economy-wide experience, particularly in those cases where the company experience has been substantially better than industry average, unless the actuary has determined that the reasons for the superior experience are expected to continue.

In those cases where the company's own data are not credible or are unavailable, many actuaries use an industry- or economy-level assumption. Data from credit rating agencies are commonly used. Current credit loss experience is frequently studied in the academic literature, and current data can be obtained from a literature search. Credit spreads, historical interest rates and yield curves, and other economic data (inflation, employment, gross domestic product) are widely available data series. Actuaries often select their modeling assumptions based on this data.

In the case of highly complex instruments such as collateralized mortgage obligations (CMOs), actuaries frequently rely on models and assumptions constructed by vendors. Investment professionals with expert knowledge of assets construct vendor models that are generally proprietary (i.e., the details are not available to the user). Many actuaries believe it is appropriate to examine the results of these models to evaluate their reasonableness.

From the 2012 survey of appointed actuaries, a little more than half (51 percent) indicated they use published experience as a primary source of information for asset default, while about one-fifth (22 percent) use their own company experience. One-third of those surveyed (33 percent) use a blend of the two. Of the respondents, 13 percent use information from external advisers (such as investment banks), which is commonly proprietary to the adviser and nonpublic. Only 3 percent of survey respondents use the AVR contribution factor as an asset default source, likely reflecting the increased availability of relevant published asset default data and the fact that the AVR contribution factor is not revised to reflect dynamic market conditions.

### **Q47. What are the main asset-specific characteristics that affect cash flows?**

Fixed-income securities have contractually promised cash flows. However, the amount and timing of the cash flows can be impacted by credit losses and options embedded in the securities. Among other considerations, credit losses are related to the current and anticipated future creditworthiness of the issuer and the degree and quality of collateral. Credit losses, particularly for issues of lower quality, are generally correlated with business cycles.

The extent of the impact of options on the amount and timing of fixed-income cash flows generally depends on realization of conditions under which it is attractive for the debtor to

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exercise the options and the behavioral characteristics of the debtor with respect to the exercise. Common options encountered allow the early or delayed repayment of some or all of the principal; the attractiveness of exercising these options generally depends on the interest rates at the time when the options become exercisable and the availability of economically favorable refinancing options for the debtor. Prepayment behavior is difficult to model and depends on a number of factors other than the relationship between the coupon rate on the debt and the prevalent market rate.

For equity-type assets, which might include equity in physical or financial assets, there are often no contractually predetermined cash flows. Nevertheless, certain cash flows occur with some predictability, such as payment of dividends on stocks. The bulk of the cash flows on most equity securities is realized as capital gains or losses upon sale, and the central issue in modeling these instruments usually is the pattern of change in market values, which drives the capital gains and losses. Many factors impact stock values, including overall market movements and the beta of the stock. The Academy report to the NAIC, *Recommended Approach for Setting Regulatory Risk-Based Capital Requirements for Variable Products with Guarantees (Excluding Index Guarantees)*, presented in 2002,<sup>5</sup> includes significant analysis of stock market movements. In addition, equity modeling approaches described in AG43 may also provide helpful guidance for asset adequacy analysis purposes.

Cash flows on derivatives are mathematically related to the value of the underlying instrument or index and the terms of the derivative contract.

### **Q48. What types of asset-embedded options are modeled for cash flow testing?**

The 2004 survey of appointed actuaries had indicated that more than 80 percent of the respondents model asset optionality in at least one asset type. The 2012 survey asked appointed actuaries what were the primary sources of information for asset calls and prepayments, the two critical assumptions for modeling asset optionality. A plurality of companies (37 percent) use software algorithms from third-party software vendors as their primary source of asset calls and prepayments. An additional 32 percent of companies use either company experience (10 percent), published experience (8 percent), or a combination of the two (14 percent). Another 16 percent of appointed actuaries use judgment of investment experts in the company as their primary source of call and prepayment information.

In addition, the 2012 survey indicated that 11 percent of the respondents model asset prepayments stochastically.

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<sup>5</sup> Located at [http://www.actuary.org/pdf/life/rbc\\_16dec02.pdf](http://www.actuary.org/pdf/life/rbc_16dec02.pdf).

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### Q49. How are bond options modeled?

Options commonly found in bonds include calls, conversions, and puts.

A callable bond allows the issuer of the bond to prepay the bond under certain conditions by paying a call premium to the company. The likelihood of exercise generally depends on the relationship of the call price (and associated expenses to execute the call) to the present value of remaining coupon and principal payments, based upon the characteristics of the bond and other economic factors.

Generally, a call option “at the money” is not exercised due to the cost that an issuer might incur to refinance the debt. It is a common practice to model calls only if the option is “in the money” by a certain amount. This level is generally based on internal studies.

Many bonds are callable at a “make-whole” premium, which means the issuer will pay the holder an amount to compensate for any loss when the bond is called. It is a common practice to model these bonds as noncallable.

If callable bonds are an insignificant part of the portfolio, the impact of the call feature is usually excluded from consideration. What constitutes “insignificant” usually depends on the size of the callable bond portfolio in relation to the total portfolio, the characteristics of the callable bonds, and the size of the potential gain or loss if the bonds are called.

As a practical matter, it is difficult to model conversions, and it is usually conservative to treat a bond as if it were not convertible.

Not many bonds have put options, which give the bondholder the right to put the bond back to the issuer for cash. Some actuaries take the conservative approach of not modeling put options.

### Q50. How are expected credit losses on bonds modeled?

A significant majority (93 percent) of the respondents to the 2012 survey of appointed actuaries indicated that they use available quality ratings of a security as a factor in varying the credit loss assumption. It is a common practice to model each bond issue separately. An annual default loss is usually assumed, based on the current quality rating.

Some actuaries take business cycles into account by increasing the assumed default loss for the next few years if it appears that the economy is about to enter a recession or is in the middle of one, and grading down to a long-term average thereafter. Some actuaries also reflect quality rating movements over time, using default loss assumptions that change with these changes in rating. These “rating transitions” are studied extensively by rating agencies, with the results generally published annually. For high-quality bonds, this transition effect will increase default losses over time. For low-quality bonds, default loss rates may actually decrease over time for the remaining bonds that survived the higher

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default rates of the earlier years of a projection.

In the 2012 survey, approximately 17 percent of survey respondents indicated they model transition of asset quality ratings over time.

With respect to private placement bonds, default losses by quality are available from regularly published SOA studies. To date, these studies have shown private placement loss experience to be similar to that of public bonds at the same quality rating. The latest study showed private placements with somewhat higher default probabilities, but somewhat lower loss severities, with a similar overall loss by quality.

With respect to mortgage loans, default losses by rating are available from published studies. Approximately 69 percent of the 2012 survey respondents indicated they had mortgage loans in their companies' investment portfolios that require modeling. Of those with mortgage loans, approximately two-thirds changed their default assumptions for mortgages since 2007. The changes varied, but the most common change was methodology that increased defaults following the financial crisis, then decreased defaults following the economic recovery to historical averages or current experience.

Default losses involve lost interest and principal (net of recovery). Interest loss can be modeled as a reduction to coupon cash flow. Anticipated loss of principal can be modeled as an adjustment to the carrying value of the bond at the time of default. Actuaries also model these two components together by assuming a net reduction to yield as a result of default losses.

For bonds in default, no coupon payments are typically included in CFT. The market value of bonds in default is indicative of the recovery expected and reflects the expected amount of recovery, as well as the uncertainty in the recovery amount, through the implied discount rate. For practical purposes, a defaulted instrument is akin to an equity investment and is subject to the modeling difficulties that are present in equities—factors that are reflected in the volatility of market values for defaulted bonds and their sensitivity to economic conditions. For the same reasons that many actuaries do not include equities in their CFT (see Q39), they sometimes do not include defaulted bonds.

In the 2004 survey, about one-third of the respondents indicated that they reflect their own company's experience in setting the default assumptions. The remaining respondents reported a variety of sources, with Moody's being the most common (50 percent), and others being Standard & Poor's, the Altman Z-score, data from investment advisers, and AVR contributions. In the 2012 survey of appointed actuaries, such historical experience was utilized by the respondents in a number of ways, including the following:

- Use historical defaults for all asset categories for the entire projection (38 percent)
- Use current default rates but grade to historical averages (20 percent). Grading periods varied from two to five years.

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- Use historical defaults but make adjustments to reflect default cycles related to the economic environment, such as the 2008 financial crisis (19 percent)
- Use current default rates based on recent company or industry experience, rather than historic average experience (9 percent).

#### **Q51. Do bond credit losses vary by interest rate scenario?**

It is a common practice to assume that default rates and recoveries do not vary by interest rate scenario, because studies have not established a strong link between the shape or level of yield curves and credit losses. There is usually a stronger link between yield spreads, defaults, and economic conditions, which is the reason some actuaries model higher default losses when weaker economic conditions are expected. Only 2 percent of survey respondents reported that they model asset defaults stochastically.

#### **Q52. How are variable rate bonds modeled?**

In practice, most variable rates are based on an index other than Treasury yield rates (on which CFT is usually based), such as the London Interbank Offered Rate (Libor). If variable rate bonds are material to the portfolio, it may be appropriate to devise a method to determine the reset coupons based on Treasury yields. Linear regressions of Libor vs. Treasuries often produce a good fit and are appropriate in many instances, though it should be noted that the Libor will be phased out in 2021. Any minor distortions are usually not a problem, especially if variable rate assets and liabilities are modeled consistently.

The considerations used in modeling prepayments on variable rate bonds, in general, are somewhat different from those for fixed-rate bonds. For example, prepayments may be more closely related to absolute interest rate levels than relative interest rates. In addition, bond issuers may be looking to refinance at fixed rates for a longer term than that of the variable rate bond.

#### **Q53. What are the relevant aspects of residential mortgages and securities collateralized by them (CMO/MBS)?**

While direct ownership of individual residential mortgage loans by insurance companies does exist, companies more commonly hold such assets in the form of a securitized arrangement. These arrangements pool multiple loans, the cash flows of which collateralize the security. The two main types of securitized arrangements are mortgage-backed securities (MBSs) and collateralized mortgage obligations (CMOs). About three-quarters of the 2012 survey respondents included CMOs and MBSs in asset adequacy analysis.

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The holder of an MBS investment receives the actual principal and interest payments from the underlying residential loans in the pool as a direct pass-through (net of servicing and other similar deductions). Some MBSs (e.g., GNMA, FNMA, and Federal Home Loan Mortgage Corporation (FHMLC) pools) contain guarantees on the principal and interest payments, backed by the respective agency. Losses are generally more significant on nonagency issues, and may warrant incorporation into the model so as to reflect the potential impact of such credit losses in the analysis. While the agency issues are very highly rated and not as subject to losses, it is still common to assume a nominal basis point reduction.

CMOs are structured securities that break up the total principal and interest payments from the pooled loans into components, or “tranches,” with each tranche sold as a separate investment. There are many types of CMOs, with various levels of risk, depending on the type of tranche. Types of tranches include, but are not limited to, sequential pay, accrual, floater, planned amortization class (PAC), PAC support, target amortization class principal only, and interest only.

### Q54. What are the key risks associated with CMOs and MBSs?

MBS and CMO investments exhibit cash flow uncertainty due to both defaults and cash flow variation, as payments to the insurance company are directly impacted by the prepayment activity of the underlying pool of mortgages.

#### *Prepayment and Extension Risk*

In general, as interest rates decline, there exists *prepayment risk*, a specific type of reinvestment risk that cash flows will arrive earlier than planned (due to higher prepayments), and the proceeds are subject to reinvestment in lower-yielding assets. As rates rise, there exists *extension risk*, wherein cash flows arrive later than planned (due to fewer prepayments) and the insurance company cannot reinvest to take advantage of the higher rate environment. Prepayment speeds for an MBS depend on many factors, including the differential between the coupon rate of the underlying mortgages and current market rates and seasoning of the mortgage pool, among others. CMO cash flow variations can be impacted by these factors, as the prepayment activity of a particular tranche depends upon the prepayment activity of all the higher-priority tranches. Future cash flows on MBSs and CMOs typically are critically affected not only by the interest rate paths in the future, but also by the entire history of interest rates and cash flows since initiation of the underlying pool of mortgages.<sup>6</sup>

Due to the large impact this can have on a company with a significant investment in these securities, and the complexity of many of these instruments, regulators are often

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<sup>6</sup> For more discussion of the factors that impact prepayment speeds, see *The Handbook of Fixed Income Securities*, by Frank J. Fabozzi.

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particularly sensitive to the proper modeling and evaluation of the risk of MBS and CMO investments.

### *Default Risk/Credit Losses*

If a company holds a large portfolio of unsecuritized residential mortgages, modeling the default effect in some detail may be appropriate. As a result of the 2008 financial crisis, loss of principal became a more significant concern, even for residential mortgages that were adequately collateralized, due to widespread foreclosures. Historically, for GNMA or FNMA/FHLMC issues, one common practice was to assume a zero default rate, due to the guarantee of principal and interest by these agencies, which are considered to have direct or indirect government support. The same applied for structured securities such as CMOs, which generally have AAA ratings and may also be supported by credit enhancements. The 2008 financial crisis brought plausibility to the notion of default of these assets, and as such, actuaries have included nonzero default rates (especially FNMA/FHLMC), either in the base asset adequacy projections, or have layered on for sensitivity purposes. A substantial drop in market value of the underlying property can occur in certain economic scenarios and in some locations, which could impact asset adequacy results if the company's disinvestment strategy involves asset sales.

### **Q55. What typically constitutes an adequate CMO model?**

The desired sophistication and accuracy of a CMO model used for cash flow projections generally depends on the materiality of the CMO holdings in the portfolio and the expected volatility of the CMOs held. A suitable model generally will have, as a minimum, the following model features:

- Cash flows of the modeled tranche are dependent (if appropriate) on cash flows of other tranches; and
- Prepayment rates are dynamic over time and vary as interest rates change.

A significant challenge in modeling CMOs is the lack of readily available data on CMO structures after issue, as a company may not have the ability to see all tranches. Therefore, it is common for actuaries—particularly those at companies that have a large exposure to CMO issues—to obtain CMO cash flows for each interest rate scenario from an independent vendor.

Cash flows supplied by recognized vendors generally satisfy both of the above features for a suitable model. Specifically, because of the dependency of a tranche's cash flows to preceding tranches, it is often necessary to model not only the tranches a company owns but also the preceding tranches. This, combined with the additional complexity that is required to model appropriately cash flows from CMOs, makes obtaining a high level of robustness generally not feasible without subscribing to the databases of a recognized vendor that covers a comprehensive universe of CMO issues. Because the modeling



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algorithms utilized by these companies are typically proprietary, it is often difficult to get the necessary information to review the cash flows or adequately describe them for summary documents.

However, use of a vendor does not guarantee that a particular tranche can be modeled directly. As a result, the cash flows for CMO holdings may be generated for each individual security (when available) or for representative CMO securities based on groupings of CMO assets with similar cash flow characteristics (when individual security modeling is not available). The actuary may choose to use grouping methods for CMO assets that are not included in the system's database of CMOs. Also, vendor systems may not include all Committee on Uniform Securities Identification Procedures (CUSIPs) numbers in their databases. An approach to take these into account is to assume these nonincluded assets have like characteristics (including paydowns) similar to other tranches in the portfolio.

Validation techniques are available to companies using an internally generated model. One method of testing the suitability of an internally generated model is to compare results over different scenarios for a sample of assets, with the results projected by CMO databases and systems operated by broker-dealers or independent vendors. A second method that can provide insight is to compare the cash flows that would have been used in testing one year ago with the actual cash flows received in the past year from the CMOs.

#### **Q56. What are some considerations for modeling prepayment assumptions for securities collateralized by residential mortgages?**

Following is a list of some of the items that the actuary may choose to check for reasonableness.

- The prepayment rate generally rises as interest rates decrease, and such changes typically follow an S curve or arctangent-curve (likewise, the prepayment rate typically slows as interest rates increase).
- Prepayments are generally slower for lower coupon collateral and faster for higher coupon collateral.
- Prepayment rates usually vary by type of collateral (GNMA versus FNMA/FHLMC; 15-year versus 30-year; new versus seasoned mortgages, fixed versus floating rate<sup>7</sup>).

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<sup>7</sup> Base prepayment rates on floating-rate mortgages appear to be higher than those on fixed-rate mortgages, perhaps because some floating-rate mortgage holders may be waiting for the most efficient time to convert to a fixed-rate mortgage or they are more sensitive to or aware of changes in interest rates. The actuary may

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- Prepayment rates are usually consistent across CMOs with comparable collateral.
- Prepayment rates for the level-interest-rate scenario bear a reasonable relationship to street median PSAs or historical PSAs (PSAs are those from the Public Security Association Standard Prepayment Model<sup>8</sup>).
- Prepayments may slow due to the “burn-out” factor—those mortgage holders who watch interest rates closely tend to prepay when interest rates are first lowered, while those remaining may not react as much to subsequent interest rate changes.

The validity of the cash flow analysis relative to CMOs and MBSs typically depends, to a large extent, on the validity of the prepayment model. Typically, the actuary generally is not trying to predict a specific prepayment rate as much as trying to correlate prepayment rates with changes in interest rates and other economic variables. The actuary’s primary objective typically is to ensure that the correlations are reasonable. Validation techniques employed in practice are to compare the results of the model of a sample of mortgages under various interest scenarios, to confirm the direction and magnitude of movement. Also, comparing the relative sensitivity of several mortgages under a particular scenario, both using the model that is generating cash flow for asset adequacy as well as outside systems, is prevalent.

In order to understand the sensitivity of cash flow models to changes in parameters, the actuary may choose to evaluate the sensitivity of results to the prepayment function. If the company has a material exposure to CMOs, sensitivity testing with respect to the prepayment function may be appropriate in order to evaluate the sensitivity. Some actuaries alter the base prepayment rates in their models as a result of this sensitivity testing.

### **Q57. What are some common methods for determining the market value of CMOs and MBSs at a future point in time?**

For fixed-income securities, the current market value is the present value of anticipated cash flows (discounted at a rate reflecting the current yield curve and the credit quality of the instrument), plus the value of the embedded options. The options available in the underlying pool of mortgages can have a significant impact on CMO/MBS values, and

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choose to evaluate the sensitivity of indexed tranches with regard to the link of the index to the scenario interest rate.

<sup>8</sup> These rates represent an assumed monthly rate of prepayment that is annualized to the outstanding principal balance of a mortgage loan. The PSA model is one of several models used to calculate and manage prepayment risk. The PSA model acknowledges that prepayment assumptions will change during the life of the obligation and affect the yield of the security. The model assumes a gradual rise in prepayments, which peaks after 30 months. The standard model, called “100 percent PSA,” starts with an annualized prepayment rate of 0 percent in month zero, with 0.2-percentage-point increases each month until peaking at 6% after 30 months.

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valuing these options is difficult. In addition, calculating market values for future points in time may be appropriate if a significant amount of CMOs and MBSs are modeled as being available for sale over the projection period.

Actuaries who model the market value of these assets may use different methods. The following are three such approaches that involve projection and discounting of future cash flows:

- An option pricing approach involving stochastic projections for each market value calculation. Some types of actuarial modeling software support this method, although their use can result in slow run times. Hence, some actuaries only use this approach if it is important to the assessment of asset adequacy, if alternative methods are unsuitable, and perhaps only for judiciously chosen scenarios.
- Similar to a stochastic method, but using just one scenario. It assumes that the interest rates remain level from the point being valued.
- Using the cash flows generated for the CFT scenario, so no additional projection of CMO cash flows is made.

#### **Q58. What are the relevant aspects of commercial mortgages?**

Commercial mortgages are loans collateralized by income-producing commercial properties, such as apartment buildings, shopping centers, hotels, or office buildings. While pooling and considering the risk and cash flow characteristics on a portfolio basis is common procedure in the case of *residential* mortgages, a case-by-case analysis is sometimes preferable for *commercial* mortgages because the large size of an individual loan and the unique features of the properties have an important effect on the risk and cash flow. However, some actuaries use the conclusions of the analysis at an aggregate level in CFT.

There are three important aspects in which commercial mortgages generally differ from residential mortgages. First, commercial mortgages usually have some level of call protection or “make whole” provisions. These can take the form of prepayment lockout periods, defeasance provisions, prepayment penalty points, or yield maintenance charges. The second major difference is that commercial loans are usually not fully amortized over the duration of the loan term. As a result, there typically is a significant balloon (or extension) risk at the end of the term. The implications of this risk for modeling purposes will be addressed in the following question. Lastly, a higher percentage of commercial mortgages tend to be adjustable rate when compared to residential mortgages.

Components of commercial mortgages can be restructured into commercial mortgage-backed securities, as either pass-throughs or pay-throughs, with the latter having tranches that redistribute cash flows in a variety of patterns and create a variety of credit risk levels.

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### Q59. What are the risks associated with commercial mortgages?

As with most types of fixed-income securities, many actuaries believe that the key risks can be categorized in the following ways:

- *Credit quality (tenant quality, occupancy rates)*

Given the case-by-case nature of commercial mortgages, often the actuary will examine trends in cash flow and occupancy, lease terms, and profitability of underlying tenants prepared by the company's investment department to gain better understanding.

- *Reinvestment risk or extension risk*

While there is usually more prepayment protection for commercial mortgages than for residential mortgages (due to prepayment lockout periods and make-whole provisions), there might be extension risk to be considered, with restructuring at below-market-yield rates. Evaluating restructuring risk based upon company and overall experience may help to ascertain reinvestment risk.

- *Concentration risk (location, number of properties, use)*

Actuaries typically evaluate documentation provided by the company's investment department.

- *Interest rate risk*

Because many commercial mortgages are adjustable rate, companies run the risk of loss of coupon income as a result of falling interest rates.

- *Liquidity risk*

While yield degradation assumptions can provide an adequate measure of the amount of expected losses, actuaries providing services to companies with significant mortgage holdings or with a significant need for liquidity may choose to consider incorporating additional sensitivity tests in their CFT. For example, some studies have shown that the time from initial default to ultimate disposition is around three years. In a depressed environment, it may be reasonable to assume either a longer time period or a lower price at disposition.

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### Q60. What are some approaches used to model default losses on mortgages?

The *Mortgage Loan Portfolio Profile*, published quarterly by the American Council of Life Insurers (ACLI), has extensive information on a high percentage of the life insurance industry's mortgage loans, including commercial, one- to four-family, and agricultural loans. Property type and geographical distributions are shown, as are delinquencies, loans in process of foreclosure, restructured loans, and completed foreclosures. The actuary may choose to refer to this profile to evaluate industry experience and as a basis for comparison to company experience.

Spreads to Treasuries for commercial mortgages are available on a monthly basis from the Barron's/John B. Levy & Company National Mortgage Survey. Spreads wider than historical averages may be indicative of anticipated unfavorable experience. In this case, the actuary may choose to make some upward adjustments to default loss assumptions, perhaps grading to long-term averages over a reasonable period.

Research done in the course of development of mortgage RBC factors found default experience typically to be most closely related to a contemporaneous loan-to-value ratio. This ratio differs from a typical loan-to-value ratio in that the loan is valued at current interest rates before being compared to its current property value. Debt-service-coverage ratios are also usually a significant factor in estimating mortgage losses. An actuary who uses this type of ratio in projecting default losses may also choose to develop and use a mortgage quality rating system.

About two-thirds of those responding to the 2012 survey reported using their company's own experience in selecting the default loss assumption for mortgages. Some reported using a combination of company and external data. A variety of published external sources related to the mortgage sector were used by respondents, such as ACLI, Bloomberg, and Moody's. The most common factors by which the survey respondents varied mortgage losses were quality of the investment, year of projection, performing vs. nonperforming asset, and yield spread.

### Q61. How is existing foreclosed real estate modeled?

Most actuaries exclude real estate due to the higher volatility of rental income. If real estate is included, many actuaries prefer to analyze foreclosed real estate on a property-by-property basis. While the results of such analysis typically may be summarized at an overall level that can be used for asset adequacy analysis, possible variations in the risk characteristics by property may be too great to make the use of broad-based assumptions feasible. This can be more important if the amount is expected to have a material effect on results. Because of the inherent difficulties and limitations in analyzing foreclosures, often these assets are excluded from asset adequacy analysis, if possible.

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### **Q62. How might limited partnerships be evaluated?**

Limited partnerships can serve different purposes. Some limited partnerships are designed such that complex or capital-intensive assets (energy, commodity, real estate) are placed into special purpose vehicles potentially to provide potential capital relief, with an income stream based upon the underlying assets. Others may relate to an equity interest in an entity.

The varied nature of limited partnerships may lead some actuaries to consider whether inclusion is practical for asset adequacy analysis, or even appropriate for asset adequacy analysis. As an example, some actuaries believe that equity interests are best placed in surplus, and are therefore excluded from asset adequacy analysis. In some cases, because of the inherent difficulties and limitations in analyzing limited partnerships or the complex underlying assets, assets are removed from asset adequacy analysis due to practicality. If they are included, one method actuaries use to evaluate limited partnerships is to be consistent with the evaluation of such assets under RBC; i.e., to look through the limited partnership package to the underlying assets. Each asset would then be evaluated on its own merits.

### **Q63. What are the relevant considerations for asset-backed securities?**

As with MBSs and CMOs, it is common for actuaries providing services to companies with material holdings of asset-backed securities (ABSs) to use a vendor package to project cash flows. While certain types of ABSs do not have the interest rate sensitivity of other ABSs, MBSs, and CMOs, the data needed to track and project the underlying collateral often make using a vendor package a practical option.

As noted earlier in this practice note, even the best vendor packages may not cover 100 percent of a company's invested assets. The actuary may choose to map those assets not modeled to a similar asset, or the entirety of modeled holdings may be scaled up to approximate nonmodeled assets. Many actuaries prefer that the percentage of nonmodeled assets be small.

### **Q64. Are derivatives included in asset adequacy analysis, and if so, how are they typically modeled?**

Actuaries may choose to consider using derivatives in their asset adequacy analysis if the company holds such instruments to either hedge risk arising from certain product designs or to hedge risk arising from adverse macroeconomic or microeconomic outcomes. Consideration for inclusion of derivatives in asset adequacy testing may depend on the extent to which such derivatives are integral to managing the asset-liability risk profile for these products. Examples of product designs that may necessitate use of hedge instruments are equity-indexed annuities, guaranteed benefits associated with variable annuities, or fixed annuities with guaranteed minimum interest rates. In order to hedge

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macroeconomic and/or microeconomic risks, companies utilize interest rate swaps, swaptions, caps and floors, credit default swaps, and other options and futures. An example could be the use of swaps and swaptions to back interest rate risk on a block of long-term care business or immediate annuities.

Inclusion of derivatives in asset adequacy analysis varies in practice. For those companies that hold derivatives in their portfolio, 75 percent of the 2012 survey respondents included those derivatives held as of the testing date in asset adequacy analysis, and a subset of this group modeled future derivative purchases. Consequently, 25 percent of the companies that held derivatives as of the testing date did not incorporate those derivatives in asset adequacy analysis, possibly due to modeling difficulties.

If derivatives are deemed to be appropriate for inclusion in asset adequacy analysis, decisions need to be made on both a point-in-time (testing date) and projected basis. As of the testing date, a carrying value that is consistent with statutory values is desired, and would appropriately reflect various interest rate scenarios.

With regard to the projection, derivatives are typically modeled on a seriatim basis to recognize the timing of cash flows as well as each asset's characteristics. Some companies elect to use external vendor software to model derivatives. Testing is typically performed on deterministic scenarios for cash flow testing, although in some cases, and depending on the type of derivative, stochastic analysis is used. The underlying mechanics typically utilize various underlying models to price the optionality including Black-Scholes, the Black formula, other lognormal forward models, and similar approaches. The complexity of the models can vary significantly and typically are reliant on an actuary's input, comfort level with the formulae, and input from investment analysts. Materiality is another key consideration as to whether derivatives are included.

Finally, concerning documentation, some states may require detailed descriptions, modeling methodology, and output relative to derivatives included in asset adequacy analysis.

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## Section G: Modeling Considerations—Policy Cash Flow Risk

### Q65. What is policy cash flow risk?

Policy cash flow risk, as defined in both ASOP No. 7 and ASOP No. 22, is as follows:

The risk that the amount or timing of cash flows under a policy or contract will differ from expectations or assumptions for reasons other than a change in investment rates of return or a change in asset cash flows.

This risk is commonly referred to as C-2 risk, or pricing risk.

### Q66. How might the appointed actuary typically decide on the scope of policy cash flow risk testing?

A good first step usually is to identify the material or most significant policy cash flow risks. These risks may be identified through a review of sensitivity analyses from prior pricing and/or projection work, combined with the appointed actuary's general knowledge of the product line(s). In deciding on the scope of testing, many actuaries consider the potential volatility of future experience, the significance of any anticipated variance in terms of its effect on results (i.e., ending surplus), the existence of any known repricing capability for nonguaranteed elements, and any known interrelationships with asset, investment rate-of-return, or other policy cash flow risks.

The policy cash flow risks considered generally include mortality, morbidity, lapse, and expense risks, as well as any significant options held by the policyholder, such as interest rate guarantees, policy loan utilization, the flexibility to pay or not pay premiums, guaranteed minimum death benefits (GMDB), guaranteed minimum withdrawal benefits (GMWB), or guaranteed minimum income benefits (GMIBs).

While both favorable and unfavorable deviations in future experience are possible, given the “moderately adverse” framework of asset adequacy analysis, many actuaries believe the appointed actuary's primary focus regarding any policy cash flow risk is the potential for adverse deviation.

### Q67. What is meant by “sensitivity testing” for policy cash flow risk?

Sensitivity testing for policy cash flow risk involves the testing of non-asset-related variables under various scenarios to demonstrate the adequacy of reserves. After the completion of the testing of the adequacy of assets supporting specified liabilities under a basic set of scenarios (each scenario involving different economic assumptions that focus



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primarily on asset and/or investment rate-of-return risk), the appointed actuary choosing to do such sensitivity testing may perform additional tests. These tests incorporate, for each significant type of policy cash flow risk (where significant is defined by the appointed actuary), a range of variations from the base policy cash flow assumption. The range in value for each assumption is generally determined based on the actuary’s judgment of the reasonable possibility that such variations will occur. The basic economic scenarios generally are then rerun to determine the impact of such variation in the policy cash flow variables.

Certain sensitivity tests also can be run in order to evaluate the impact of adverse experience of more than one variable at a time.

**Q68. What type of sensitivity testing is commonly done?**

New product designs and benefits, and an increased recognition of the materiality of certain risks, have brought more focus on sensitivity testing, from both appointed actuaries and regulators. In the 2012 survey, respondents cited examples that have generated increased focus for sensitivity testing, including dynamic lapse parameters, interest or equity rates, reinvestment spreads, and payout annuity mortality.

From the 2012 survey of appointed actuaries, the following table gives the top 10 items most frequently sensitivity tested:

Lapse	91%
Life insurance mortality	80%
Expenses	71%
Asset defaults	57%
Payout annuity mortality	38%
Morbidity	36%
Interest or equity rates	36%
Reinvestment spreads	30%
Dynamic lapse parameters	27%
Premium persistency	20%

**Q69. What policy cash flows are typically sensitivity tested under a gross premium valuation?**

Sensitivity testing is usually performed for a GPV. Most respondents to the 2012 survey of appointed actuaries indicated that they perform sensitivity tests on the key variables for policy cash flows (e.g., expenses, lapses, mortality, and morbidity).

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**Q70. Do actuaries use their company’s own experience to set modeling assumptions for policy cash flow risk?**

Most actuaries use their own company’s experience, wherever possible, to establish the key assumptions related to policy cash flow risk. The following table summarizes the percentage of respondents to the 2012 survey of appointed actuaries who reported setting their key assumptions by either company experience, industry experience, both, or actuarial judgment. A response of “Not applicable” was also included to capture responses where an assumption was not considered relevant:

Assumption	Company	Industry	Both	Actuarial Judgment	Not Applicable
Lapse	66%	2%	20%	4%	7%
Mortality	42%	11%	38%	2%	7%
Disability and recovery	16%	15%	17%	1%	51%
Morbidity	24%	8%	19%	1%	48%
Dynamic policyholder behavior	19%	4%	11%	42%	25%

**Q71. When may the use of dynamic lapse assumptions be appropriate?**

Several factors can affect lapse rates for a product, including attained age, policy duration, level of surrender charges, sophistication of the market, qualified vs. nonqualified status, distribution system, and the difference between the rate credited on the policy versus rates that could be earned on other similar products in the marketplace. Certain products are known to have increased lapses when interest rates increase. When the product being tested is known to be interest-sensitive (e.g., fixed deferred annuities), the actuary may choose to consider the use of dynamic lapse assumptions—i.e., to vary the lapse rates from scenario to scenario and from year to year—based on the dynamics involved. For policies that are not interest-sensitive (e.g., disability income), actuaries would not typically use dynamic lapse assumptions.

In the 2012 survey of appointed actuaries, roughly 72 percent of those surveyed responded that they use dynamic lapse assumptions for interest-sensitive products that allow surrender, 7 percent responded that they do not use a dynamic lapse assumption, and 22 percent responded that the assumption was not applicable.

**Q72. How might the actuary address longevity risk in the setting of mortality and mortality improvement assumptions?**

Longevity risk is the risk related to the increasing life expectancy of policyholders, which may translate to higher-than-expected cash flows. As with most assumptions, the extent to

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which an actuary considers longevity risk in asset adequacy analysis depends upon the underlying products being tested, though products such as payout annuities, pension risk transfer business, and longevity swaps typically would be materially impacted by longevity risk.

A possible approach to setting assumptions for asset adequacy analysis may be to incorporate both a mortality table and a mortality improvement scale. Q70 references current practice in selecting mortality assumptions, focused more on base table assumptions. For improvement scales, there are standard industry tables available, both with and without margin. Some actuaries may choose to develop their own assumptions. Also, the actuary could include mortality improvement through a reduction in the base mortality rates.

The actuary may consider applying a margin to mortality tables and mortality improvement scales. There are available reference points for each. In selecting margins to apply to the mortality table, the actuary may consider the 10 percent margin generally included in annuity valuation tables. Larger margins may be appropriate for very small blocks of business, and smaller margins may be appropriate for larger blocks of business. For mortality improvement, Canadian valuation guidance<sup>9</sup> calls for a 50 percent margin for 25 years from the valuation date and zero percent thereafter.

Other considerations in addressing longevity risk in asset adequacy analysis are correlation of assumptions and sensitivity testing. Regarding correlation, the actuary may consider the relationship of margins on the base mortality table and the margins on the mortality improvement scale. Depending on the risks to be covered by these margins, the margins could be adjusted for correlation. For example, if the margin is intended to cover random fluctuation risk, there is likely not any correlation. However, if the margin is intended to cover the risk of a severe mortality event such as a pandemic, correlation may be considered.

On sensitivity testing, such scenarios may incorporate all types of risk with simple increases/decreases to base assumptions. Another approach is to evaluate specific components of the risk (e.g., pandemic, etc.) as described above. Sensitivity testing could help identify assumptions that are relatively more significant to the results and contain more variability, and therefore may involve relatively more analysis to develop.

At the time this practice note was published, additional information on longevity risk was located at <https://www.actuary.org/committees/dynamic/LRTF>.

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<sup>9</sup> *Guidance for the 2016 Valuation of Insurance Contract Liabilities of Life Insurers*; Canadian Institute of Actuaries; August 2016, page 7.

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### **Q73. What are “secondary guarantees” and what additional policy cash flow risks are associated with them?**

An account balance product is an insurance or annuity product that has an explicit visible account balance upon which surrender and other benefits depend. Typical account balance products include fixed and variable universal life and deferred annuities. For traditional account balance products, the continuation of benefits other than surrender depends entirely on the continuing existence of a positive account balance, as the costs for those benefits are charged directly against the account balance and the benefit is no longer available after the account balance drops to zero. A secondary guarantee may be extended to a benefit whose amount and/or duration may exceed that supported by the account balance. Examples of secondary guarantees include no-lapse guarantees on universal life insurance, and death benefits, maturity benefits, withdrawal benefits, and income benefits on annuities. Thus, the secondary guarantee adds the risk that the account balance will be insufficient to fund the guaranteed benefit. Therefore, secondary benefits require testing over various scenarios of interest rates and/or equity returns to ascertain whether the reserve is sufficient to fund the secondary guarantees.

### **Q74. What methods are used to perform asset adequacy analysis for products with secondary guarantees?**

ASOP No. 22 (Section 3.3.1) states the following in determining the approach for asset adequacy analysis:

The actuary should consider the type of asset, policy, or other liability cash flows, and the severity of risks associated with those cash flows, including the investment rate-of-return risk.

CFT methodologies are often used for products where future cash flows may vary under different economic or interest rate scenarios. For example, CFT may be used for a variable annuity with a fixed account option, or for one with a guaranteed minimum benefit design that varies materially by economic scenario, or for variable life business with significant death benefit guarantees or other secondary benefits in the general account.

Over the past decade, new minimum reserve regulations and guidelines for products with secondary guarantees have been introduced requiring multi-scenario projections and dynamic analysis to set the minimum reserve, replacing the deterministic formulaic approach for these products. This subject is addressed in more detail in Section L of this practice note.

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### Section H: Modeling Considerations—Expenses

#### **Q75. What kinds of expenses are modeled for asset adequacy analysis?**

In ASOP No. 22, gross premium reserves (Section 2.9), other liability cash flows (Section 2.16), and policy cash flows (Section 2.18) are all defined to reflect expenses.

The expenses to be considered typically include maintenance expenses, commissions, investment expenses, and overhead expenses associated with the liabilities to be tested.

ASOP No. 22, Section 3.3.4.c, states the following:

The asset adequacy analysis should take into account anticipated material cash flows such as renewal premiums, guaranteed and nonguaranteed benefits, **expenses**, and taxes [emphasis added].

#### **Q76. Must acquisition expenses be considered?**

ASOP No. 22 focuses on the cash flows arising from inforce business, which does not typically include acquisition expenses. Nevertheless, it is possible that a business in its first policy year may still have acquisition expenses associated with it, which would, therefore, usually be considered expenses related to the business being tested.

#### **Q77. How are expense assumptions checked for reasonableness?**

In the 2012 survey of appointed actuaries, nearly all responding actuaries indicated they set unit expenses based on their own company's experience. Other approaches used by responding actuaries included the use of pricing expenses or industry data (e.g., expenses from LOMA (formerly, Life Office Management Association), SOA studies, or the Generally Recognized Expense Table (GRET)).

A majority of respondents stated that they reconcile modeled expenses to the income statement. At least one state (California) requires an annual reconciliation of modeled expenses to the annual statement.

#### **Q78. Some pricing actuaries assume that expenses will decrease over time, as economies of scale are reached. May this be reflected in testing?**

Appointed actuaries sometimes reflect possible changes in future expense levels by splitting the expenses into fixed and variable components, with different assumptions for each. Another practice in use is to use pricing assumptions. If pricing assumes a decline in unit costs, a sensitivity test that assumes the level of expenses remains at the current level

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(i.e., does not decrease) may be performed.

ASOP No. 7, Section 3.5.2, states the following:

Considerations that might affect the projection include ... expense-control strategies...

### **Q79. Are insurance expenses generally adjusted for inflation?**

Eighty-one percent of the respondents in the 2012 survey stated that they adjust expenses for inflation. A common way to do this is to have per-unit expenses and/or per-policy expenses—i.e., those that relate to fixed expenses—increase with the level of inflation appropriate to each scenario. Of those in the survey who model inflation, approximately 45 percent indicated they use a flat inflation assumption for all scenarios and 55 percent indicated they vary the inflation rate by scenario. Certain expenses, such as those that vary as a percentage of reserves or account values, would automatically change as the level of reserves per policy changes over time. The level of inflation appropriate to a given scenario may be related to consideration of the long-term average real returns on the projected comparable investments.

### **Q80. Do actuaries perform sensitivity tests on the expense levels assumed in testing?**

ASOP No. 7 (Section 3.10.2) states that the appointed actuary

should consider and appropriately address the sensitivity of the model to the effect of variations in key assumptions.

For some products and/or companies, expenses may be considered a key assumption. In the 2012 survey of appointed actuaries, 71 percent of the respondents indicated they do some sensitivity testing on expenses. Those respondents further indicated that additional sensitivity tests are performed on inflation and investment expense assumptions.

### **Q81. How are overhead expenses commonly reflected in testing?**

There are many definitions of overhead expenses in use. Additionally, there are many opinions as to proper reflection of overhead to tested lines of business.

With respect to definition of overhead, some overhead expenses, such as management salaries, are typically viewed as recurring expenses. Other overhead expenses are extraordinary or nonrecurring. For example, some appointed actuaries would view expenses associated with the attempt to acquire a new block of business as extraordinary in nature, not as obligations of the inforce business being tested, but rather as being an

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obligation of the new block of business after it is acquired. Other actuaries point out that a similar level of extraordinary expense occurs each year and therefore include it as part of the maintenance expenses used in CFT.

With respect to reflection of overhead, the 2012 survey showed a fairly wide range of practices with respect to the allocation of overhead in testing models. The majority (73 percent) of appointed actuaries let unit expenses fully reflect all policy-related maintenance and overhead expenses. Others let unit expenses reflect the policy related expenses only and reflect overhead through a separate model or an on-top adjustment to the results. Still others do not reflect the overhead in the unit expenses at all.

#### **Q82. How are investment expenses typically handled in cash flow testing?**

There are several practices that have been observed:

- Develop investment expenses as part of their analysis of their company's total expenses and therefore do not explicitly model them.
- Develop formulas that only allocate such expense at acquisition and disposition of an asset.
- Develop a formula of investment expenses as a number of basis points per year, which are deducted from the earned rate for each asset type.
- Reflect investment expenses explicitly or use, in the projections, an earned rate that is already reduced by the investment expense assumption.

Regardless of the approach used, some actuaries check the reasonableness of their modeled investment expenses by reconciling to the annual statement or to other company data.

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### Section I: Reliance on Other Parties

#### **Q83. What is the relationship between the appointed actuary and those on whom the actuary relies?**

Prior to accepting the position of appointed actuary, or as soon as practicable thereafter, the actuary may choose to meet with the persons or firms upon whom the actuary intends to rely. The following documents contain guidance on reliance:

- ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*, Sections 4.3 and 4.4;
- 2010 AOMR, Sections 6B(3)-(5) and 6E; and
- ASOP No. 23, *Data Quality*, Sections 3.5 and 3.6.

Respondents to the 2012 survey of appointed actuaries indicated that reliance statements are typically received from the following:

- Company investment staff: 63%
- Senior company management: 47%
- IT or administrative staff: 46%
- Line of business actuaries: 34%
- External investment advisers: 15%
- Consultants: 7%
- Other (mostly third-party administrators, reinsurers, or accountants): 21%

Sensibly, the actuary will typically not rely upon a person for whom the actuary has a high degree of oversight and control of work product (e.g., an actuarial student who reports to him or her). Also, the actuary will typically not rely upon the company's external auditor, as per a Notice to Practitioners dated February 1991 from the American Institute of Certified Public Accountants:

The auditor should not consent to be referred to in an actuarial opinion in which the actuary expresses reliance on the auditor for the accuracy of the underlying data. If the auditor becomes aware that an actuary has expressed such reliance on the auditor, the auditor should advise the actuary that he or she does not consent to such reference, and the auditor should consider other actions that may be appropriate and may also wish to consult with legal counsel.



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### **Q84. What data reliability tests might the appointed actuary perform?**

The statement of actuarial opinion applies to all inforce business on the statement date. Tests of data reliability will typically depend upon the method used for asset adequacy analysis and whether the appointed actuary has relied upon others in developing data, procedures, or assumptions.

AOMR-recommended language varies with respect to what is included in the reliance as well as with respect to the extent of the actuary's review (refer to Q85). Tests of data reliability may include evaluation of data for reasonableness and consistency and reconciliation of the underlying records to applicable exhibits and schedules of the annual statement (e.g., Exhibits 5, 6, and 7; claim liabilities in Exhibit 8, Part 1; and equivalent items in the separate account statement).

Other references for tests of data reliability are:

- ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*;
- ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*; and
- ASOP No. 23, *Data Quality*.

### **Q85. Upon whom may the appointed actuary rely for substantial accuracy of records and information?**

Many actuaries believe that the person they are relying upon should have the necessary breadth and depth of knowledge with respect to the related subject matter. Section 6A(3) of the AOMR allows the appointed actuary to rely on other experts in developing data, procedures, or assumptions, supported by a statement of each such expert in the form prescribed by Section 6E. Section 6E states the following:

If the appointed actuary relies on the certification of others on matters concerning the accuracy or completeness of any data underlying the actuarial opinion, or the appropriateness of any other information used by the appointed actuary in forming the actuarial opinion, the actuarial opinion should so indicate the persons the actuary is relying upon and a precise identification of the items subject to reliance. In addition, the persons on whom the appointed actuary relies shall provide a certification that precisely identifies the items on which the person is providing information and a statement as to the accuracy, completeness or reasonableness, as applicable, of the items. This certification shall include the signature, title, company, address and telephone number of the person rendering the certification, as well as the date on which it is signed.

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Two types of reliance are mentioned in the AOMR:

- Reliance on other experts to develop certain portions of the analysis.
- Reliance on others with respect to the underlying asset and liability records.

Regarding the first type of reliance, if the appointed actuary has relied on other experts to develop certain portions of the analysis, Section 6B(3) of the AOMR provides language for the actuarial opinion. This reliance should be accompanied by a statement by each of the experts in the form prescribed by Section 6E. The appointed actuary may wish to take particular note of the sentence included in the recommended language: “I have reviewed the information relied upon for reasonableness.”

Regarding the second type of reliance, two alternatives for recommended language are provided, depending on the extent of the actuary’s review:

1. The appointed actuary has the option of personally reviewing the underlying basic records. In that case, recommended language is presented in Section 6B(4). Some actuaries are reluctant to take this responsibility unless they are also qualified auditors.
2. If the appointed actuary chooses not to review the underlying records and has relied upon data prepared by others, Section 6B(5) offers recommended alternative language for the actuarial opinion. This reliance would typically be accompanied by a statement by each person relied upon in the form prescribed by Section 6E. The appointed actuary may wish to take particular note of the following from the recommended language:

I evaluated that data for reasonableness and consistency. I also reconciled that data to [exhibits and schedules to be listed as applicable] of the company’s current annual statement. In other respects, my examination included review of the actuarial assumptions and actuarial methods used and tests of the calculations I considered necessary.

Regardless of the type of reliance, the accuracy and comprehensiveness of data supplied by others are the responsibility of those who supply the data.

See Q86-Q88 on the level of detail used by actuaries to review the underlying data records. Both ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers* (Section 4.3), and ASOP No. 23, *Data Quality* (Section 3.5) contain guidance governing the actuary’s obligations to satisfy herself or himself that data and analyses provided by third parties are reasonable and consistent. Other guidance and state regulations may also apply.

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**Q86. What level of detail is used to review the underlying liability inforce records from a third party?**

From the 2004 survey of appointed actuaries, 131 respondents answered this question as follows:

No review, just reliance from third party	14%
A limited, cursory review looking for glaring discrepancies	11%
A moderate review of reasonableness and consistency	73%
An in-depth analysis (audit level)	2%

Within the “moderate review” category, one or more of the following methods was used:

Verify inforce against company work papers	92%
Compare data with prior year for consistency	84%
Perform test to identify questionable values	45%
Other	1%

**Q87. What level of detail is used to review the underlying asset inforce records from a third party?**

From the 2004 survey of appointed actuaries, 130 respondents answered this question as follows:

No review, just reliance from third party	18%
A limited, cursory review looking for glaring discrepancies	26%
A moderate review of reasonableness and consistency	53%
An in-depth analysis (audit level)	3%

Within the “moderate review” category, one or more of the following methods was used:

Verify inforce against company work papers	90%
Compare data with prior year for consistency	85%
Perform tests to identify questionable values	60%

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**Q88. What level of detail is used to review assumption support from a third party?**

From the 2004 survey of appointed actuaries, 117 respondents answered this question as follows:

No review, just reliance from third party:	8%
A limited, cursory review looking for glaring discrepancies	11%
A moderate review of reasonableness and consistency	79%
An in-depth analysis (audit level)	3%

Within the “moderate review” category, one or more of the following methods was used::

Compare data with prior year analysis	87%
Compare assumptions with company data studies and analysis	80%
Other	3%

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### Section J: Analysis of Results

#### **Q89. What measures are commonly used to test reserve adequacy for the actuarial opinion?**

Among the respondents to the 2012 survey of appointed actuaries, 42 percent indicated they use the present value of ending surplus as the primary basis to determine reserve adequacy, while 50 percent focus on accumulated value. Still another 8 percent use other present values (such as present value of profits) as the primary basis to determine reserve adequacy.

Of the 92 percent who use either present value or accumulated value of surplus, 47 percent of survey respondents rely primarily on book value of surplus to determine reserve adequacy, 32 percent rely primarily on market value, and 13 percent use market value of assets minus book value of liabilities as their definition of surplus for this purpose.

One basis used by many actuaries is the estimated “ending net market value,” calculated by estimating the market value of assets at the interest rates in effect at the end of the scenario, and deducting the present value (as of the end of the projection, at the same interest rates) of the remaining projected benefits and expenses. This gives an estimate of the market value of ending surplus. Some actuaries assume that the remaining liabilities are lapsed for cash value with the liquidation of assets at market value to cover the cash surrender.

When asked how market value of liabilities (MVL) were determined, 35 percent of survey respondents answered that MVL was not relevant to their work. Of those for whom MVL was relevant, some respondents gave different answers for different lines of business, such that the following percentages add to more than 65 percent: 26 percent used cash surrender value, 20 percent used the present value of future cash flows (as of the end of the projection), and 4 percent used a gross premium reserve. Also, 32 percent said that they used the book value of liabilities or the statutory reserves as their proxy for MVL.

Some actuaries project the book values (as opposed to market values) until the remaining liabilities are not material, with positive book value of surplus at the end of the test period considered acceptable. Some regulators require that ending value of surplus results be presented on a market value basis.

#### **Q90. How do actuaries define the criteria used to determine reserve adequacy?**

The 2012 survey asked, “What is your current criteria for establishing reserve adequacy?” Of those who responded, 70 percent chose answers suggesting use of a predetermined rule or guideline. Their answers broke down as follows:

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- Thirty-six percent indicated that their criterion was “Enough to pass a specified number of New York 7 scenarios, but not necessarily all of them.”
- Nineteen percent indicated that their criterion was “Enough to pass all of the New York 7 scenarios.”
- Eleven percent answered “Enough to pass a specified percentage of the stochastic scenarios”
- Three percent answered “Enough to pass the level interest scenario.”

The remaining 30 percent gave answers indicating that they were applying some kind of additional judgment. Of the total respondents, 6 percent indicated that they opined based on their own alternate deterministic scenarios. Others gave written answers describing a series of (or combinations of) diverse tests. For example, passing a specified number (but not all) of the New York 7 and a specified percentage of stochastic scenarios was the choice of 8 percent of the respondents.

In interpreting these survey results, it is important to consider the low-interest-rate environment that existed when the survey was taken (fall 2012). One might expect that the responses may have been different if interest rates were closer to historical levels.

#### **Q91. What factors are considered in setting the criteria for reserve adequacy?**

Some actuaries believe that the development of appropriate criteria for reserve adequacy is heavily dependent on the degree of conservatism used to establish the assumptions for each scenario. Some actuaries use a criteria of positive surplus in all scenarios tested for the reserve to be deemed adequate if all of the scenarios in the study represent moderately adverse or more favorable conditions (refer to Q16 for a definition of “moderately adverse conditions”). On the other hand, some actuaries believe that if stochastic approaches were used (generating scenarios that represent the universe of possible outcomes, including extremely adverse conditions “in the tail”), additional reserves would not usually be necessary if a specified small percentage of the scenarios produced negative surplus.

ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*, states that failing any particular scenario does not necessarily require additional reserves. If many scenarios were considered, failure of a small percentage of them would not necessarily indicate that the reserves are deficient. In judging the results of a multi-scenario test, the actuary will typically bear in mind that the surplus generated by any scenario typically is subject to a number of assumptions used in the testing (e.g., investment strategy, interest crediting strategy, and dynamic lapse formula). The liberalism or conservatism of these various assumptions can influence the interpretation of the results.

Additionally, to the extent the actuary considers mandatory scenarios (such as the New York 7), certain of these scenarios may be considered beyond moderately adverse, depending on the current economic environment. ASOP No. 22 gives guidance in this area. Section 3.4.2 states that “the actuary should consider whether reserves ... are

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adequate under moderately adverse conditions.” Actuarial judgment may indicate that certain mandatory scenarios exceed this requirement. In such cases, testing similar, but less severe, scenarios may be appropriate in reaching a determination.

Although the criteria for establishing reserve adequacy are generally better understood now than they were 20 years ago, one article that is still a useful general reference is “Zen and the Art of Reserve and Asset Adequacy,” by D. Becker, M. Smith, and M. Zurcher. This article was first published in Lincoln National’s *Reinsurance Reporter* (3rd quarter, 1993), which is now published by Swiss Re Life & Health America.

For sets of randomly generated scenarios, some actuaries consider what percentage of scenarios failed and by how much. As noted above in Q4, an actuarial test of reserve adequacy is not a solvency test. While a test of solvency generally would involve the passing of a very large percentage of scenarios (and a reasonable limit to the severity of a failure), a reserve typically may be considered adequate as long as a reasonable percentage of scenarios, including a high percentage of moderately adverse scenarios, is passed.

In establishing adequacy criteria, some actuaries consider whether the guidelines apply at the line of business (or product) level or for the entire company. Some actuaries believe that the tolerance for adverse results will be lower at the aggregate than at a line of business level.

Ultimately, the decision to establish additional reserves depends on the actuary’s judgment, regardless of the chosen criteria. The basis of the judgment is typically documented in the supporting memorandum. If additional reserves are recommended and management decides not to strengthen reserves, then the appointed actuary may issue an opinion other than a nonqualified opinion. See Q97 for a discussion of other types of opinions.

To get some indication of the impact of deliberate conservatism in asset adequacy analysis, the following question was included in the 2012 survey: “If you intentionally hold implicit or explicit margins of conservatism, by how much do these impact overall results?” Eighteen percent of respondents estimated the impact of conservatism on results at zero to 5 percent; 31% chose the range 6-10 percent; 9% selected an impact of 11 percent or more. Twenty-one percent answered “Not applicable” and 21% answered “Don’t know.”

### **Q92. How often have actuaries established additional reserves as a result of asset adequacy analysis?**

Approximately 45 percent of those responding to this question in the 2012 survey of appointed actuaries reported that they have increased reserves as a result of asset adequacy analysis at some point in the past.

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Of those who answered yes to this question, 50 percent established additional reserves for year-end 2011.

### **Q93. To what extent do actuaries look at interim results to determine reserve adequacy?**

In the 2012 survey of appointed actuaries, 74 percent of the survey respondents indicated they consider projected results in interim periods as “important” (67 percent) or “critically important” (7 percent). The remaining respondents said that such interim results are either “not very important” (18 percent) or “unimportant” (8 percent).

Consistent with the above responses, 75 percent of all respondents look at the projected results in interim periods and 7 percent look at the year-by-year present value of those interim results. Of all respondents, 58 percent use book value of surplus when examining interim results, while 11 percent use market values and 6 percent use market values of assets less book value of liabilities.

With regard to the scenarios that are considered, 63 percent of the respondents look at all of the New York 7 scenarios, 16 percent look at New York 7 scenario No. 1 only, while the remaining respondents look at (i) subsets of the New York 7 scenarios Nos. 1 to 7, (ii) all deterministic scenarios, or (iii) all deterministic and stochastic scenarios.

Of those who strengthened reserves based on interim results, the method used to release the strengthened reserves generally varied based on the reasons the reserves were strengthened. For example, some reserves are released over the life of the business (e.g., to reflect mortality deterioration or low interest rates) while others are released over a fixed period (e.g., to cover a short-term period of higher asset defaults).

The AOMR (2001 and later) requires the preparation of a regulatory asset adequacy issues summary (RAAIS). The RAAIS requests commentary on any interim results that may be of significant concern to the appointed actuary. Such commentary may generally include, at a minimum, discussion of large negative values, early negative values, and protracted periods of negative value. Refer to Q102 for further discussion of the RAAIS. Some states may impose additional requirements with respect to interim results. As an example, California specifically requires that “[i]f negative interim or ending surplus results are of no significant concern to the Appointed Actuary, explain why”.

### **Q94. If, based on asset adequacy analysis, the reserves are judged to be inadequate, how does the actuary decide upon the amount of additional reserves?**

Approximately one-half of the respondents to this question in the 2012 survey indicated that they never had to set up additional reserves. Of the remainder, 65 percent indicated that they calculate the present value necessary to eliminate the deficiency based on the same criteria they use for establishing reserve adequacy, and 18 percent indicated that, in



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addition to using present values, they also make adjustments to reflect deficiencies in interim results. The remaining 17 percent reported use of a variety of techniques, including conditional tail expectation measures, gross premium reserves, amounts necessary to keep results positive for a predetermined length of time, and professional judgment.

**Q95. When additional reserves are established or released, does the change in reserve go through the gain from operations, or is it booked directly to the surplus of the company?**

Information may be found in the NAIC *Accounting Practices and Procedures Manual*:

Appendix A-822 states:

If the appointed actuary determines as the result of asset adequacy analysis that a reserve should be held in addition to the aggregate reserve held by the company and calculated in accordance with methods set forth in the Standard Valuation Law, the company shall establish the additional reserve. (Section 5E(2))

Additional reserves established ... above and deemed not necessary in subsequent years may be released. ... The release of such reserves would not be deemed an adoption of a lower standard of valuation. (Section 5E(3))

Statement of Statutory Accounting Principles (SSAP) No. 51R—*Life Contracts*, states the following:

The difference between the policy reserve for life contracts at the beginning and end of the reporting period shall be reflected as a change in reserves in the summary of operations, except for any difference due to a change in valuation basis (paragraph 35). A change in valuation basis (except for those required by AG43) shall be defined as a change in the interest rate, mortality assumption, or reserving method (e.g., net level, preliminary term, etc.) or other factors affecting the reserve computation of policies in force and meets the definition of an accounting change as defined in SSAP No. 3—Accounting Changes and Corrections of Errors (paragraph 36).

Based on this, some actuaries believe that the change in reserves resulting from asset adequacy analysis, including any subsequent release of the reserve, would typically be recorded through the gain from operations, rather than directly to surplus.

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### **Q96. What might the appointed actuary do if notified of a material reserve misstatement?**

In the 2013 NAIC's *Annual Statement Instructions* for Life, Accident and Health Insurers (Instruction 12 of the Actuarial Opinion section therein), the following is noted:

The insurer required to furnish an actuarial opinion shall require its appointed actuary to notify its board of directors or its audit committee in writing within five (5) business days after any determination by the appointed actuary that the opinion submitted to the domiciliary Commissioner was in error as a result of reliance on data or other information (other than assumptions) that, as of the balance sheet date, was factually incorrect. The opinion shall be considered to be in error if the opinion would have not been issued or would have been materially altered had the correct data or other information been used. The opinion shall not be considered to be in error if it would have been materially altered or not issued solely because of data or information concerning events subsequent to the balance sheet date or because actual results differ from those projected.

and

No appointed actuary shall be liable in any manner to any person for any statement made in connection with the above paragraphs if such statement is made in a good faith effort to comply with the above paragraphs.

Recent NAIC *Annual Statement Instructions* do not include such language, but such language may inform a path for the appointed actuary to take, including communication with the board of directors and the state of domicile.

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### Section K: Preparing the Opinion and Memorandum

#### Q97. How do actuaries define “qualified opinion”?

The 2001 AOMR does not define what constitutes a “qualified opinion,” so the appointed actuary has been required to make that determination.

VM-30 of the NAIC’s Valuation Manual, which is currently being adopted by states, includes changes to the AOMR. As part of those changes, the terms “adverse opinion,” “qualified opinion,” and “inconclusive opinion” are defined. The appointed actuary will need to identify whether the opinion is unqualified, adverse, qualified, or inconclusive in the table of key indicators. If the opinion is adverse, qualified, or inconclusive, the appointed actuary should explicitly state the reason for such an opinion (Section 3A(10)).

#### Q98. What determines whether a reserve is in the formula reserve, additional reserve, or other amount column of the reserve table that appears in the scope paragraph of the actuarial opinion?

The AOMR includes a reserve table in Section 6B(2) that gives a suggested format for listing reserves that are to be included in the actuarial opinion. Footnotes (a) and (b) of that table describe additional actuarial reserves and analysis methods used, respectively. However, other than the headings on the columns, it does not provide a detailed description of how to prepare the remaining columns. One possible approach to preparing this table follows:

- Column (1) - Formula Reserves: This is for reserves that are subject to asset adequacy analysis. Formula reserves consist of reserves calculated by application of a statutory formula. However, formula reserves also include any reserves that do not have a specified statutory methodology but are calculated by a standard methodology or procedure each year.
- Column (2a) - Additional Actuarial Reserves: Footnote (a) of the reserve table states that the additional actuarial reserves are the reserves established in accordance with the results of the asset adequacy analysis. These additional reserves are addressed under Paragraph (2) of Section 5E of the AOMR.
- Column (2b) - Analysis Method: Footnote (b) of the reserve table states that this is the method used for asset adequacy analysis determined in accordance with the standards for asset adequacy analysis referred to in Section 5D of the AOMR. The appointed actuary may choose to list more than one method for each line in the table (e.g., CFT, GPV), with the corresponding reserve amounts for each method. The appointed actuary may refer to ASOP No. 22 in doing this.

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- Column (3) - Other Amounts: This column is for reserves that were not subject to asset adequacy analysis. A common reason for not analyzing certain business is that the business is not material.
- Column (4) - Total Amount: This is the total of columns (1), (2), and (3). Many actuaries believe that Section 5E(1) of the AOMR requires that these amounts reconcile with the respective reserves of Exhibits 5, 6, and 7 and claim liabilities in Exhibit 8, Part 1, and equivalent items in the separate account statement or statements.

VM-30 of the NAIC's Valuation Manual, which has been adopted by many states, includes changes to the AOMR. One change is to add a column for "Principle-Based Reserves" between Formula Reserves and Additional Actuarial Reserves in the reserve table. It also includes the table as prescribed wording. If changes are made to the scope section, which includes the table, the appointed actuary may indicate that the table does not follow prescribed wording.

To see a discussion of the testing methods and the survey results on the use of these methods by appointed actuaries, refer to Q11.

#### **Q99. What types of actuarial reports do actuaries prepare in connection with asset adequacy analysis?**

All states require the preparation of an actuarial opinion that is filed with the annual statement. The SVL requires that an actuarial memorandum be prepared, which provides details of the analysis to support the actuarial opinion. However, most states do not require that the actuarial memorandum be filed along with the actuarial opinion. A few states require that the actuarial memorandum, or an executive summary of the actuarial memorandum, be filed.

New York Regulation 126 requires that an actuarial memorandum be submitted by all licensed insurers (not only domestic companies). However, if the nondomestic company receives a letter from an accredited state that has reviewed the company's actuarial opinion and memorandum from the prior year and the letter indicates the documentation was found acceptable, the memorandum is only filed if requested by the New York Commissioner.

The 2001 AOMR and VM-30 require that the RAAIS, an executive summary of the memorandum, be submitted by the appointed actuary, typically by March 15 of each year (refer to Q102).

In addition to regulatory reports, many actuaries prepare reports for other audiences such as internal management, external auditors, the board of directors, and rating agencies. Management reports typically include an executive summary of the memorandum rather than the entire memorandum. Some actuaries use the same executive summary for

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management that is used for regulators, while others prepare a modified summary that may contain information not included in the regulatory summary. External auditors typically request copies of both the memorandum and the executive summary for management, along with supporting analysis and documentation. Rating agencies typically request copies of both the actuarial opinion and memorandum.

#### **Q100. What level of detail is typically included in the actuarial memorandum?**

Below is a table giving the responses from the 2012 survey of appointed actuaries for the general type of information respondents include in the memorandum. The percentages represent the percentage of respondents that include the respective item in the memorandum:

Description of scenarios used	99%
Description of sensitivity tests	98%
Description of company and markets in which products are sold	92%
Product description of each product modeled	89%
Products subject to asset adequacy	89%
Breakdown of modeled reserves by line and by type of reserve	88%
Description of reinsurance	87%
Aggregation methods used	83%
Description of reserves not tested	79%
Results by each line of business	79%
Breakdown of modeled assets by line and by asset type	79%
Interim results in the aggregate	72%
Interim results by line of business	56%
Definition of moderately adverse conditions	53%
Factors causing better or worse results in each line of business	48%
Reconciliation between Sept. 30 and Dec. 31	41%

Responses from the survey regarding the level of detail for liability assumptions by line of business:

Detailed listing of key assumptions, high-level description for others	64%
Detailed description and/or listing of assumption factors used	60%
Only high-level description of assumptions	17%

Responses from the survey regarding the level of detail for asset assumptions by portfolio:

Asset segmentation/allocation description	75%
Detailed listing of key assumptions, high-level description for others	56%
Detailed description and/or listing of assumption factors used	43%
Only high-level description of assumptions	23%

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### Q101. What is typically contained in the executive summary for management?

The information included in the executive summary for management differs widely, depending on the types of items that are of interest to company management. Many actuaries include a description of the asset adequacy methods used, a description of the major changes in assumptions and/or methods from the prior year, a description of the criteria used to determine asset adequacy, and a summary of the asset adequacy results. Some executive summaries give a brief history of the objectives of asset adequacy analysis, the areas that contributed to the study, a description of the scenarios used, and results that highlight the particular concerns of management. Other items that are sometimes included are projections of RBC levels at certain future points, interim results during the projection period, and breakdowns of CFT results by major product line. In any event, discussion of the conditions that pose a risk to asset adequacy and how the company could manage under such conditions might be valuable.

### Q102. What is discussed in the regulatory asset adequacy issues summary (RAAIS)?

The 2001 AOMR lists the following items to be included in the RAAIS:

- Descriptions of the scenarios tested (including whether those scenarios are stochastic or deterministic) and the sensitivity testing done relative to those scenarios;
- Whether there are ending surplus results that are negative, and the amount of any additional reserve established to eliminate the negative surplus at the end of the testing period;
- Any material differences in assumptions from the year before;
- The reserves subject to asset adequacy the year before, but not subject in the current opinion;
- Comments on any interim results that may be of significant concern;
- The method used to recognize the impact of reinsurance; and
- Whether the actuary recognized all options embedded in assets.

Some states, including New York and California, require additional disclosures within the RAAIS.

### Q103. What are regulators' suggestions for improvement in actuarial opinions and memoranda?

A group of insurance regulators who are actuaries responded to an open request for comments in 2003 concerning actuarial opinions and memoranda. Some areas they identified for improvement, which should not be interpreted to be an exhaustive list, are:

**Reliance statements:** Adding clarity to identify who developed and took responsibility for certain assumptions. (Sources of information for reliance statements now include ASOP

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No. 23, *Data Quality* and ASOP No. 41, *Actuarial Communications*; the topic is addressed most directly in the 2001 AOMR).

**Assumption detail.** Adding detail and discussion of analysis performed. Paragraph 3.2—Actuarial Report, of ASOP No. 41, *Actuarial Communications*, states the following:

In the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary's work as presented in the actuarial report.

**Reinsurance.** Additional documentation regarding the inclusion / exclusion of reinsurance cash flows, and if included, commentary on model fit.

**Off-balance-sheet items.** Additional documentation regarding the inclusion / exclusion of off-balance-sheet items (such as derivatives) is sought.

**Sensitivity testing.** Expanding sensitivity testing and including in memorandum. One regulator opined that professional practice includes due attention to those risks that the business is most sensitive to, not simply the risks most commonly addressed by a particular analysis method. For example, sensitivity testing of morbidity, lapse rates, or claim termination rates may be considerably more instructive for some lines of business than testing the impact of changes in the interest rate environment. For example, reasonable limits on rate increases in accident and health insurance would typically be applied in order to realistically analyze C-2 risks.

**Investment assumptions.** Providing support for investments assumptions used in model.

**Expense.** More discussion and demonstration were desired to show that expenses used in the model are reasonable and appropriate. There was interest in demonstration that separate account fees cover all expenses allocated to the separate account and cover any general account expense allowances for separate account reserves.

**Clarity.** Some regulators desired a clear discussion of actual or potential problem areas, with adequate attention to interim results and a clear statement to indicate if an opinion is "qualified." Others were concerned that executive summaries were too long and did not always include clear descriptions of potential problems.

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### Section L: Impact of AG43, PBR, and Other Nonformulaic Valuation Standards

#### Q104. What is the “history” of statutory valuation and how is the role of asset adequacy analysis changing?

Elizur Wright established minimum reserve standards for Massachusetts insurance companies in 1858. These reserves were based on a formulaic method with prescribed assumptions such as mortality and valuation interest rate. Later, some companies tested their reserves using a GPV, but, as late as 1985, neither regulators nor the actuarial profession mandated use of CFT. With the introduction of interest-sensitive products having a flexible crediting rate closely related to the rate earned on assets backing the reserves, it became apparent that simplified formula reserves might become inadequate if the company could not earn the guaranteed minimum crediting rate. This situation was exacerbated by the inflationary and unstable interest rate experience in the 1980s, which caused further mismatch between assets and liabilities.

In response to this experience, regulators have gradually introduced more dynamic and flexible valuation requirements. The commissioners’ annuity reserve valuation method (CARVM) was introduced in 1980, requiring multi-scenario analysis of deferred annuities, with the scenarios depending on lapse and mortality experience, rather than interest rate paths. CARVM was further clarified in 1998 with Actuarial Guideline XXXIII (AG33). Dynamic valuation interest rates were introduced in 1982. The Academy drafted “Recommendation #7” requiring CFT, and in 1985, New York incorporated this draft language into Regulation 126; this was the first U.S. regulatory requirement for asset adequacy analysis. Since then, the regulatory requirement for asset adequacy analysis has grown to include almost all products and companies. In the early 1990s, the first version of the AOMR was adopted, bringing a level of standardization to asset adequacy analyses performed throughout the industry.

Flexible mortality assumptions for calculation of deficiency reserves were introduced in 2000 in the Valuation of Life Insurance Policies Model Regulation commonly known as “Regulation XXX.” Its successor, Actuarial Guideline XXXVIII (AG38), followed as new product designs were introduced. The year 2009 saw the introduction of AG43 for variable annuities, requiring a stochastic projection of interest rate and equity return scenarios, along with lapse and mortality assumptions that were fully responsive to varying economic conditions in different scenarios. (The need for AG43 followed more than 10 years of research and committee work by the Academy, which was unable to find an appropriate simplified valuation method for valuing variable annuities with GMIBs.) Around the same time, it became apparent that ordinary life insurance and other products were also moving in the same direction, with multiple options and dynamic crediting rates embedded in these products. Meanwhile, it was apparent that AG38 and Regulation XXX sometimes produced reserves that were well in excess of those reasonably required for regulatory purposes. This led to increased focus on a principle-based reserve (PBR)



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concept for valuation, wherein reserve calculation methods and assumptions are fully dynamic and flexible, following actuarial principles rather than prescribed formulas or assumptions, and result in reserve levels that are already deemed to be adequate based on how they are calculated. Because this theoretical concept had not yet proved its reliability, the emerging standards took on a diverse mixture of old (formulaic, prescriptive) and new (experience-based, company-specific, actuarial professionalism) guidance. Consequently, new reserving methods following a principle-based approach (PBA) have been introduced in recent years, and these continue to evolve (refer to Q105).

### **Q105. Which emerging standards follow the principle-based approach?**

Recently introduced PBA reserve requirements include AG43 for variable annuities and Actuarial Guideline XXXVIII, Section 8D (AG38 8D) for some blocks of universal life policies with secondary guarantees. In addition, some requirements exist for stand-alone asset adequacy reserve analysis, such as for life insurance business subject to AG 38 Section 8C (AG38 8C). Most recently, the revised Valuation Manual (currently adopted by most states) contains Section VM-20—*Requirements for Principle-Based Reserves for Life Products* (VM-20), which addresses life product reserving (even prior to adoption, AG38 8D referred to the VM-20 approach). AG43 is incorporated into the Valuation Manual as VM-21. All of these analyses resemble the asset adequacy analysis required by the AOMR in that they involve projections of asset and liability cash flows. Differences appear, though, in the level of prescription of assumptions and the testing requirements (e.g., scenarios), as well as the scope and issue date range of the business included.

Beyond statutory reserves, there are also capital requirements such as RBC C-3 Phase 1 for fixed annuities and single-premium life insurance and RBC C-3 Phase 2 for variable annuities. These, too, can involve projections of asset and liability cash flows, with differences in the level of prescription of assumptions and the testing requirements (e.g., scenarios), as well as the scope of the business included.

### **Q106. Does meeting the requirements of a PBA reserve simultaneously satisfy the requirements of AOMR?**

All inforce business is subject to AOMR, regardless of the method used to determine the reserve. However, while the AOMR requirements are commonly met via a method such as CFT, other methods are possible (refer to Q11).

Some actuaries believe that a reserve determined via a PBA automatically meets the “moderately adverse conditions” associated with AOMR, and thus include such business in the analysis via the method of Demonstration of Conservatism. Some actuaries will substantiate this through simplified testing or sensitivity analysis. Other actuaries will continue to include PBA-reserved business in CFT or other analysis as part of AOMR.

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In considering whether the PBA reserve meets the AOMR requirements, an actuary may wish to take the following into account:

- An actuary might consider product-specific aspects (optionality, volatility of experience, sensitivity to various assumptions, etc.) as well as distribution of results (where available) under different financial conditions. Indeed, with varying financial conditions, as well as possible differing product characteristics at different policy durations, it is possible that the decision made by the actuary could be different on different valuation dates.
- There is a further complication in that, under the Valuation Manual, only some of a company's reserves are subject to PBA methods, rendering the AOMR aggregate comparisons incomplete.

Given these many facets, it is not surprising that a wide range of practice currently exists:

- From the 2012 appointed actuary survey, 16 percent of responding actuaries defined AG43 as meeting the AOMR requirement, some with additional sensitivity testing, while 23 percent continued to include the business in a CFT or other analysis. It is noted that 61 percent of the survey respondents indicated that AG43 was not applicable to their business (i.e., the business does not have variable annuities in force).
- From the 2012 appointed actuary survey, 33 percent of responding actuaries indicated that they would likely consider PBA (VM-20) requirements for life products as meeting AOMR, while 42 percent indicated that they would likely continue with CFT or some other analysis, at least until more of the inforce business was subject to the PBA. It is noted that 25 percent of the survey respondents indicated that the PBA was not applicable or that they were undecided on their approach.
- From the 2012 appointed actuary survey, 27 percent of responding actuaries indicated that they would likely consider PBA requirements for fixed annuities as meeting AOMR, while 35 percent indicated that they would likely continue with CFT or some other analysis, at least until more of the inforce business was subject to the PBA. It is noted that 38 percent of the survey respondents indicated that the PBA was not applicable or that they were undecided on their approach.

With the advent of PBR and the Valuation Manual for life insurance, optionally effective on Jan. 1, 2017 for new business, it is likely that practice in this area will continue to evolve.

## ASSET ADEQUACY ANALYSIS PRACTICE NOTE

### Q107. How does AOMR interact with AG43 / VM-21?

Like all inforce business, reserves for variable annuities determined under AG43 / VM-21 are subject to AOMR. Given the PBA nature of AG43 / VM-21, some actuaries believe that the reserve determined automatically meets the “moderately adverse conditions” associated with AOMR and thus include it in the analysis via the method of Demonstration of Conservatism. While such a reserve may be considered conservative at a particular valuation date, margins may deteriorate in the future under the same calculation method and assumptions. Thus, some actuaries will perform a simplified analysis (perhaps a single scenario) to satisfy themselves that the AG43 / VM-21 reserve remains adequate.

Alternatively, some actuaries take the approach of continuing to fully incorporate the AG43 / VM-21 business in the AOMR through a method such as CFT. In doing so, any elements of excess conservatism included in the AG43 reserve calculation (for example, a standard scenario amount significantly exceeding the corresponding conditional tail expectation (CTE) amount might be considered excessive conservatism) may become available as additional sufficiency in AOMR (and alternatively, any insufficiency would also be reflected).

From the 2012 appointed actuary survey, 45 percent of the survey respondents reporting AG43 / VM-21 reserves defined AG43 as meeting the AOMR requirement, some with additional sensitivity testing, while 55 percent included the business in a CFT analysis.

Where the results of variable annuity product projections are included in the aggregate company results, it is necessary to first determine the reserve requirement under AG43 / VM-21, as this serves as the initial reserve tested under AOMR.

### Q108. How does AOMR interact with AG38?

There are currently two sections in AG38 that may interact with AOMR: Sections 8C and 8D. Both sections scope in universal life with secondary guarantees issued during certain periods. Section 8C includes all universal life with secondary guarantees issued between Jan. 1, 2007, through Dec. 31, 2012, and Section 8D includes universal life with secondary guarantees with multiple sets of charges issued between July 1, 2005, and Dec. 31, 2012. Section 8C includes a stand-alone asset adequacy analysis that tests the formulaic reserve used for products subject to this requirement. Section 8D is a reserve calculation using a PBA method. There is potential overlap between Sections 8C and 8D, resulting in some policies being subject to both of these requirements, as well as AOMR.

#### AG38 8C:

Like all inforce business, reserves determined under AG38 are subject to AOMR. In completing AOMR, many actuaries make use of various models, each representing different blocks of business, that are then summed to determine the aggregate results for

### ASSET ADEQUACY ANALYSIS PRACTICE NOTE

the company. In such cases, the AG38 8C asset adequacy analysis may represent one of these subset blocks of the company. Alternatively, some actuaries may combine the AG38 8C policies with other policies of the company in completing AOMR. In such cases, the aggregate result may not be equal to what otherwise would have been the “sum of the parts.” Alternatively, an actuary could choose to consider the AG38 8C business as “tested”: in such case, any sufficiency found within the AG38 8C block would effectively not be included in the aggregate company results. (Note: If the AG38 8C result is a potential insufficiency, an additional reserve may be established to achieve adequacy. Such additional reserve would become part of the initial reserve tested for the AG38 8C business under AOMR. Hence, it would not be expected that there could be a situation where an “insufficiency” could be ignored when choosing not to include the AG38 8C results in the aggregate AOMR.)

#### **AG38 8D:**

Like all inforce business, reserves determined under AG38 are subject to AOMR. Given the PBA nature of AG38 8D, some actuaries believe that the reserve determined meets the “moderately adverse conditions” associated with AOMR and thus these actuaries include the reserve in the analysis via the method of Demonstration of Conservatism. While such a reserve may be considered conservative at a particular valuation date, there may be changes in conditions or other factors that affect the margins. Thus, some actuaries will perform a simplified analysis (perhaps a single scenario) to satisfy themselves that the AG38 8D reserve remains adequate under the requirements of asset adequacy analysis.

Alternatively, some actuaries take the approach of continuing to fully include the AG38 8D business in AOMR through a method such as CFT. In doing so, elements of conservatism included in the AG38 8D reserve calculation may become available as additional sufficiency in AOMR.

Where the results of the AG38 8D products are included in the aggregate company results, it is necessary to first determine the reserve requirement under AG38 8D, as this serves as the initial reserve tested under AOMR.

#### **Q109. How does AG38 8C interact with AG38 8D, and in turn with AOMR?**

There are three combinations of the AG38 8C and AG38 8D policies to consider:

- a) Policies that are subject to AG38 8C, but not to AG38 8D:

Most actuaries would calculate the AG38 8C formulaic reserve and use this as the initial reserve in the stand-alone asset adequacy analysis. If an additional stand-alone asset adequacy analysis is indicated, this reserve would become part of the initial reserve for AOMR. Some actuaries would then perform AOMR, possibly with this block as a subset of the total, or possibly combined with other business. Alternatively, some actuaries would consider AOMR to have already been met.

## ASSET ADEQUACY ANALYSIS PRACTICE NOTE

b) Policies that are subject to AG38 8D, but not to AG38 8C:

Most actuaries would first calculate the AG38 8D reserve. Some actuaries would then consider this reserve to meet the requirements of AOMR via the method of Demonstration of Conservatism, possibly confirming this through a simplified analysis or other approach. Alternatively, some actuaries would include the AG38 8D business in the AOMR models, with its contribution to the sufficiency (or insufficiency) reflected in the company's aggregate result.

c) Policies that are subject to both AG38 8C and AG38 8D:

Most actuaries would first calculate both the AG38 8C formulaic reserves and the AG38 8D reserves, and determine the higher to be the appropriate initial reserve for the policy. If the AG38 8D reserve is higher, some actuaries would consider this reserve to automatically meet the "moderately adverse conditions" associated with AOMR. Alternatively, some actuaries would complete a stand-alone asset adequacy analysis to determine whether any additional reserve were required. If an additional stand-alone asset adequacy analysis is indicated, this reserve would become part of the initial reserve for AOMR. Some actuaries would then perform AOMR, possibly with this block as a subset of the total, or possibly combined with other business. Alternatively, some actuaries would consider AOMR to have already been met.

It is noted that some of the aforementioned blocks may be combined, for example, AG38 8D that is also AG38 8C, with AG38 8C that is not also AG38 8D, in performing the AG38 8C asset adequacy analysis. Such approaches may vary given practical modeling and materiality considerations.

### **Q110. If an actuary establishes an additional reserve, is this additional reserve included in subsequent analyses?**

Asset adequacy analysis is a test of the "initial reserve" for inforce policies as reported in the current statement. Thus, if an "additional reserve" is part of the initial reserve, it is generally included in the analysis.

For example, AG38 8C may result in an additional asset adequacy analysis reserve established. This becomes part of the reported reserve of the AG38 8C business. When the AG38 8C block is then tested under AOMR, the entire initial (reported) reserve is included (i.e., tested) in AOMR.

## ASSET ADEQUACY ANALYSIS PRACTICE NOTE

### **Q111. What differences exist between completing the asset adequacy analysis required under AOMR versus that required under AG38 8C?**

Asset adequacy analysis methods described earlier in this practice note apply under both aggregate analysis (AOMR) and stand-alone analysis (AG38 8C). Thus, methods and approaches will be similar. Scope (business included) obviously differs. Assumptions and scenarios considered would generally not differ. However, some actuaries may include larger margins in stand-alone analyses given that natural offsets with other blocks of business are unavailable. Similarly, for stand-alone analysis, it may be that some scenarios otherwise considered for the total company are not applicable. Documented substantiation of differences applied to the policies that fall under these two requirements may be valuable.

### **Q112. What differences exist in establishment of additional reserves under AOMR versus AG38 8C stand-alone asset adequacy analysis?**

Many actuaries would use the same models, assumptions, scenarios, etc., in completing both of these requirements for the same block of business. As such, results of the analyses would be expected to be the same. However, some difference could exist if the AG38 8C business is combined with other business of the company in completing AOMR. Regardless, the actuary will establish any additional reserve based on the results. Consistency in analytic approach (refer to Q11) is generally desired. However, some actuaries believe that a more stringent standard should be applied when reviewing stand-alone testing results that do not have the opportunity for offset in the aggregate with other business of the company.

### **Q113. What differences exist in the reporting requirement of AOMR versus other regulatory analyses?**

The specific reporting requirements for AOMR, AG38 8C, AG38 8D, AG43, VM-20, etc., are found in the respective model regulation or guidelines. Many analyses require that a “stand-alone report” be prepared. As there can be substantial repetition of information among related reports, some actuaries will create a “base” report and then reference it in other reports where necessary. Some actuaries will create common report “chapters” or “appendices” that can be combined in different ways to meet the multiple reporting requirements. Some actuaries will create a single “giant report” that includes all requirements. Other actuaries will create separate, distinct reports, potentially with significant repetition of data. Often the exact structure of the reports will vary depending on the relative importance of each block of business (materiality), the degree of complexity of the analysis, and/or in response to preferences expressed by the company’s domestic regulator or other recipient of the report. See also Q99 and Q100.

ASSET ADEQUACY ANALYSIS PRACTICE NOTE

**Appendix A: Acronym Definitions**

ABS	Asset-Backed Security
Academy	American Academy of Actuaries
ACG	Actuarial Compliance Guideline
ACLI	American Council of Life Insurers
AG38 8C	Actuarial Guideline XXXVIII, Section 8C
AG38 8D	Actuarial Guideline XXXVIII, Section 8D
AG43	Actuarial Guideline XLIII for Variable Annuities
AOMR	Actuarial Opinion and Memorandum Regulation
ASOP	Actuarial Standard of Practice
AVR	Asset Valuation Reserve
CFT	Cash Flow Testing
CMO	Collateralized Mortgage Obligation
DAC	Deferred Acquisition Cost
DTA	Deferred Tax Asset
DTL	Deferred Tax Liability
FHLMC	Federal Home Loan Mortgage Corporation
FNMA	Federal National Mortgage Association
GMIB	Guaranteed Minimum Income Benefit
GNMA	Government National Mortgage Association
GPV	Gross Premium Valuation
IMR	Interest Maintenance Reserve
Libor	London Interbank Offered Rate
MBS	Mortgage-Backed Security
MVL	Market Value of Liabilities
NAIC	National Association of Insurance Commissioners
PAC	Planned Amortization Class
PBA	Principle-Based Approach
PBR	Principle-Based Reserve
PSA	Public Securities Association Standard Prepayment
RAAIS	Regulatory Asset Adequacy Issues Summary
RBC	Risk-Based Capital
Regulation XXX	Valuation of Life Insurance Policies Model Regulation
SOA	Society of Actuaries
SSAP	Statement of Statutory Accounting Principles
SVL	Standard Valuation Law
VM-20	Valuation Manual-20
VM-30	Valuation Manual-30
VM-G	Valuation Manual-Appendix G



## MEMORANDUM

TO: Life Actuarial (A) Task Force

FROM: Pat Allison, NAIC Staff

DATE: November 17, 2022

RE: Recommended replacement related to APF 2022-04 Swap Spreads and LIBOR transition to SOFR

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### Background

The purpose of this memo is to recommend: 1) LATF adoption of Secured Overnight Financing Rate (SOFR) swap spreads as the replacement for LIBOR swap spreads effective 12/30/22, which is the last business day coincident with or preceding 12/31/22 (which is a Saturday) so that prescribed spreads as of 12/31/22 (which equal those on 12/30/22) are based on the approach specified in this memo; 2) The approach to be used in calculating current and long-term swap spread curves as of 12/30/22; and 3) Technical implementation details as recommended by the American Academy of Actuaries. These recommendations are consistent with APF 2022-04 (which is effective for the 2023 *Valuation Manual*), which identifies the SOFR as the replacement for LIBOR, and the VM-20 Section 9.F.8.d Procedure for Setting Prescribed Gross Asset Spreads, cited below:

A current and long-term swap spread curve shall be prescribed for year one and years four and after, respectively, with yearly grading in between. The three-month and six-month points on the swap spread curves shall be the market-observable values for these tenors. Currently, this shall be the corresponding London Interbank Offered Rate (LIBOR) spreads over Treasuries. When the NAIC determines LIBOR is no longer effective, the NAIC shall recommend a replacement to the Life Actuarial (A) Task Force which shall be effective upon adoption by the Task Force.

The last sentence above notes that the NAIC shall recommend “a replacement”, which indicates an intent to replace the prescribed current and long-term swap spread curves with a single replacement, as opposed to continuing the NAIC’s prescription of LIBOR beyond the adoption date.

### Determination that LIBOR is no longer effective

The Alternative Reference Rates Committee’s November 9 Meeting Readout highlighted continued progress in the transition from LIBOR to SOFR, with SOFR predominant across derivatives markets. Specifically, SOFR swaps have accounted for more than 90 percent of daily volumes on average of

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interest rate risk traded in the outright linear swaps market for the last two months while LIBOR swaps accounted for less than 4 percent of the overall volume in October. Based on this information, NAIC staff has determined that LIBOR is no longer effective.

Actuarial judgment may be required in the use of prescribed swap spreads (for example, in the case where companies have a combination of SOFR and LIBOR-based swaps). VM-20 Section 9.F.8.d states, in part “Interest rate swap spreads over Treasuries shall be prescribed by the NAIC for use throughout the cash-flow model *wherever appropriate* for transactions and operations...” (emphasis added).

### **Recommended Replacement for Current Benchmark Swap Spreads**

Effective December 30, 2022, NAIC staff recommends that for each month-end date, LIBOR swap spreads shall be replaced with SOFR swap spreads<sup>1</sup>:

- 3-month LIBOR spread should be replaced with 3m SOFR swap<sup>2</sup> spread
- 6-month LIBOR spread should be replaced with 6m SOFR swap spread
- 1-year swap spread should be replaced with 1yr SOFR swap spread
- ...
- 30-year swap spread should be replaced with 30yr SOFR swap spread

### **Recommended Replacement for Long-Term Benchmark Swap Spreads**

Effective December 30, 2022, NAIC staff recommends the following approach for the calculation of long-term benchmark swap spreads, consistent with APF 2022-04:

1. Extract daily swap spread data over the prescribed observation period (rolling 15-year period) ending on the last business day of the quarter from at least two reputable data sources. If the data source provides swap rates rather than swap spreads, convert the daily swap rate for each maturity to a swap spread by subtracting the corresponding maturity Treasury yield from the swap rate.
2. Calculate SOFR swap spreads as follows for the last business day “u” of 2022, where “u” is the 12/30/22 effective date of the adoption by the Life Actuarial (A) Task Force of SOFR swap spreads as the replacement for swap spreads previously prescribed:
  - a. For each maturity “m” = 0.25, 0.5, 1 ... 30 years, and business day “u”:  
$$\text{SOFR swap spread}(m,u) = \text{SOFR swap rate}(m,u) - \text{Treasury yield}(m,u).$$
3. Calculate SOFR swap spreads as follows for each business day before the 12/30/22 effective date of the adoption by the Life Actuarial (A) Task Force of SOFR swap spreads as the replacement for swap spreads previously prescribed, utilizing Bloomberg’s 2021-03-05 published USD Spread Adjustments:
  - a. For each maturity “m” = 3 or 6 months, and business day “u”,
    - i. 
$$\text{SOFR swap spread}(3 \text{ months},u) = \text{LIBOR swap spread}(3 \text{ months},u) - 0.26161\% \text{ (the USD 3-month Spread Adjustment)}$$

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<sup>1</sup> During 2021 the swap market evolved such that the definition of a standard n-year interest rate swap changed in January 2022 to be a SOFR swap from the LIBOR swap.

<sup>2</sup> 3-month and 6-month SOFR swap rates are defined herein as the fixed rate one party pays at the end of three months or six months in exchange for receiving at such time 3-month SOFR or 6-month SOFR, calculated on a compounded in arrears basis.

- ii.  $\text{SOFR swap spread}(6 \text{ months}, u) = \text{LIBOR swap spread}(6 \text{ months}, u) - 0.42826\%$  (the USD 6-month Spread Adjustment)
  - b. For each maturity “m” = 1 ... 30 years, and business day “u”:  
 $\text{SOFR swap spread}(m, u) = \text{LIBOR swap spread}(m, u) - 0.26161\%$  (the USD 3-month Spread Adjustment)
4. Average the swap spread data from the data sources by maturity over the prescribed observation (rolling 15-year period).
5. Calculate the Long-Term Benchmark Swap Spreads as the 85% conditional mean for each of the 32 maturity categories (three-month, six-month, one-year, two-year, ... 30-year) using the same business trading days as were used in the 85% conditional mean for long-term bonds spreads.
6. Publish the Long-Term Benchmark Swap Spreads in a table. Among tables published on the NAIC website (See Subsection H), Table J shows Long-Term Benchmark Swap Spreads

In Table J, NAIC staff shall clarify that from 12/31/22 forward, prescribed current and long-term benchmark swap spreads are SOFR swap spreads. [Drafting Note: The tables will be labeled to indicate they contain SOFR swap spreads.

#### **Technical Implementation Details**

NAIC staff recommends that implementation of prescribed current and long-term benchmark SOFR swap spreads be based on guidance included in a November 17, 2022 comment letter to LATF from the American Academy of Actuaries. The Academy letter provides technical details on the calculation of treasury par yield curve rates, as well as prescribed swap spread calculations and their publication. The letter outlines three alternative approaches to handle inconsistencies in the historical swap spreads. NAIC staff recommends alternative #2, which is recommended by the Academy in such comment letter. This would mean that for purposes of calculating long-term swap spreads, historical current swap spreads would be recalculated for December 31, 2021 through December 29, 2022, but only to remedy the inconsistency where spreads were a 50/50 blend of LIBOR swap spreads and SOFR swap spreads.



November 17, 2022

Ms. Rachel Hemphill  
Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners (NAIC)

Re: Academy input on implementation on Treasury par yield curve rates and on prescribed swap spread calculations and their publication, for APF 2022-04 on swap spreads and London Inter-Bank Offered Rate (LIBOR) transition to Secured Overnight Financing Rate (SOFR) (the “APF”), and for the anticipated next version of a related memo (the “Memo”) from NAIC staff

Dear Ms. Hemphill,

The Life Reserves Work Group, Annuity Reserves and Capital Work Group, and Variable Annuity Reserves and Capital Work Group of the American Academy of Actuaries<sup>1</sup> (the “Academy”) appreciates the opportunity to provide guidance on this topic. The Academy is thankful to LATF and NAIC staff as well for the July 30 LATF adoption of the APF, the June 9 and May 26 exposures of earlier versions of the APF and of the Memo, as well as for additional communications throughout the calendar year.

The Academy has received an informal request from NAIC staff for input with regard to implementation of the APF and the Memo. More specifically, NAIC staff would like Academy input on what data source(s) and or methodology might be used, among numerous possibilities, to calculate Treasury rates that would be subtracted from SOFR swap rates (that the NAIC will obtain from other sources) on each business day to calculate prescribed swap spreads for SOFR swaps for the 32 maturities (3-month, 6-month, 1-year, 2-year, . . . , 29-year, 30-year) in VM-20. Given that this topic is quite technical, this letter also includes Academy input, which covers additional implementation details for the APF and the Memo beyond what is specified in the APF, on prescribed swap spread calculations and their publication by the NAIC.

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

### **Academy input on Treasury yields to implement the APF:**

After reviewing several possibilities and receiving some preliminary input from NAIC staff, the Academy recommends the following approach:

1. Obtain Treasury par yield curve rates for 10 on-the-run (OTR) maturities (3m, 6m, 1y, 2y, 3y, 5y, 7y, 10y, 20y, 30y) from either:
  - a. [https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily\\_treasury\\_yield\\_curve&field\\_tdr\\_date\\_value=2022](https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_yield_curve&field_tdr_date_value=2022) ;  
or
  - b. <https://www.federalreserve.gov/releases/h15/> ; (note on this page the Treasury par yield curve rates are labeled as “Treasury constant maturities”)
  
2. Utilize the “monotone convex spline” (MC) method to calculate par yield curve rates for the 32 swap spread maturities prescribed in VM-20, as such method has been adopted by the U.S. Treasury starting December 6, 2021, either A) by using a spreadsheet (e.g., a historical saved version is available by copy/pasting the following into an internet browser:  
<http://web.archive.org/web/20180903055110/finmod.co.za/Monotone%20Convex%20Interpolation.xls>) created by Graeme West, who co-authored a paper titled “Methods for Constructing a Yield Curve” (as discussed below) or B) by using any mathematically equivalent approach:
  - a. Enter as percentages the par yield curve rates, for the 10 OTR maturities, into cells D1 to D10 of the “input” tab in the spreadsheet;
  - b. Click on the “Boot curve” button in the “input” tab in the spreadsheet; and
  - c. Extract from column B of the “curves” tab in the spreadsheet the Treasury par yield curve rates for the 32 maturities prescribed in VM-20 (which could be listed at the bottom of this tab via an Excel VLOOKUP formula or macro created by NAIC staff or the Academy).

### **Academy input on prescribed Current swap spread calculations and their publication:**

3. Convert SOFR swap rates obtained from each data source to a bond-equivalent semi-annual Actual/Actual basis as needed. To perform these calculations, please note the following market conventions that are used in the trading of such derivative instruments:
  - a. 3-month and 6-month SOFR swap rates are quoted by the Chicago Mercantile Exchange on a 3-month Actual/360 and a 6-month Actual/360 basis, respectively.
  - b. 1-year, 2-year, 3-year ... 29-year, 30-year SOFR swap rates are quoted on an annual Actual/360 basis.

4. Convert any LIBOR swap rates obtained from each data source to a bond-equivalent semi-annual Actual/Actual basis as needed. To perform these calculations, please note the following market conventions that are used in the trading of such derivative instruments:
  - a. 3-month and 6-month LIBOR are quoted on a quarterly Actual/360 and a semi-annual Actual/360 basis, respectively.
  - b. 1-year, 2-year, 3-year ... 29-year, 30-year LIBOR swap rates are quoted on a semi-annual 30/360 basis.
  
5. Calculate prescribed Current swap spreads for each of the 32 swap spread maturities prescribed in VM-20 on a bond-equivalent semi-annual Actual/Actual basis, after first calculating SOFR swap spreads from each data source as the SOFR swap rates from such data source, converted to a bond-equivalent semi-annual Actual/Actual basis as needed, minus the par Treasury yield curve rate of the same maturity (note this formula is consistent with the APF). If the NAIC also publishes LIBOR swap rates for as long as it has sufficient data from data sources to do so, these should be calculated on a bond-equivalent semi-annual Actual/Actual basis, after first calculating LIBOR swap spreads from each data source as the LIBOR swap rates from such data source, converted to a bond-equivalent semi-annual Actual/Actual basis as needed, minus the par Treasury yield curve rate of the same maturity.
  
6. Specify the following, in the NAIC spreadsheets where prescribed swap spreads are published, that starting with the effective date (that the Academy expects will be December 30, 2022, which is the last business day in 2022) specified in the Memo:
  - a. These 32 Current swap spreads prescribed in VM-20 are expressed on a bond-equivalent semi-annual Actual/Actual basis.
  - b. For each of the 32 swap spread maturities, the prescribed Current swap spread is calculated as the difference of:
    - i. the average SOFR swap rate obtained by the NAIC from data providers for such maturity, after each rate obtained is converted to a bond equivalent (semi-annual Actual/Actual) basis as needed, minus
    - ii. the Treasury par yield curve rate for such maturity, where such Treasury par yield curve rate is determined using the process described in the “Academy recommendation on Treasury yields” section of this letter.
  - c. If the NAIC also publishes LIBOR swap rates for as long as it has sufficient data from data sources to do so, then for each of the 32 Current swap spread maturities, the LIBOR swap spread is calculated as the difference of:
    - i. the average LIBOR swap rate obtained by the NAIC from data providers for such maturity, after each rate obtained is converted to a bond equivalent (semi-annual Actual/Actual) basis as needed, minus

- ii. the Treasury par yield curve rate for such maturity, where such Treasury par yield curve rate is determined using the process described in the “Academy recommendation on Treasury yields” section of this letter.
    - d. The purpose of specifying the above information is for a company that has one or more models that (i) require the input of swap spreads over Treasury rates that are expressed on a different payment frequency and/or day count basis (e.g., the market convention for each maturity), and/or (ii) calculate Treasury rates and/or swap rates, based on input for Treasury rates and prescribed swap spreads for some or all of the 32 prescribed swap spreads, in a different manner than described above (e.g., a different interpolation method, and/or a different method for calculating OTR constant maturity Treasury yield curve rates that might be implemented by an economic scenario generator that the company uses), so that the company can transform the prescribed swap spreads to be precisely equivalent for use in the company’s models. Given that the NAIC is still working on technical details for the interest rate model in the GEMS ESG, which potentially could result in (i) and/or (ii) above, the Academy offers the opportunity to address this topic at the appropriate time with the NAIC ESG Technical Drafting Group.
7. Also, we recommend stating the following in the NAIC spreadsheets where prescribed swap spreads are published: “Prior to the effective date specified in the Memo, prescribed Current spreads were calculated using a less precise methodology than that being used starting on that effective date, such that the older prescribed Current spreads could not be described as:
- a. being spreads over a Treasury curve calculated on a specific basis that could be replicated by third parties, or
  - b. as having for all 32 maturities a specific payment frequency or day count basis.”

Before NAIC implementation, if such is request, the Academy would be pleased to peer review any NAIC preliminary calculations and/or provide the NAIC with formulas to implement the above recommendations.

#### **Academy input for prescribed Long term swap spread calculations**

The Academy has discussed the extent to which the Academy should recommend that starting on the effective date specified in the Memo, prescribed Long term swap spread calculations should involve NAIC recalculation of historical prescribed Current swap spreads to remedy inconsistencies discussed above. Below is a discussion of three alternatives for Long term swap spread calculations starting with the effective; the Academy views #2 as the most practical, as explained below.

- 1) Do not recalculate any historical Current swap spreads;

- 2) Recalculate historical Current swap spreads for December 31, 2021, through the business day preceding the effective date, but only to remedy that inconsistency where such spreads were a 50/50 blend of LIBOR swap spreads and SOFR swap spreads; or
- 3) Recalculate all historical swap spreads for the experience period (not longer than 15 years) to be used to calculate Long term swap spreads on the effective date, reflecting all of the modifications mentioned in this letter.

The Academy recommends that:

- Item #1 not be used because:
  - For 15 years starting with the effective date, about 1/15<sup>th</sup> of the prescribed Long term spread calculations (e.g., from 12/31/2021 to 12/30/2022) would involve use of Current swap spreads that deviated from VM-20.
- Item #2 is the most practical approach because:
  - It involves only a limited amount of extra work (e.g., following VM-20 to recalculate Current swap spreads from 12/31/2021 to 12/30/2022);
  - It does not involve the historical recalculation of Current swap spreads to reflect the above Academy input, starting with the effective date, on Treasury yields and Current swap spreads, and is this much easier for NAIC staff to implement than #3; and
  - Because, although #2 involves recalculation of about 1/15<sup>th</sup> of the historical prescribed Current swap spreads used in Long term swap spread calculations starting with the effective date, it is expected to result in a smoother transition than #3 (which involves recalculation of all of the historical prescribed Current swap spreads) in prescribed Long term swap spreads from the three month-end dates preceding the effective date.
- Item #3 not be used, even though it would be the most theoretically sound calculation prospectively, because
  - It involves more work for NAIC staff than #2; and
  - It is expected to result in a less smooth transition than #2 in prescribed Long term swap spreads from the three month-end dates preceding the effective date, which might cause an AAT, PBR or principles-based capital under RBC to result on the effective date for a company that is materially different from the qualified actuary's expectations.

**Academy input on NAIC governance for prescribed swap spread calculations**

Given that the calculations above involve several steps and multiple sources, and the possibility that human error could occur at a data provider or at the NAIC, the Academy recommends that the NAIC implement a quality control process to be used to ensure that prescribed spreads that are calculated and published, starting with the effective date specified in the Memo (e.g., December 30, 2022) are consistent with the APF, the Memo, and this Academy letter. The Academy would be pleased to provide private comments directly to NAIC staff on their proposed quality control process.

**Academy input on the Memo**

Please recall that on June 10, LATF exposed a June 9 draft of the Memo, which upon LATF adoption would implement the last sentence in Section 7.F.8.d, which reads: “When the NAIC determines LIBOR is no longer effective, the NAIC shall recommend a replacement to the Life Actuarial (A) Task Force which shall be effective upon adoption by the Task Force.” In coordination with NAIC staff, the Academy recommends that NAIC staff refine its earlier draft of the Memo to recommend LATF implementation of the Memo that is consistent with the above input in this Academy letter, ideally with an effective date of December 30, 2022, which is the last business day coincident with or preceding December 31, 2022 (which is a Saturday), so that prescribed spreads as of December 31, 2022 (which equal those on December 30, 2022) are based on the approach specified in the Memo and thus would be reflected in 2022 year-end reporting. In order to achieve such consistency, the Academy recommends that LATF expose for comment the next version of the Memo.

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The Academy appreciates the efforts of LATF and NAIC staff on the APF and Memo. If you have any questions or would like further dialogue on the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Alan Routhenstein, MAAA, FSA  
Member, Life Valuation Committee  
American Academy of Actuaries



**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity Interim Values should be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). A state may want to consider whether an MVA is appropriate. In making a determination regarding whether an MVA should be applied and, if applicable, what an acceptable MVA formula is, the state should consider whether the Interim Values provide reasonable equity between the contract holder and the insurance company.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities,

risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated; and
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated.
  
2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.

3. Descriptions of

- a. The value of the Fixed Income Asset Proxy;
- b. The market value adjustment formula, if any;
- c. The market value of the Derivative Asset Proxy including any Trading Costs; and
- d. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

**Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.

Draft: 11/28/22

Life Actuarial (A) Task Force  
Virtual Meeting  
November 10, 2022

The Life Actuarial (A) Task Force met Nov. 10, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil and Elaine Lam (CA); Michael Conway represented by Eric Unger (CO); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Michael Muldoon (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Adopted its Summer National Meeting Minutes

Chupp noted a minor correction to the Task Force’s Summer National Meeting minutes on page 2, stating that the reference to “American Comment Letter” for Attachment 9 should be “Academy Comment Letter.”

Weber made a motion, seconded by Chupp, to adopt the Task Force’s Aug. 8 minutes with the correction suggested by Chupp (*See preceding 2022 Summer National Meeting Minutes Packet*). The motion passed unanimously.

2. Discussed Comments Received on the Oct. 13 ILVA Exposure

Weber noted that the Task Force had received comments on the Oct. 13 exposure of the Actuarial Guideline Index-Linked Variable Annuities Draft (AG ILVA Draft) (Attachment Two-A) and the associated exposure questions (Attachment Two-B) and that the Task Force would discuss those comments today.

Brian Bayerle (American Council of Life Insurers—ACLI) said, regarding the ACLI’s comments (Attachments Two-C and Two-D) on the first exposure question on the term of the market value adjustment (MVA), that the AG ILVA Draft should allow companies to use a term length other than the maturity of the fixed income asset proxy. He said that this would allow policyholders to connect any MVA to their term length selection and facilitate company asset-liability management. He said that investment strategies for these products could change over time, particularly for flexible premium products. Beth Keith (American Academy of Actuaries—Academy) noted that the Academy agrees with the ACLI position in its comments (Attachments Two-E and Two-F) that companies should be able to have flexibility on the length of the MVA.

Leung noted that he thinks the company should be given more flexibility to set the length of the MVA after the maturity of the initial index strategy. Yanacheak noted that the language in the AG ILVA Draft requiring the MVA term length to be equal to the maturity of the fixed-income asset proxy may eliminate certain products that are currently marketed. Hemphill agreed that different term lengths could be appropriate and did not necessarily conflict with the principles of the AG ILVA Draft. Tsang asked the ACLI whether the concern of the industry was that the maturity of the fixed-income asset proxy did not line up with how companies are investing to support the indexed-linked variable annuity (ILVA) products. Jonathan Clymer (ACLI) noted that some of these products can have flexible premiums, which can make the company’s asset-liability management strategy more complex.

Yolanda Chow (ACLI) then walked through an example (Attachment Two-G) of a flexible premium ILVA product, noting the challenges of setting the MVA term equal to the maturity of the fixed income asset proxy for these products. Tsang noted that he understands the concerns that had been raised with the MVA term length and stated that a possible solution would be to allow the length of the MVA term to vary with the maturity of the underlying assets.

Bayerle then began the discussion of the ACLI's comments on the second question of whether companies should be allowed to include or exclude an MVA in their products, noting that the ACLI believes that companies should be allowed the flexibility to include or exclude an MVA. Bayerle stated that while the ACLI agrees that the contract value should be materially consistent with the market value of the equity exposure, interest rate exposure may not be a primary motivator for policyholders to purchase the product. Thus, an MVA may not be appropriate for some products. Several state insurance regulators then voiced their opinion, with some noting support for allowing flexibility in including or excluding an MVA and others stating that an MVA should always be included. As the meeting time ran out before a resolution could be reached, it was determined that the Task Force's scheduled meeting the following week would be extended to continue the ILVA discussions.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/11 10/Nov 10 Minutes.docx

**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply



with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the maturity of the fixed income assets supporting the ILVA, and with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.

The market value of the Fixed Income Asset Proxy is its book value, using the yield above, adjusted using a market value adjustment formula (MVA) appropriate for the maturity of the Fixed Income Asset Proxy.

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a Derivative Asset Proxy. In determining the market value of the Fixed Income Asset Proxy an

MVA is applied to the book value of the fixed assets to approximate the market value of the fixed income assets supporting the ILVAs. No additional MVA is applicable to Strategy Values or Interim Values.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and
  - e. The market value adjustment applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value

of the fixed income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance company.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. The market value of the Fixed Income Asset Proxy including the market value adjustment formula;
  - b. The market value of the Derivative Asset Proxy including any Trading Costs; and
  - c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

### **Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.

**In addition to general feedback on the draft Actuarial Guideline ILVA, the Life Actuarial (A) Task Force would like commenters to consider the following questions:**

**AG ILVA Exposure Questions**

- 1. In addition to the Market Value Adjustment (MVA) approach outlined in the draft AG, should the AG allow companies to utilize MVA term lengths other than the maturity of the Fixed Income Asset Proxy? For example, Index Strategy Term or surrender charge period, etc.*
- 2. Should the AG allow companies to continue to have the option to include or exclude a MVA in their ILVA products?*



November 2, 2022

Rachel Hemphill, Chair  
Craig Chupp, Vice Chair  
Life Actuarial (A) Task Force  
National Association of Insurance Commissioners

**RE: LATF Exposure of Actuarial Guideline ILVA: Nonforfeiture Requirements for  
Index Linked Variable Annuity Products**

Dear Madam Chair and Mr. Vice Chair:

The American Council of Life Insurers (ACLI)<sup>1</sup> and the Committee of Annuity Insurers (CAI)<sup>2</sup> appreciate the opportunity to submit the following comments to LATF on their exposure of *Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products*. We would also like to thank the ILVA Subgroup for addressing many of our previous concerns.

**Introduction: ILVAs and the ILVA Marketplace**

As you know, the ILVA market has seen substantial growth over the past several years. ILVAs fill an important midpoint on the risk/reward spectrum – between conventional fixed indexed annuities and conventional unit-linked variable annuities – that is consistent with the investment objectives and risk tolerances of many retirement savers. The growth of this market has been fostered by the diversity of ILVA product designs that offer consumers a wide variety of linked indexes/benchmarks, different index crediting terms, and perhaps most importantly a wide variety of crediting strategies that incorporate different crediting and protection features. This diversity has also been aided by the increasing number of carriers offering these products, and the fact that ILVAs are being distributed and offered through a variety of different distribution channels that have afforded meaningful ILVA choices to consumers.

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<sup>1</sup> The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

<sup>2</sup> The Committee of Annuity Insurers is a coalition of life insurance companies that issue annuities. It was formed in 1981 to address legislative and regulatory issues relevant to the annuity industry and to participate in the development of public policy with respect to securities, state regulatory and tax issues affecting annuities. The CAI's current 30 member companies represent approximately 80% of the annuity business in the United States.

Insurers manufacture ILVA products by investing in fixed income assets with a return that covers the cost of the indexed liability benefits, expenses, and profit/risk margins. This chassis is also similar to other products treated as variable annuities that are exempt from the NAIC's Standard Nonforfeiture Law for Individual Deferred Annuities (Model 805), such as modified guaranteed (MGA or MVA) annuities.

### **Substantive Comments**

We appreciate that LATF does not want to see undue disruption to the ILVA market, particularly since this market is clearly meeting an investor need that was not previously being met with other annuity or investment products. We share that goal. Consequently, the ACLI and CAI have worked diligently throughout the Subgroup's process of developing the ILVA AG to provide input intended to ensure that the AG is principles-based, recognizes the diversity of ILVA designs in the marketplace and would accommodate ongoing innovation. Our remaining comments on the exposure draft of the ILVA AG are offered in that spirit.

Our members continue to have certain concerns around the Mark to Market Adjustment also referred to as the Market Value Adjustment (MVA) in the guideline. The concerns are related to adhering to the Actuarial Guideline (AG) principles of equity and consistency between asset and interim values, consumer choice and understanding, product diversity, practical product design considerations for companies and consumers, and the management of the risks related to the fixed income portion of the ILVA structure. While the AG may address certain regulatory concerns, we feel that there are practical considerations that need to be addressed in the guideline in order to allow insurers to continue to offer certain product features that are consistent with the AG principles and are valued by consumers.

With our consumers in mind, we respectfully request that the guideline maintain the level of MVA flexibility offered in previous exposure drafts. Multiple methods exist to satisfy the principles of the AG with respect to reflecting the fixed income asset performance in the interim values and the AG should allow flexibility for these variations. In that regard, the AG should not impose a mandatory requirement of MVAs or only permit MVAs tied to the maturity of the Fixed Income Asset Proxy. This flexibility would allow companies discretion on whether and how to provide an MVA, while maintaining equity between the consumer and company. Additionally, this would preserve consumer choice in an unbiased manner while limiting the disruption in the marketplace.

The items that we have raised through our questions and the requested language updates to the AG (attached) are outlined below:

#### **Clarifications focused on consumer choice and flexibility:**

##### **Allow a Market Value Adjustment (MVA) Term Length equal to the Index Strategy Term in addition to the maturity of the Fixed Income Asset Proxy**

This approach was included in previous ILVA Subgroup exposure drafts and aligns well with the principles of the guideline. This allows the MVA to be connected to a consumers' Index Strategy Term selection(s) while the company may design their Asset-Liability Management (ALM) practice around the

liability duration. Investment strategies may change over time, so it may become impractical to bring in determination of underlying asset duration in all situations.

In addition, this approach would allow for simplification of the MVA calculation for products with design features such as: multiple premiums in flexible premium contracts; commingling of funds in Index Strategies with different asset durations; reinvestment of Index Credits; and the existence of guaranteed death or living benefit features, if applicable. For example, a flexible premium contract could have an Index Strategy with some premium past the surrender charge period and some still within the surrender charge period (where there may be different investment strategy durations). This would be further complicated by varying durations of index credits from previous index strategy periods as well as benefit charges assessed against the index strategy for death or living benefit features. We have included an example in the attached Excel document to illustrate the need for the requested flexibility.

ALM practices are typically tied to liability duration. To allow this functionality within the guideline, the following update (**bolded**) should be made in the Text section:

“The market value of the Fixed Income Asset Proxy is its book value (using the yield from above) adjusted **for any applicable** market value adjustment formula (MVA) **either consistent with the Index Strategy Term or** appropriate for the maturity of the Fixed Income Asset Proxy.”

### **Applicability of MVAs**

Allowing ILVA designs without MVAs is consistent with ensuring more choice in the marketplace. Consumers who purchase ILVAs do so primarily to participate in equity performance while maintaining a level of downside protection. In many cases, interest rate exposure is not a primary motivation for investing in an ILVA contract, which can be shown as there are currently substantial consumer investments in both ILVAs that include MVAs and ILVAs that exclude MVAs.

ALM practices exist such as a cash flow matching strategy, where the underlying cash flows mature to support the policyholder value upon surrender. In these practices, an Interim Value without an MVA ensures consistency with the Hypothetical Portfolio and Interim Value preserving equity between the consumer and company.

Allowing for a Fixed Income Asset Proxy that does not apply an MVA is consistent with the equity principle set forth in the AG. We believe flexibility should be allowed to offer designs where no MVA is applied to accommodate consumer choice.

The following updates to the Guideline are necessary to address this concern. These updates would be required in the following sections in addition to the update (‘for any applicable’) outlined above (**bolded**):

*Drafting Note:* In determining the market value of the Fixed Income Asset Proxy an MVA **may be** applied to the book value of the fixed **income** assets to approximate the market value of the fixed income assets supporting the ILVAs.

*Certifications:* The market value adjustment, **if any**, applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value of the fixed



income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance.

*Descriptions:* The market value of the Fixed Income Asset Proxy including **any applicable** market value adjustment formula.

**Clarification focused on preserving equity and consistency between asset and interim values:**

The index-linked crediting strategies offered in ILVA products generally offer very straightforward point-to-point payment structures, for example, crediting an index return up to a cap. These simple, consumer friendly designs are critical for consumer understanding. In situations where the maturity of the Fixed Income Asset Proxy (for example 6 years) is longer than the Index Strategy Term (for example 1 year), the current draft could be interpreted to either (i) require the MVA also be part of the amount credited to the consumer or (ii) require that the MVA does not apply on a term end date.

- Requiring the MVA to be included in the Index Strategy Base (i.e., essentially credited to the account) conflicts with the point-to-point crediting of the product, would be very confusing to consumers, and would be disruptive to the overall ILVA market.
- If no MVA can apply on a term end date, it introduces potential for very negative consumer experiences due to significant variations in surrender values when crossing crediting anniversaries. This would also introduce inequities between persisting and lapsing consumers.

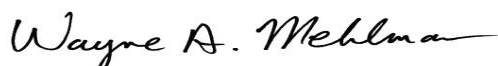
Our suggested edit resolves potential disconnects, clarifies that an MVA may be applicable on a term end date for surrender purposes, maintains simple product functionality, and preserves the AG principles (equity and consistency of asset and interim values). We request a modification to the first sentence in the Text section as follows (**bolded**):

The Index Strategy Base must equal the Strategy Value (**excluding any market value adjustment**) at the Index Strategy Term start date.

The ACLI and the CAI appreciate the opportunity to comment on this exposure and we urge LATF to consider our recommendations as it continues its progress towards a final AG.

Respectfully submitted,

AMERICAN COUNCIL OF LIFE INSURERS (ACLI)



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**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value (excluding any market value adjustment) at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the maturity of the fixed income assets supporting the ILVA, and with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.

The market value of the Fixed Income Asset Proxy is its book value, using the yield above, ~~adjusted using a~~ for any applicable market value adjustment formula (MVA) either consistent with the Index Strategy Term or appropriate for the maturity of the Fixed Income Asset Proxy.

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a Derivative Asset Proxy. In determining the market value of the Fixed Income Asset Proxy an MVA may be applied to the book value of the fixed income assets to approximate the market

value of the fixed income assets supporting the ILVAs. No additional MVA is applicable to Strategy Values or Interim Values.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and
  - e. The market value adjustment, if any, applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value of the fixed income assets supporting the ILVA and the formula

provides for reasonable equity between the contract holder and the insurance company.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. The market value of the Fixed Income Asset Proxy including ~~the~~ any applicable market value adjustment formula;
  - b. The market value of the Derivative Asset Proxy including any Trading Costs; and
  - c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

### **Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.



AMERICAN ACADEMY *of* ACTUARIES

*Objective. Independent. Effective.™*

November 2, 2022

Peter Weber  
Chair  
Index-Linked Variable Annuity (A) Subgroup  
National Association of Insurance Commissioners (NAIC)  
cc: Scott O'Neal

Re: LATF Exposure of Actuarial Guideline ILVA, Nonforfeiture Requirements for Index Linked Variable Annuity Products

Dear Pete:

On behalf of the American Academy of Actuaries<sup>1</sup> Index-Linked Variable Annuity (ILVA) Work Group (the “work group”), I appreciate the opportunity to provide comments on the proposed Actuarial Guideline ILVA.

First, the work group recommends a drafting note that clarifies that the actuarial guideline only addresses Interim Values and does not preclude having a market value adjustment (MVA) apply on the Index Strategy Term end date, because:

- It is important that there be continuity in the values provided to the consumer.
- It simplifies the consumer’s understanding of the product.

Second, the work group recommends a drafting note that clarifies that the use of an MVA in the calculation of the adjustment to the Fixed Income Asset Proxy for the Hypothetical Portfolio Values remain optional, because:

- Insurers may manage duration risk of their assets with a basket of bonds or other methods, therefore equity risk transfer to the policyholder would not be necessary through an MVA adjustment to the Fixed Income Asset Proxy.
- Contract holders may prefer products where insurers manage duration risk versus assessing an MVA to strategy values.
- MVAs can add complexity to products.
- Many MVAs tend to expire after the surrender charge period, which leads to different approaches to managing assets supporting policies after the surrender charge period (as the liability duration for these products may vary). Therefore, a more principle-based

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.



approach to handling the MVA adjustment to the Fixed Income Asset Proxy may be appropriate.

Third, the work group recommends the edits shown in the attached redline version *Actuarial Guideline ILVA Nonforfeiture Requirements for Index Linked Variable Annuity Products* draft to accomplish the following:

- Providing clarity on the MVA as an adjustment to the Fixed Income Asset Proxy, in which the maturity of the MVA adjustment is distinct from the length of the Index Strategy Term.
- Additional clarity.

Our work group appreciates the efforts of the Index-Linked Variable Annuity (A) Subgroup on this proposed actuarial guideline. If you have any questions or would like further dialogue on the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org)

Sincerely,

Beth Keith, MAAA, FSA  
Chairperson, Index-Linked Variable Annuity Work Group  
American Academy of Actuaries

**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others.—This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term “variable annuity”.

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as “contracts that provide for annuity benefits that vary according to the investment experience of a separate account.” Section 7B of NAIC Model 250 provides that “to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account, the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets.—Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount, or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the life insurance company.
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

**Commented [A1]:** For additional clarity.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed comprised of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

**Commented [A2]:** More accurate descriptor.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin, or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount, or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

**Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the Index Strategy Term maturity of the fixed income assets supporting the ILVA, and with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base, less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.

The market value of the Fixed Income Asset Proxy is its book value, using the yield above, adjusted using a market value adjustment formula (MVA) appropriate for the maturity of the Fixed Income Asset Proxy or other maturity terms such as Index Strategy Term or surrender charge period.

**Commented [A3]:** The maturity of the fixed income asset used in the calculation of the yield to apply to the book value in determining the Index Strategy base needs to coincide with the maturity of the Index Strategy Term.

**Commented [A4]:** The MVA is an adjustment to the Fixed Income Asset Proxy, not part of the Fixed Income Asset Proxy defined above. The market value of the Fixed Income Asset Proxy is equal to Fixed Income Asset Proxy +/- the MVA. The appropriate duration of the MVA could be the duration of the fixed income assets, the index strategy term or the surrender charge period.

**Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a

Derivative Asset Proxy.—In determining the market value of the Fixed Income Asset Proxy an MVA is applied to the book value of the fixed assets to approximate the market value of the fixed income assets supporting the ILVAs.—No additional MVA is applicable to Strategy Values or Interim Values.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

**Commented [A5]:** Could we break this into two, or even three, sentences?

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the life insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and
  - e. The market value adjustment applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value

**Commented [A6]:** For additional clarity

of the fixed income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance company.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. The market value of the Fixed Income Asset Proxy including the market value adjustment formula;
  - b. The market value of the Derivative Asset Proxy including any Trading Costs; and
  - c. All formulas, methodologies, and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

**Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.

**Allow a Market Value Adjustment (MVA) Term Length equal to the Index Strategy Term in addition to**

Simplify MVA calculation for products with design features such as:

Multiple premiums in flexible premium contracts; Commingling of funds in Index Strategies with different assets

**Flexible Premium Contract Example**

Withdrawal Charge Period 6 years for each new contribution

Investment strategy

Asset duration = remaining withdrawal charge period, max 6 years for new contribution

Asset duration = index strategy term when money is out of withdrawal charge period

Index Strategy Term 1 year

Index Strategy Start Date	Contribution Date:	Index Strategy Term			MVA Term
		1/15/2023	1/15/2027	1/15/2030	
1/15/2023		1	1	1	6
1/15/2024		1	1	1	5
1/15/2025		1	1	1	4
1/15/2026		1	1	1	3
1/15/2027		1	1	1	2
1/15/2028		1	1	1	1
1/15/2029		1	1	1	1
1/15/2030		1	1	1	1
1/15/2031		1	1	1	1
1/15/2032		1	1	1	1
1/15/2033		1	1	1	1
1/15/2034		1	1	1	1

MVA Term always equal to Index Strategy Term

**o the maturity of the Fixed Income Asset Proxy**

et durations;

Asset Duration	
1/15/2027	1/15/2030
6	
5	
4	
3	6
2	5
1	4
1	3
1	2



**Different MVA Terms due to  
 different asset durations  
 in the same Index Strategy**



Draft: 11/22/22

Life Actuarial (A) Task Force  
Virtual Meeting  
October 27, 2022

The Life Actuarial (A) Task Force met Oct. 27, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Mark Fowler represented by Sheila Travis (AL); Ricardo Lara represented by Ahmad Kamil and Elaine Lam (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Heard Update on the ESG Field Test

Hemphill discussed the history of the NAIC's economic scenario generator (ESG) project, noting limitations with the ESG developed by the American Academy of Actuaries (Academy) and that the Academy would no longer maintain its ESG beyond making it available in its current form. She said that as the Academy considered its ESG proprietary, it was not an option for the NAIC to take over the Academy's ESG and make modifications to address the limitations. To select a replacement for the Academy's ESG, Hemphill said that the NAIC worked with state insurance regulators, industry representatives, and Academy representatives to develop a request for proposal (RFP) along with criteria for vendor selection. She said that Conning was then selected through a competitive RFP process.

Hemphill noted that state insurance regulators, subject matter experts (SMEs) from the industry and the Academy, NAIC staff, and Conning have worked collaboratively to refine the calibration of Conning's ESG to meet the objectives of regulators. She said that this was an iterative process as acceptance criteria were defined, feedback was received from SMEs, and Conning made changes to its ESG. Hemphill said that state insurance regulators eventually desired a field test to gain a better understanding of the materiality of some of the technical items relating to the ESG calibration and model form. She noted that going into the field test, state insurance regulators did not feel that their work with the ESG was done and instead expected to use the information to continue to refine the technical requirements of the ESG.

Hemphill said that the NAIC is happy with the support that Conning has provided throughout the process. She also noted the challenging nature of the ESG project and the appreciation that state insurance regulators and the NAIC have for the effort that industry and Academy SMEs and field test participants have put into the project. She thanked these groups and noted that state insurance regulators look forward to continuing to work collaboratively to implement a new ESG for U.S statutory reserve and capital purposes.

Scott O'Neal (NAIC) then provided an update on the NAIC's ESG field test, noting that the actual amount of participation in terms of the number of insurance groups, legal entities, and field test runs was slightly lower than what ESG field test participants had indicated in a previous survey. O'Neal noted, however, that there was still a large amount of participation that would be more than sufficient to capture the impacts of the field test. Finally, he said that the NAIC planned on bringing a subset of the results of the field test to the discussion at the Task Force's session at the Fall National Meeting.

2. Heard a Presentation from the Academy ESGWG on a Simplified Corporate Model and Associated Stylized Facts and Acceptance Criteria

Jason Kehrberg (Academy) delivered the background portion of the Academy Economic Scenario Generator Working Group's (ESGWG) presentation (Attachment Three-A) on an independent set of corporate model stylized facts and acceptance criteria along with a proposed simplified corporate model. He noted that this presentation fit into a series of presentations that the Academy has been delivering on the overall ESG project.

Hal Pedersen (Academy) then discussed the Academy's recommended corporate stylized facts that could be fit into two broad categories: 1) those that relate to corporate credit spreads; and 2) those that relate to bond index fund returns. Pedersen then went into the details of Academy's six stylized facts. Kehrberg noted that the stylized facts recommended by the Academy for the corporate model are generally consistent with what the NAIC's ESG vendor, Conning, has presented in the past. Yanacheak asked if stylized fact 1c and 3a from the presentation implied that the equity model should be regime-switching. Pedersen noted that the Academy's intent was not to suggest that a regime-switching equity model should be used and that there could be systemic risks in the credit market that are not necessarily experienced in the equity market, and vice versa.

Iouri Karpov (Academy) noted that the Academy is recommending a set of acceptance criteria that are consistent with the defaults and spreads that are prescribed in VM-20, Requirements for Principle-Based Reserves for Life Products, along with a simplified model that meets these acceptance criteria. The simplified model is fully documented, specified, and calibrated and has gone through a peer review process. One key difference between the Conning GEMS Corporate model and the simplified model is that the simplified model implicitly captures the impact of credit migrations, defaults, and recoveries whereas these components are explicitly modeled in GEMS. Kehrberg noted that the simplified corporate model produces excess spreads (over treasuries) and would need to be implemented on top of a Treasury model.

Hemphill asked if the presentation could be posted to the NAIC's web page. O'Neal noted that he would post the presentation to the NAIC's principle-based reserving (PBR) web page under the Stylized Facts and Acceptance Criteria header and notify the Task Force's distribution when this is done.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/10 27/Oct 27 Minutes.docx

# Corporate Credit & Bond Fund Returns: Stylized Facts, Acceptance Criteria, and a Simplified Model

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October 27, 2022

## Agenda—Corporate Credit & Bond Fund Returns

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1. Background
2. Stylized Facts
3. Acceptance Criteria
4. A Simplified Model
5. Discussion and Q&A
6. Appendices

# 1.

## Background

## Background

LATF asked the ESGWG to deliver a series of presentations focused on proposing qualitative **Stylized Facts** and quantitative **Acceptance Criteria** for the three major components of an ESG used for statutory reporting purposes: **Interest Rates, Equity Returns, and Corporate Bond Fund Returns.**

### *Prior presentations in this series:*

- A Framework for Working with ESGs (8/8/22)
- ESG Governance Considerations (8/8/22)
- Equity Returns—Stylized Facts (8/9/22)

### *This and future presentations in this series:*

- **Corporate Credit & Bond Fund Returns—Stylized Facts, Acceptance Criteria, and a Simplified Model**
- Interest Rates—Stylized Facts and Acceptance Criteria
- Equity Returns—Acceptance Criteria

Background (continued)

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This presentation proposes **Stylized Facts** and **Acceptance Criteria** for Corporate Credit Spreads and Bond Index Fund Returns that (a) are independent of any specific ESG model, (b) can be used to identify and evaluate candidate ESG models, and (c) can be used to evaluate a set of stochastic scenarios.

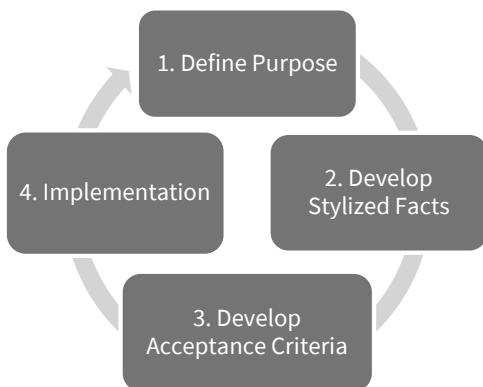
In addition to Stylized Facts and Acceptance Criteria, this presentation also proposes a **Simplified Model**.

- Regulators expressed interest in the ESGWG proposing an alternative corporate bond fund return model that is **fully documented** so that the model can be appropriately reviewed and understood.
- Like GEMS, the simplified model simulates **four** U.S. corporate bond fund indices →

Label	Bond Fund Index
<b>IG 1-5</b>	U.S. Corp. Investment Grade 1-5 year
<b>IG 5-10</b>	U.S. Corp. Investment Grade 5-10 year
<b>IG Long</b>	U.S. Corp. Investment Grade Long (10-30 year)
<b>HY</b>	U.S. Corp. High Yield (Below Investment Grade)

A framework for developing, implementing, and evaluating ESGs and the scenario sets they produce

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- 1. Define Purpose:** The intended purpose of the ESG informs the economic variables to be simulated and the relative importance of their “stylized facts.”
- 2. Develop Stylized Facts:** Stylized facts describe properties of the economic variables to be simulated. They are based on historical market data and economic theory and are prioritized relative to the defined purpose at hand. The establishment of stylized facts is critical for selecting candidate ESG models and a key prerequisite for the development of acceptance criteria.
- 3. Develop Acceptance Criteria:** A set of quantitative metrics or target values at different time horizons or in different economic conditions used to ensure the scenarios produced by the ESG are consistent with defined stylized facts.
- 4. Implementation:** ESG models are selected based on their ability to reflect defined stylized facts, then calibrated in accordance with acceptance criteria. Scenario sets are validated against defined acceptance criteria. This is an iterative process. It is important to periodically review and recalibrate the ESG as market conditions change over time.

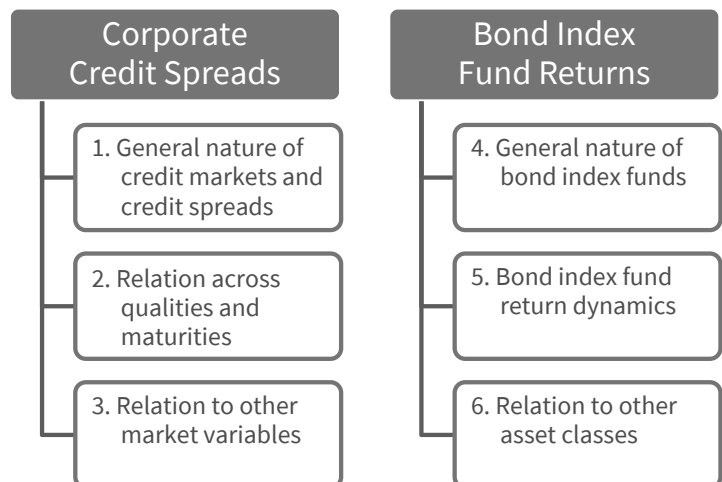
# 2.

## Stylized Facts

## Groupings for Stylized Facts

Stylized Facts have been grouped into 6 categories with 1 to 3 Stylized Facts each:

- 3 categories for **Corporate Credit Spreads**
- 3 categories for **Bond Index Fund Returns**



## 1. Corporate Credit Spreads—General nature of credit markets and credit spreads

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- a. Credit markets tend to be cyclical with elevated defaults and migrations at the end of credit cycles. Credit-related losses tend to be “lumpy” or episodic.
- b. Credit spreads are positive and have a strong tendency to revert to long-term normative levels (generally within three to four years).
- c. Credit spreads exhibit volatility clustering (i.e., regimes of high and low volatility), and volatility has a strong tendency to revert to long-term normative levels.

## 2. Corporate Credit Spreads—Relation across qualities and maturities

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- a. As a bond’s credit quality decreases credit spreads, spread volatility, and the risk of loss increase.
- b. Longer maturity bonds generally have higher credit spreads than shorter maturity bonds. However, the credit spreads on shorter maturity bonds are more sensitive to current market conditions, so during market stresses credit spreads on shorter maturity bonds may increase more than credit spreads on longer maturity bonds.
- c. Credit spreads for different qualities and maturities tend to be strongly correlated (e.g., 80% or more).

### 3. Corporate Credit Spreads—Relation to other market variables

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- a. Credit spreads tend to be higher and more volatile in equity bear markets (i.e., strong positive correlation to equity volatility, strong negative correlation to equity returns).
- b. Credit spreads tend to be negatively correlated with Treasury rates (i.e., flight to quality during market stress).

### 4. Bond Index Fund Returns—General nature of bond index funds

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- a. A corporate bond fund is generally actively managed (regularly rebalanced) to meet defined maturity and quality targets (e.g., 5- to 10-year investment grade bonds) by trading individual bonds into and out of the fund. Such trading tends to increase when the corporate bond market experiences high levels of credit migration.



## 5. Bond Index Fund Returns—Bond index fund return dynamics

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- a. Bond index fund total returns reflect the impact of risk-free rates (and changes in risk-free rates) as well as credit-related returns in “excess” of risk-free rates.
  - **Total return** = Risk free return + Excess return
  - **Excess return** = Spread-based return - Frictional costs
  - **Spread-based return** reflects credit spread income and price returns (i.e., changes in market price due to spread movement).
  - **Frictional costs** reflect costs due to defaults (net of recoveries), migrations (e.g., selling downgraded bonds at a loss when they no longer meet the fund’s quality targets), and rebalancing.
- b. Bond index fund returns vary with the credit cycle.
  - **Spread-based return** tends to decline significantly when spreads explode but then recover as spreads mean revert and migrations/defaults occur (i.e., the portfolio is purged).
  - **Frictional costs** (which are generally not recoverable) tend to cluster and accumulate rapidly as bonds migrate/default, with severity depending on the magnitude and duration of the credit cycle.

## 6. Bond Index Fund Returns—Relation to other asset classes

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- a. Bond funds have risk/reward relationships that are generally consistent with other asset classes over long horizons.
- b. Credit spreads for bond funds held in the separate account should be consistent with economic assumptions for bonds held in the general account.

## Goals related to bond fund scenarios from Conning/NAIC 12/17/20 presentation to LATF

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### Goals relating to equity and bond fund scenarios:

1. Returns should be provided for funds representative of those offered in U.S. insurance products.
2. The ESG should be calibrated using an appropriate historical period.

### Goals relating to the bond fund scenarios:

8. The same model should be used to produce bond fund returns for the Basic and Robust Data Sets\*, and the returns should reflect credit rating transitions, defaults, and dynamic spreads.
9. Separate yield curves should be generated by rating, and they should be linked to each other.
10. The spread between Treasuries and corporate bonds should be stochastic.
11. The ESG should include bond credit rating transitions and they should be dynamic.

\* Only goals that were related to the bond fund scenarios are listed above (goals 3-7 were only related to the equity scenarios).

- These goals are generally consistent with the stylized facts presented on the prior two slides.
- Note that stylized facts are generally *prioritized* based on the intended application, but the stylized facts themselves are generally independent of the intended application (largely based on historical data, sometimes supplemented with forward looking views).
- Note that stylized facts and their prioritization are generally independent of the model since models differ in their ability to reflect the various market properties described by stylized facts.

# 3.

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## Acceptance Criteria

Given the intended purpose, acceptance criteria should be consistent with the Valuation Manual

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VM-20 Section 9.F. prescribes deterministic tables of baseline defaults, current spreads, and ultimate spreads for projecting general account **individual bonds**.

- VM-20 prescribed spreads grade from current to ultimate over the first four years of the projection.
- VM-20 prescribed baseline default costs represent the annualized average default cost over the remaining life of a bond given its credit rating and weighted average life at the start of the projection.

The ESG produces bond fund returns for projecting separate account **bond funds**.

- These bond fund return scenarios should be consistent with VM-20’s prescribed tables of spreads and defaults for use when projecting individual bonds in the general account.
- Bond fund indices experience significant frictional costs compared to individual bonds that are bought and held (largely from having to periodically rebalance bonds in the fund as they move outside the fund’s target range for credit quality, or maturity).

Credit spread steady-state targets and mean reversion should be consistent with VM-20

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Steady state credit spread targets:

- Determined by averaging VM-20 general account fixed income ultimate spreads at [12/31/21].

Steady state credit spread targets	IG 1-5	IG 5-10	IG Long	HY
Quality range	[Aa3/AA- to Baa1/BBB+]	[Aa3/AA- to Baa1/BBB+]	[Aa3/AA- to Baa1/BBB+]	[Ba3/BB- to B1/B+]
Maturity (WAL) range	[1 to 5 years]	[>5 to 10 years]	[>10 to 30 years]	[1 to 10 years]
Target (avg. VM-20 ult. spread at [12/31/21])	<b>107 bps</b>	<b>141 bps</b>	<b>163 bps</b>	<b>448 bps</b>

Mean reversion of credit spreads:

- VM-20 prescribes a 4-year grading period for general account fixed income spreads.
- Let “m” = the number of months into the projection when the average modeled credit spread is **halfway** between initial and steady state levels.
- Acceptance criteria: “m” should be between [22] and [26] (i.e., around two years).

Target excess returns are derived from average VM-20 spreads and the historical relationship between excess returns and Option-Adjusted Spread (OAS)

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Historical averages (1999 to 2021) from Bloomberg (bps)	IG 1-5	IG 5-10	IG Long	HY
Option Adjusted Spread (OAS)	124	156	1.80	534
Spread Return (determined from OAS and duration series)	129	168	1.95	559
Excess Return	98	100	88	311
Frictional Cost (Spread Return - Excess Return)	31	68	107	248

Historical OAS split –Frictional Cost vs. Excess Return	IG 1-5	IG 5-10	IG Long	HY
Frictional Cost % of OAS	25%	44%	60%	46%
Excess Return % of OAS	75%	56%	40%	54%

Steady state targets (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target Excess Return (Target OAS * Excess Return % of OAS)	80	79	66	240
Criteria for avg. annualized Excess Return in years [20-30]*	80 ±[10]	79 ±[10]	66 ±[10]	240 ±[20]

- Frictional Cost % of OAS increases with fund maturity, as longer debt incurs higher migration costs in the IG corporate universe.
- IG 5-10 and HY both have maturities of about seven years as well as similar Frictional Cost % of OAS.
- Documentation on Bloomberg’s excess return definitions/calculations (pp. 85-88 of linked doc)

Proposed cap on maximum excess return

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The acceptance criteria on the previous slide ensures the **average** (across all scenarios) modeled excess return in years [20-30] is close to the target excess return.

The additional guardrail below protects against overly optimistic risk/reward relationships in an individual scenario.

- Rationale: The high spreads observed during periods of market stress have generally been offset by increased frictional costs and decreased performance of bond index funds (especially for IG Long and HY). Over the long term the upside on credit returns appears limited (capped).
- Let “a” = Target OAS (i.e., average VM-20 ultimate spread at [12/31/21]) + [50 bps].
- Let “b” = any one scenario’s annualized excess return over years [20-30] of the projection.
- “b” should not exceed “a”.

Illustrative application of additional guardrail (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target OAS + 50 bps (“a”)	157	191	213	498
Max annualized excess return over years [20-30]:				
Scenario Set ABC (“b”)	190	160	200	660
Scenario Set XYZ (“b”)	140	120	160	350

## Bond fund returns are correlated with equity returns and interest rates (and with other bond fund indices)

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Modeled Spreads for bond indices should reflect a strong relationship to equity (SPX).

- Positive correlation of [60% ±10%] to SPX Variance
- Negative correlation of [-60% ± 10%] to SPX Return

Credit risk tends to increase during volatile bear markets, which increases credit spreads.

Note: Acceptance criteria for the correlation of *total* bond index fund returns to equity and interest rates could also be developed.

Modeled Excess Returns for bond indices should also reflect a strong relationship to equity; but directionally inverse to Modeled Spreads.

- Negative correlation to SPX Variance
- Positive correlation to SPX Return

Frictional costs tend to increase during volatile bear markets, which also decreases excess returns.

Modeled Spreads and Excess Returns should reflect a very strong relationship across bond indices.

- Very similar dynamics → Correlations between bond fund indices should be greater than [80%].

Supporting Data:  
 Historical Correlations between Spread and Equity/Interest Rate Markets

	Int Rate Level	SPX Variance	SPX Return	IG 1-5 Spread	IG 5-10 Spread	IG Long Spread	HY Spread	Data Period
Int Rate Level	1.00							12/1960 - 12/2021
SPX Variance	0.02	1.00						12/1960 - 12/2021
SPX Return	-0.09	-0.68	1.00					12/1960 - 12/2021
IG 1-5 Spread	-0.18	0.52	-0.54	1.00				1/1990 - 12/2021
IG 5-10 Spread	-0.27	0.59	-0.63	0.92	1.00			1/1999 - 12/2021
IG Long Spread	-0.30	0.57	-0.60	0.82	0.94	1.00		1/1990 - 12/2021
HY Spread	-0.32	0.62	-0.67	0.80	0.87	0.84	1.00	11/1995 - 12/2021

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# 4.

## A Simplified Model

## A simplified model for returns on corporate bond fund indices

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The simplified model is consistent with Conning's previously presented goals and the ESGWG's recommended stylized facts and acceptance criteria.

The simplified model is fully documented, specified, and calibrated. It has been peer reviewed and is ready for implementation.

The model simulates excess returns on the same four corporate bond fund indices.

- Excess return = Spread-based return – Frictional costs.
- Ultimately, Total return (Treasury return + Excess return) would be simulated by adding excess returns to appropriately calculated and internally consistent returns on government bond funds of similar maturity profiles.

The model is simplified in that it implicitly reflects the impact of credit migration and defaults.

- For each of the funds in GEMS, the simplified model derives excess credit-related returns using stochastic credit spreads by rating but reflects the impact of credit migration, defaults, and recoveries as simplified frictional costs.
- The historically implied frictional cost is fitted using a linear functional relationship between the trailing OAS and the costs to rebalance the fund. This fitting approach ensures the frictional cost is positive and increases with the spread.

## A simplified model for returns on corporate bond fund indices (cont.)

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Steady-state credit spread targets and mean reversion speeds are consistent with VM-20 general account fixed income spreads.

Duration is estimated as a function of bond maturity and bond yield.

- The model captures fluctuations in long maturity fund durations observed when the level of yield changes.

Modeled relationship between credit spreads

- We propose a single random driver for all the indices to ensure rational behavior of credit spreads and capture 90% of spread variation across the indices.

Relationship to Equity and Interest Rates

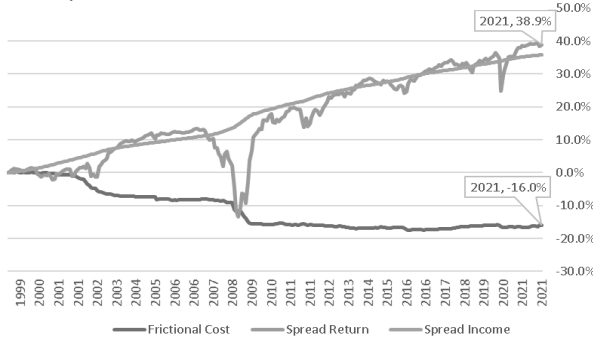
- Using a simplified correlation matrix, the model captures relationships between credit spreads, equity volatility, equity return, interest rate level, and interest rate volatility.
- This correlation matrix approach can be used to generate stochastic bond index fund excess returns which are consistent with any underlying stochastic interest rate and/or equity model.

## Simplified decomposition of bond index excess return into spread return and frictional cost

$Excess\ Return = Spread\ Return - Frictional\ Cost$ , where:

- $Spread\ Return_t = Spread_{t-1}\Delta t - Duration_{t-1}(Spread_t - Spread_{t-1})$  reflects the earned credit spread as well as the change in market price due to spread movement.
- $Frictional\ Cost$  reflects the effects of defaults, migrations, and otherwise forced rebalancing that occurs within the index fund.

Components of Cumulative Excess Returns: IG 5-10



- Cumulative Excess Return from 1999 to 2021 was 22.9% (100bps/year), as a combination of 38.9% in spread return (average OAS of 168bps) offset by frictional losses of 16% (70bps/year).
- Spread Return was calculated using Bloomberg OAS and duration time series, while the implied Frictional Cost was calculated as Excess Return less Spread Return.
- Spread Return varies with level of spreads, but ultimately reverts to earned spread income.
- Frictional Cost tends to be relatively stable, with costs accruing aggressively in early 1990s, 2000s (.com bubble) and in 2008 (financial crisis) as defaults and migrations punctuate the end of a credit cycle.

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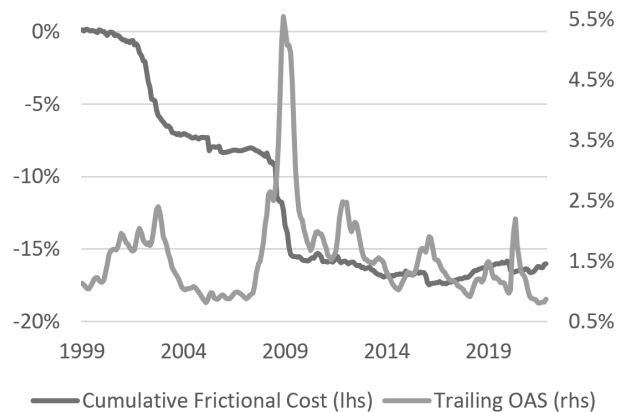
## Spread and frictional cost dynamics—Historical behavior

OAS exhibits strong mean reversion, zero bound, and clustering. These dynamics, which drive the volatility of Excess Return, are native to a lognormal Ornstein-Uhlenbeck “OU” process.

Cumulative Frictional Cost exhibits a relatively smooth step-like progression with most of the costs occurring during periods of elevated spreads (e.g., during breaks in the credit cycle).

Note: The relationship between spreads, equity returns, and interest rates is captured by correlating the random factors based on the historical correlation of spread residuals.

Spreads and Frictional Costs (IG 5-10)



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## Spread and frictional cost dynamics—Simplified modeling

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**Credit Spreads:** Simplified model based on mean reverting stochastic processes for each credit rating.

$ls_t = \min(ls_{t-1} + \beta(\ln(\tau) - ls_{t-1}) + \sigma Z_{ls,t}, \max\_spread)$  where  $spread_t = e^{ls_t}$  subject to reasonable cap,  $ls_0 = \ln(\text{init\_spread})$ ,  
 $\tau$  = Target OAS (adj), and  $\beta$  = mean reversion.

**Frictional Cost:** Simplified model based on trailing 3-month credit spreads.

$cost_t = a + m_1 \min(\bar{s}_t, \kappa) + m_2 \max(\bar{s}_t - \kappa, 0)$  where  $\bar{s}_t = \frac{1}{3} \sum_{i=1,3} spread_{t-i}$  is the 3-month trailing avg spread, and  $a$  = drift.

**Excess Return:** Simplified model based on Excess Return = Spread Return – Frictional Cost.

$Excess\ Return_t = [spread_t \Delta t - \frac{1}{2}(Dur_t + Dur_{t-1})(spread_t - spread_{t-1})] - cost_t$  where:

$Dur_t$  is duration of the underlying fund based on its assumed maturity and semi-annual coupon determined as  $coup_t = UST_{t,mat} + spread_t$ .

$Dur_t$  is determined using the closed-form approximation  $Dur_t = .5(cS_n + nx^n)$  where  $c = \max(\frac{1}{2}coup_t, .000001)$ ,  $n = 2 \times maturity$ ,

$x = \frac{1}{1+c}$ , and  $S_n = \frac{x - (n+1)x^{n+1} + nx^{n+2}}{(1-x)^2}$  is the partial sum representing par-coupon durations, while  $nx^n$  represents the duration of the principal payment.

## Calibration of the Spread component

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The Spread component is calibrated to monthly historical OAS data sourced from relevant Bloomberg indices using Maximum Likelihood Estimation (MLE).

Index	Bloomberg Ticker	Data Period	Avg. Quality	Avg. Maturity (years)	Avg. OAS (basis points)	Avg. VM-20 Ultimate Spreads at 12/2021 (basis points)
U.S. Corp. IG 1-5	BUC1TRUU	1/1990 - 12/2021	A2 - Baa1	3	112	107
U.S. Corp. IG 5-10	BCR5TRUU	1/1999 - 12/2021	A2 - Baa1	7	156	141
U.S. Corp. IG Long (10-30)	LD07TRUU	1/1990 - 12/2021	A2 - Baa1	23	152	163
U.S. Corp. HY	LF98TRUU	11/1995 - 12/2021	Ba3 - B2	7	509	448

- A single shared random factor is used for all four indices to ensure reasonable relationships between indices (captures 90% of spread variation across the indices).
- Spread mean reversion ( $\beta$ ) was set to 3% for all four bond fund indices to ensure reasonable relationships between indices and consistency with VM-20's 4-year grading period.
- Spread volatility ( $\sigma$ ) was adjusted accordingly to preserve historical steady state process variance.
- Spread targets ( $\tau$ ) were adjusted to ensure average modeled spreads align with Target OAS (average VM-20 ultimate spread at [12/31/21]).



## Calibration of the Frictional Cost component

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The Frictional Cost component is calibrated to implied 3-month trailing frictional costs:

- Uses the same Bloomberg index data used to calibrate the Spread component.
- Implied frictional cost is determined as the difference between Bloomberg's excess return data and a spread return calculated using Bloomberg's historical duration and OAS data.

The calibration is performed using least squares optimization with constraints:

- Constraint: Drift ( $a$ )  $\geq .0001$  (ensures a minimum cost).
- Constraint: Multipliers  $m_1 \geq 0$  for IG and  $m_1 \geq .001$  for HY (ensures dynamic behavior when spreads are low).
- A penalty function is used to constrain cumulative estimated cost to equal historical Frictional Cost during the calibration period (ensures modeled costs will be in line with historical spread levels).

Final adjustments:

- Drift ( $a$ ) for IG Long was lowered to .0001 to align with the historical ratio of frictional cost to OAS.

## Proposed parameter values

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*Parameters for the simplified model  
of excess returns on bond index funds*

### Spread Model

	IG 1-5	IG 5-10	IG Long	HY
<b>tau</b> ( $\tau$ , spread target)	0.00920	0.01298	0.01493	0.04134
<b>beta</b> ( $\beta$ , mean rev.)	0.03	0.03	0.03	0.03
<b>sigma</b> ( $\sigma$ , volatility)	0.13557	0.09756	0.10181	0.09565
<b>maturity</b>	3.0	7.0	23.0	7.0
<b>max_spread</b>	0.06900	0.05900	0.05000	0.18329
<b>init_spread</b> (12/31/20)	0.00468	0.00893	0.01403	0.03601
VM-20 spread target	0.01069	0.01408	0.01627	0.04475

### Frictional Cost Model

	IG 1-5	IG 5-10	IG Long	HY
<b>drift</b> ( $a$ )	0.00010	0.00010	0.00010	0.00010
<b>kappa</b> ( $\kappa$ )	0.01239	0.01362	0.01556	0.03650
<b>mult1</b> ( $m_1$ )	0.00000	0.00000	0.00448	0.00100
<b>mult2</b> ( $m_2$ )	0.06265	0.13773	0.18706	0.12111

*Parameters (correlations) for implementing the simplified  
model alongside existing interest and equity models.*

### Simplified Corr. Matrix based on ACLI v1.3 & SLV Equity

	Rate Log Vol	Log Long Rate	SPX Log Vol	SPX Return	Credit Spread
Rate Log Vol	1.00				
Log Long Rate	0.00	1.00			
SPX Log Vol	0.00	0.00	1.00		
SPX Return	0.00	0.00	-0.63	1.00	
Credit Spread	0.20	-0.35	-0.55	-0.60	1.00

### Simplified Corr. Matrix based on GEMS GFF rates & Heston Equity

	CIR ("level")	SPX Variance	SPX Return	Credit Spread
CIR ("level")	1.00			
SPX Variance	0.00	1.00		
SPX Return	0.00	-0.68	1.00	
Credit Spread	-0.25	0.60	-0.60	1.00

Excess return cumulative wealth factors—comparison to GEMS

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The simplified model satisfies the acceptance criteria by design (its parameters were explicitly set to meet the criteria).

However, since GEMS results were readily available, and as an additional reasonableness check, the next four slides provide a comparison to GEMS.

- GEMS excess returns were determined by taking total returns from the four corporate bond fund indices and subtracting total returns from government bond fund indices with similar maturity profiles.

Summary

- **IG 1-5** and **IG 5-10**: Simplified model and GEMS cumulative excess return distributions are relatively similar.
- **IG Long**: Simplified model cumulative excess return distribution is generally lower than GEMS.
- **HY**: Simplified model cumulative excess returns are significantly lower than GEMS in the right tail of the distribution.

Excess return cumulative wealth factors—IG 1-5

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IG 1-5: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.62	0.53	0.54	0.67	0.76	1.01	1.05
0.5%	0.81	0.75	0.84	0.94	1.06	1.22	1.45
1.0%	0.83	0.79	0.90	1.00	1.14	1.29	1.51
2.5%	0.87	0.85	0.96	1.09	1.24	1.41	1.62
5.0%	0.90	0.91	1.02	1.16	1.32	1.50	1.72
10.0%	0.93	0.96	1.09	1.24	1.41	1.61	1.84
25.0%	0.98	1.05	1.19	1.36	1.55	1.77	2.02
50.0%	1.02	1.13	1.29	1.47	1.68	1.92	2.19
75.0%	1.06	1.19	1.36	1.56	1.79	2.05	2.34
90.0%	1.10	1.24	1.42	1.62	1.87	2.15	2.46
95.0%	1.11	1.26	1.44	1.66	1.91	2.20	2.52
97.5%	1.13	1.27	1.47	1.68	1.94	2.24	2.57
99.0%	1.14	1.29	1.49	1.72	1.98	2.28	2.63
99.5%	1.15	1.30	1.50	1.73	2.00	2.31	2.66
Max	1.19	1.35	1.56	1.81	2.09	2.41	2.84

IG 1-5: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.81	0.86	0.89	0.87	0.99	1.07	1.15
0.5%	0.90	0.93	1.00	1.07	1.15	1.23	1.33
1.0%	0.92	0.96	1.03	1.10	1.18	1.28	1.37
2.5%	0.94	0.98	1.06	1.14	1.24	1.34	1.46
5.0%	0.97	1.01	1.09	1.18	1.29	1.41	1.55
10.0%	0.99	1.04	1.13	1.24	1.36	1.50	1.65
25.0%	1.02	1.08	1.20	1.34	1.50	1.67	1.87
50.0%	1.05	1.14	1.30	1.47	1.68	1.91	2.17
75.0%	1.07	1.20	1.41	1.65	1.92	2.22	2.56
90.0%	1.09	1.26	1.54	1.85	2.20	2.59	3.04
95.0%	1.10	1.30	1.63	2.00	2.40	2.88	3.40
97.5%	1.11	1.34	1.72	2.16	2.63	3.18	3.77
99.0%	1.12	1.40	1.87	2.36	2.93	3.56	4.22
99.5%	1.13	1.45	1.95	2.56	3.19	3.84	4.60
Max	1.18	1.87	2.65	3.89	4.30	5.79	6.83

Excess return cumulative wealth factors—IG 5-10

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IG 5-10: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.85	0.76	0.76	0.81	0.86	0.95	0.96
0.5%	0.93	0.88	0.92	0.94	0.98	1.03	1.09
1.0%	0.94	0.91	0.94	0.97	1.01	1.05	1.11
2.5%	0.95	0.93	0.96	1.00	1.04	1.09	1.14
5.0%	0.96	0.95	0.98	1.02	1.07	1.12	1.17
10.0%	0.97	0.97	1.01	1.05	1.10	1.15	1.20
25.0%	0.99	1.00	1.04	1.08	1.13	1.18	1.23
50.0%	1.00	1.02	1.07	1.11	1.16	1.22	1.27
75.0%	1.01	1.04	1.09	1.14	1.19	1.24	1.30
90.0%	1.02	1.05	1.10	1.15	1.21	1.26	1.32
95.0%	1.03	1.06	1.11	1.16	1.22	1.27	1.34
97.5%	1.03	1.06	1.11	1.17	1.22	1.28	1.35
99.0%	1.03	1.07	1.12	1.17	1.23	1.29	1.36
99.5%	1.03	1.07	1.12	1.18	1.24	1.30	1.37
Max	1.04	1.08	1.14	1.20	1.26	1.32	1.41

IG 5-10: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.86	0.81	0.78	0.83	0.87	0.89	0.91
0.5%	0.91	0.88	0.92	0.95	0.98	1.02	1.06
1.0%	0.92	0.91	0.94	0.97	1.00	1.04	1.08
2.5%	0.94	0.93	0.96	1.00	1.03	1.07	1.12
5.0%	0.95	0.95	0.98	1.02	1.06	1.10	1.14
10.0%	0.97	0.97	1.01	1.04	1.08	1.13	1.17
25.0%	0.99	1.00	1.04	1.08	1.13	1.17	1.22
50.0%	1.00	1.03	1.07	1.12	1.17	1.22	1.28
75.0%	1.01	1.04	1.09	1.14	1.20	1.26	1.32
90.0%	1.02	1.05	1.10	1.16	1.22	1.29	1.36
95.0%	1.02	1.06	1.11	1.17	1.24	1.31	1.38
97.5%	1.02	1.06	1.12	1.18	1.25	1.32	1.40
99.0%	1.02	1.06	1.12	1.19	1.26	1.34	1.43
99.5%	1.02	1.06	1.13	1.20	1.27	1.36	1.45
Max	1.02	1.07	1.16	1.25	1.36	1.45	1.62

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Excess return cumulative wealth factors—IG Long

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IG Long: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.61	0.57	0.57	0.60	0.56	0.67	0.65
0.5%	0.77	0.68	0.71	0.73	0.76	0.78	0.83
1.0%	0.80	0.71	0.74	0.76	0.80	0.82	0.87
2.5%	0.84	0.77	0.80	0.83	0.86	0.89	0.93
5.0%	0.87	0.82	0.85	0.88	0.91	0.95	0.98
10.0%	0.90	0.87	0.90	0.94	0.97	1.01	1.05
25.0%	0.95	0.96	0.99	1.03	1.07	1.11	1.15
50.0%	1.01	1.04	1.08	1.12	1.16	1.21	1.25
75.0%	1.05	1.10	1.14	1.18	1.24	1.29	1.34
90.0%	1.09	1.15	1.19	1.24	1.29	1.35	1.40
95.0%	1.11	1.17	1.22	1.26	1.32	1.38	1.44
97.5%	1.12	1.19	1.24	1.28	1.35	1.40	1.47
99.0%	1.14	1.21	1.26	1.31	1.37	1.43	1.50
99.5%	1.15	1.22	1.27	1.33	1.39	1.45	1.53
Max	1.20	1.28	1.32	1.41	1.46	1.53	1.63

IG Long: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.73	0.63	0.60	0.68	0.71	0.78	0.78
0.5%	0.82	0.77	0.81	0.86	0.88	0.93	0.97
1.0%	0.84	0.80	0.84	0.89	0.92	0.98	1.02
2.5%	0.87	0.85	0.89	0.94	0.98	1.03	1.08
5.0%	0.90	0.88	0.93	0.98	1.03	1.08	1.13
10.0%	0.93	0.93	0.97	1.03	1.08	1.13	1.19
25.0%	0.97	0.99	1.04	1.10	1.15	1.22	1.28
50.0%	1.00	1.04	1.10	1.17	1.23	1.30	1.38
75.0%	1.03	1.08	1.15	1.22	1.30	1.38	1.46
90.0%	1.04	1.11	1.19	1.27	1.36	1.44	1.53
95.0%	1.05	1.12	1.21	1.29	1.38	1.48	1.57
97.5%	1.06	1.13	1.22	1.31	1.40	1.50	1.60
99.0%	1.06	1.14	1.24	1.33	1.43	1.54	1.64
99.5%	1.07	1.16	1.25	1.35	1.45	1.56	1.66
Max	1.08	1.19	1.30	1.41	1.55	1.63	1.80

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Excess return cumulative wealth factors—HY

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HY: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.93	0.90	0.93	0.95	0.99	1.02	1.09
0.5%	0.97	0.95	0.98	1.02	1.05	1.09	1.13
1.0%	0.98	0.96	1.00	1.03	1.06	1.10	1.15
2.5%	0.98	0.98	1.01	1.04	1.08	1.12	1.16
5.0%	0.99	0.99	1.02	1.05	1.09	1.13	1.18
10.0%	0.99	1.00	1.03	1.06	1.11	1.15	1.20
25.0%	1.00	1.01	1.04	1.08	1.13	1.18	1.23
50.0%	1.00	1.02	1.06	1.10	1.16	1.21	1.27
75.0%	1.00	1.02	1.07	1.13	1.19	1.25	1.31
90.0%	1.01	1.03	1.09	1.15	1.21	1.28	1.34
95.0%	1.01	1.04	1.09	1.16	1.22	1.29	1.37
97.5%	1.01	1.04	1.10	1.17	1.24	1.31	1.38
99.0%	1.01	1.04	1.11	1.18	1.26	1.33	1.40
99.5%	1.01	1.05	1.11	1.19	1.27	1.34	1.42
Max	1.01	1.06	1.15	1.24	1.31	1.41	1.50

HY: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.92	0.91	0.93	0.96	0.98	1.00	1.03
0.5%	0.96	0.96	0.99	1.02	1.04	1.07	1.10
1.0%	0.97	0.97	1.00	1.03	1.05	1.08	1.12
2.5%	0.97	0.98	1.01	1.04	1.07	1.10	1.13
5.0%	0.98	0.99	1.02	1.05	1.08	1.11	1.14
10.0%	0.99	1.00	1.03	1.06	1.09	1.12	1.16
25.0%	1.00	1.01	1.04	1.07	1.11	1.14	1.18
50.0%	1.00	1.02	1.05	1.09	1.12	1.16	1.20
75.0%	1.00	1.03	1.06	1.10	1.14	1.19	1.23
90.0%	1.01	1.03	1.07	1.11	1.16	1.21	1.27
95.0%	1.01	1.03	1.07	1.12	1.17	1.23	1.29
97.5%	1.01	1.03	1.08	1.13	1.19	1.25	1.32
99.0%	1.01	1.04	1.08	1.14	1.20	1.28	1.35
99.5%	1.01	1.04	1.09	1.15	1.22	1.30	1.38
Max	1.01	1.05	1.11	1.21	1.33	1.53	1.75

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# 5.

## Discussion and Q&A

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Thank You

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### Contact:

- Amanda Barry-Moilanen, Life Policy Analyst, [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org)

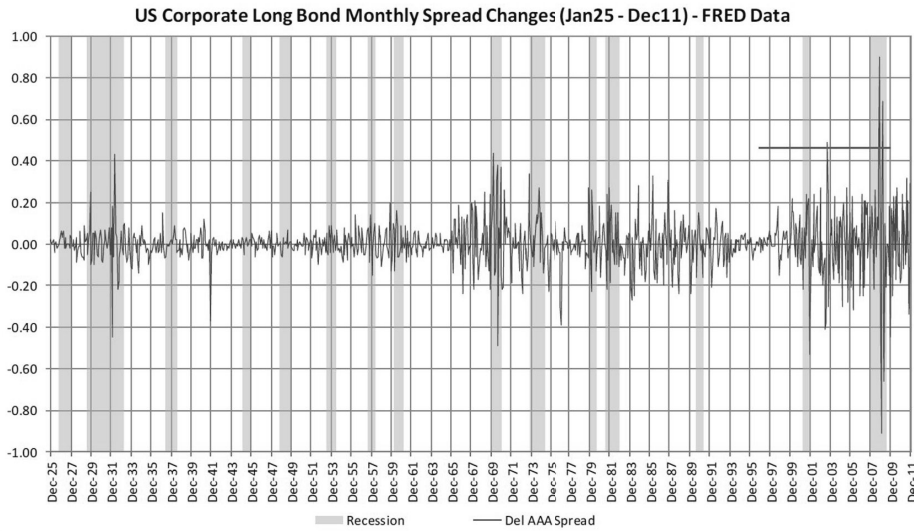
38

# 6.1

## Appendix 1: Support for Stylized Facts

Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1925–2011

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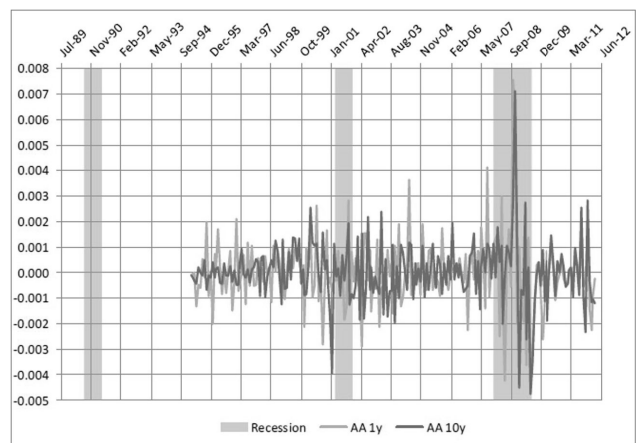
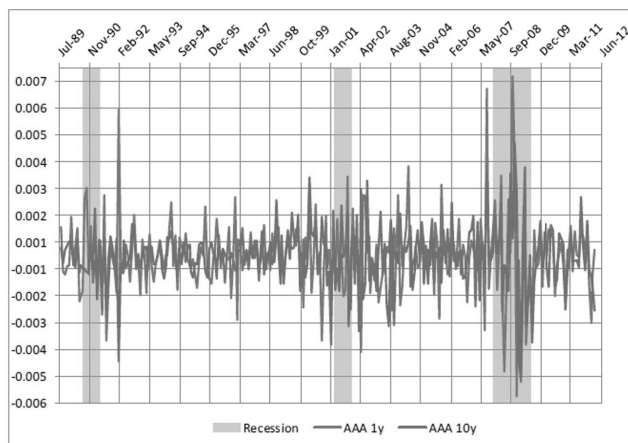
Source: *Economic Scenario Generators: A Practical Guide (SOA, 2016)*

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Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1989–2012 (AAA, AA)

40



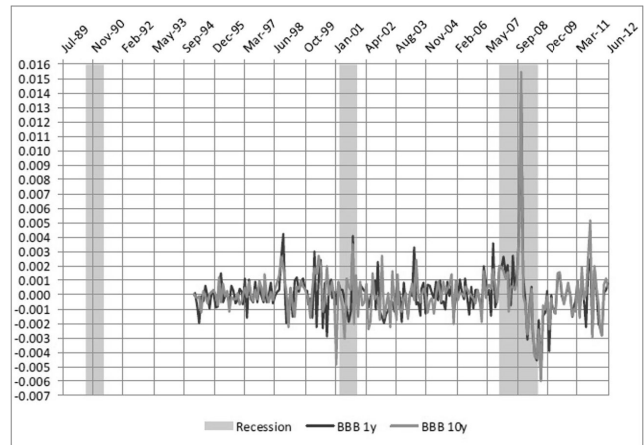
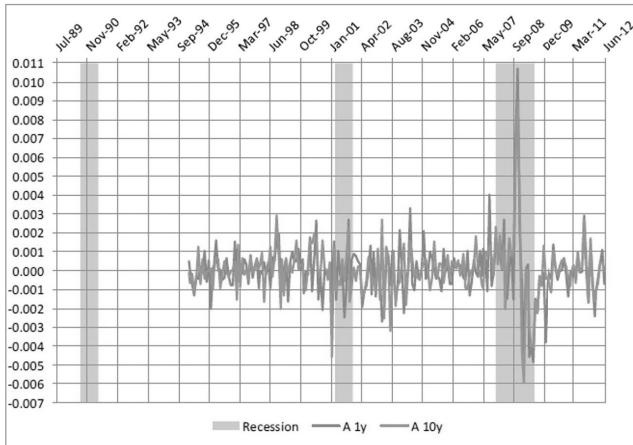
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Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1989–2012 (A, BBB)

41



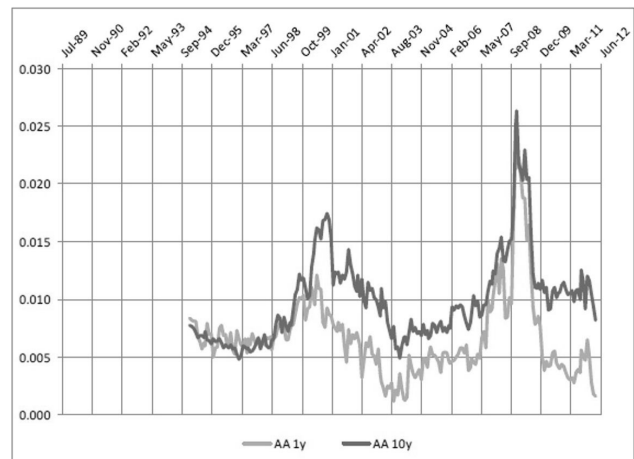
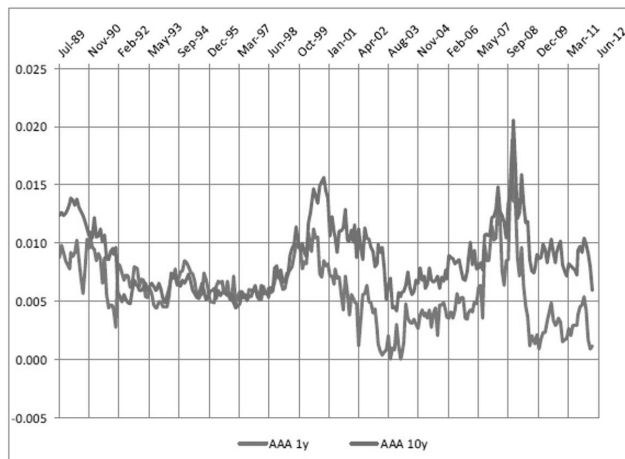
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Support for Stylized Facts:  
 Spreads for U.S. industrial zero-coupon bonds, 1989–2012 (AAA, AA)

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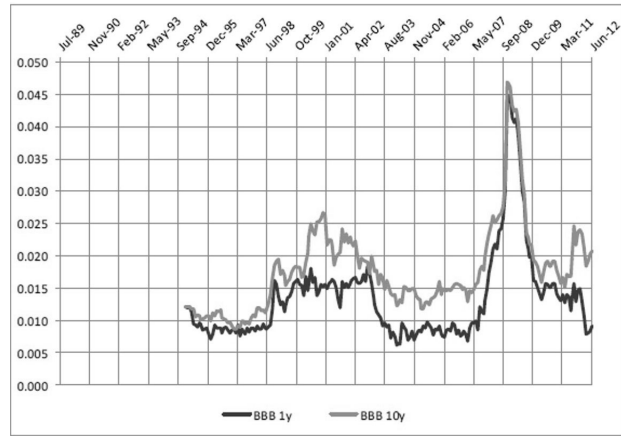
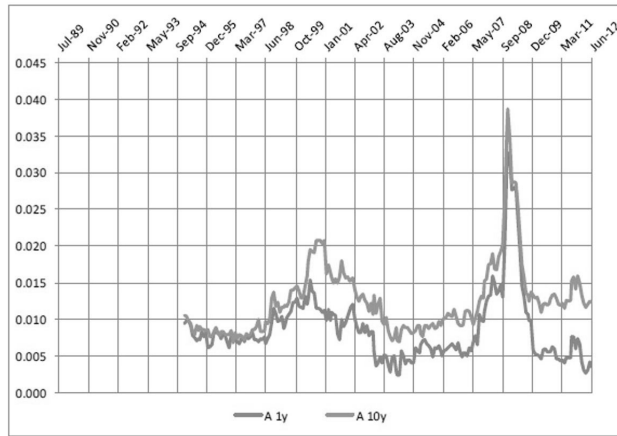
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Support for Stylized Facts:  
 Spreads for U.S. industrial zero-coupon bonds, 1989–2012 (A, BBB)

43



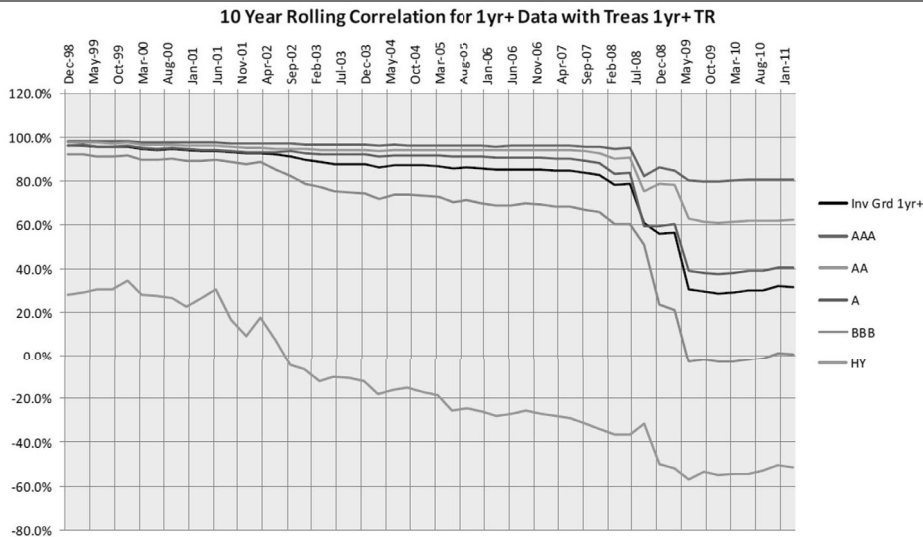
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Support for Stylized Facts:  
 Correlations between corporate bonds and Treasuries, 1998–2011

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# 6.2

## Appendix 2: Support for Acceptance Criteria

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### Determining targets from VM-20 steady state spreads at 12/31/21

WAL	Aaa AAA	Aa1 AA+	Aa2 AA	Aa3 AA-	A1 A+	A2 A	A3 A-	Baa1 BBB+	Baa2 BBB	Baa3 BBB-	Ba1 BB+	Ba2 BB	Ba3 BB-	B1 B+	B2 B	B3 B-	Caa1 CCC+	Caa2 CCC	Caa3 CCC-	Ca CC
1	37.01	46.90	56.78	64.93	73.08	81.23	98.73	116.22	133.72	218.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
2	42.33	53.95	65.58	74.14	82.69	91.25	109.41	127.57	145.72	224.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
3	47.64	61.01	74.38	83.35	92.31	101.27	120.09	138.91	157.73	230.71	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
4	52.96	68.07	83.18	92.55	101.92	111.29	130.77	150.25	169.73	236.71	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
5	59.45	74.31	89.17	99.51	109.85	120.19	140.42	160.65	180.88	242.28	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
6	65.94	80.55	95.16	106.47	117.78	129.08	150.07	171.05	192.03	247.86	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
7	68.50	84.18	99.86	110.50	121.14	131.79	152.75	173.72	194.69	249.19	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
8	71.07	87.81	104.55	114.53	124.51	134.49	155.44	176.39	197.34	250.51	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
9	73.63	91.44	109.25	118.56	127.88	137.19	158.12	179.06	199.99	251.84	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
10	75.37	93.27	111.17	120.30	129.44	138.58	159.70	180.83	201.95	252.82	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
11	77.11	95.10	113.08	122.05	131.01	139.97	161.28	182.59	203.90	253.79	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
12	78.85	96.92	115.00	123.79	132.57	141.36	162.86	184.36	205.86	254.77	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
13	80.59	98.75	116.92	125.53	134.14	142.75	164.44	186.12	207.81	255.75	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
14	82.33	100.58	118.84	127.27	135.70	144.14	166.01	187.89	209.77	256.73	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
15	84.07	102.41	120.76	129.01	137.27	145.53	167.59	189.66	211.72	257.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
16	85.81	104.24	122.68	130.76	138.84	146.92	169.17	191.42	213.68	258.68	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
17	87.54	106.07	124.59	132.50	140.40	148.31	170.75	193.19	215.63	259.66	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
18	89.28	107.90	126.51	134.24	141.97	149.70	172.33	194.96	217.59	260.64	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
19	91.02	109.73	128.43	135.98	143.53	151.09	173.90	196.72	219.54	261.61	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
20	92.76	111.56	130.35	137.73	145.10	152.47	175.48	198.49	221.50	262.59	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
21	94.50	113.39	132.27	139.47	146.67	153.86	177.06	200.26	223.45	263.57	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
22	96.24	115.21	134.19	141.21	148.23	155.25	178.64	202.02	225.41	264.55	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
23	97.98	117.04	136.11	142.95	149.80	156.64	180.22	203.79	227.36	265.52	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
24	99.72	118.87	138.02	144.69	151.36	158.03	181.79	205.56	229.32	266.50	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
25	101.46	120.70	139.94	146.44	152.93	159.42	183.37	207.32	231.27	267.48	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
26	103.20	122.53	141.86	148.18	154.49	160.81	184.95	209.09	233.23	268.46	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
27	104.94	124.36	143.78	149.92	156.06	162.20	186.53	210.86	235.18	269.43	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
28	106.68	126.19	145.70	151.66	157.63	163.59	188.11	212.62	237.14	270.41	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
29	108.42	128.02	147.62	153.40	159.19	164.98	189.68	214.39	239.09	271.39	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
30	110.16	129.85	149.53	155.15	160.76	166.37	191.26	216.15	241.05	272.37	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32

Source: VM-20 Tables H & I at 12/31/21

	Quality Range	WAL Range	Avg. Spread
IG 1-5	[Aa3 - Baa1] [AA- - BBB+]	[1 to 5 yrs]	<b>107</b>
IG 5-10	[Aa3 - Baa1] [AA- - BBB+]	[>5 to 10 yrs]	<b>141</b>
IG Long	[Aa3 - Baa1] [AA- - BBB+]	[>10 to 30 yrs]	<b>163</b>
HY	[Ba3 - B1] [BB- - B+]	[1 to 10 yrs]	<b>448</b>

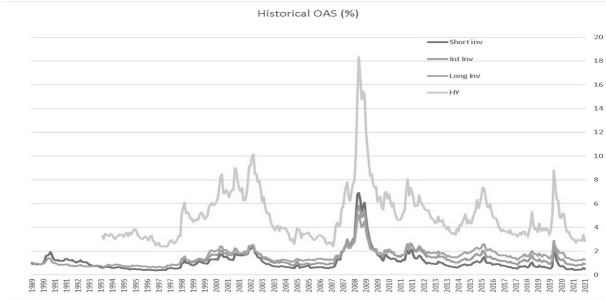
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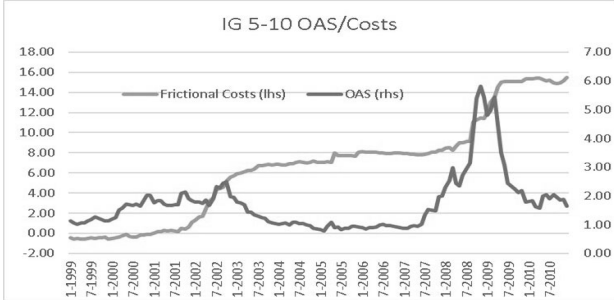
## Spread and frictional cost dynamics—History

47

- OAS exhibits mean reversion, 0-bound and clustering (OU process).
- Excess Return exhibits volatility driven by spread dynamics.



- Frictional Cost exhibits spikes at the break of the credit cycle when spreads are elevated.



Simplified Decomposition of Bond Fund Excess Return:

$$\text{Excess Return} = \text{Spread Return} - \text{Frictional Cost}, \text{ where } \text{Spread Return}_t = \text{Spread}_{t-1} \Delta t - \text{Duration}_{t-1} (\text{Spread}_t - \text{Spread}_{t-1})$$

- *Spread Return* reflects the earned credit spread as well as the change in market price due to spread movement.
- *Frictional Cost* reflects the effects of defaults, migrations, and otherwise forced rebalancing that occurs within the bond fund.

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# 6.3

## Appendix 3: Additional Detail on Simplified Model

## Adjustments to spread parameters

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### Adjustments:

- Beta ( $\beta$ , mean reversion) set to 3% to ensure reasonable spread relationships between indices.
- Sigma ( $\sigma$ , volatility) adjusted to preserve steady state process variance:  $\sigma^2/(2\beta-\beta^2)$ .
- Tau ( $\tau$ , spread target) is adjusted to ensure the steady state mean aligns with the VM-20 target and accounts for the convexity in the log-OU process.

Unadjusted (Historical) Parameters				
	IG 1-5	IG 5-10	IG Long	HY
tau ( $\tau$ )	0.01069	0.01408	0.01627	0.04475
beta ( $\beta$ )	0.02927	0.03613	0.01951	0.03443
sigma ( $\sigma$ )	0.13394	0.10690	0.08231	0.10235
maturity	3.0	7.0	23.0	7.0
max_spread	0.06900	0.05900	0.05000	0.18329
init_spread	0.00468	0.00893	0.01403	0.03601
VM-20 target	0.01069	0.01408	0.01627	0.04475



Adjusted Parameters				
	IG 1-5	IG 5-10	IG Long	HY
tau ( $\tau$ )	0.01069	0.01408	0.01627	0.04475
beta ( $\beta$ )	0.02927	0.03613	0.01951	0.03443
sigma ( $\sigma$ )	0.13394	0.10690	0.08231	0.10235
maturity	3.0	7.0	23.0	7.0
max_spread	0.06900	0.05900	0.05000	0.18329
init_spread	0.00468	0.00893	0.01403	0.03601
VM-20 target	0.01069	0.01408	0.01627	0.04475

## Principle Components Analysis (PCA) Analysis

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The PCA 1 (“Parallel”) factor accounts for 90% of historical variation across modeled indices.

→ Use a single random variable for all four indices to ensure reasonable relationships between indices.

- Beta ( $\beta$ , mean reversion) set to 3% to ensure reasonable spread relationships between indices.
- Sigma ( $\sigma$ , volatility) adjusted to preserve steady state process variance:  $\sigma^2/(2\beta-\beta^2)$ .
- Tau ( $\tau$ , spread target) is adjusted to ensure the steady state mean aligns with the VM-20 target and accounts for the convexity in the log-OU process.

Eigenvector decomposition				
	PCA 1	PCA 2	PCA 3	PCA 4
IG 1-5	0.01069	0.01408	0.01627	0.04475
IG 5-10	0.02927	0.03613	0.01951	0.03443
IG Long	0.13394	0.10690	0.08231	0.10235
HY	3.0	7.0	23.0	7.0
Eigenvalue	0.06900	0.05900	0.05000	0.18329
R <sup>2</sup>	0.00468	0.00893	0.01403	0.03601

Historical correlations between indices				
	IG 1-5	IG 5-10	IG Long	HY
IG 1-5	1.000			
IG 5-10	0.920	1.000		
IG Long	0.822	0.938	1.000	
HY	0.797	0.871	0.836	1.000

## A simplified correlation matrix

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Correlations between spread and equity/interest rate drivers are based on the historical correlation of spread residuals.

- Correlations between the bond indices were derived using overlapping historical periods from 1/1999 to 12/2021.
- Correlations with equity and interest rate factors were derived based on all available data above.
- Correlations below 11% were set to 0% for brevity.
- Correlations between credit and other market factors were averaged and rounded to nearest 5% for simplicity.

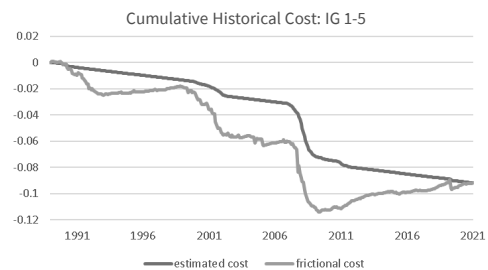
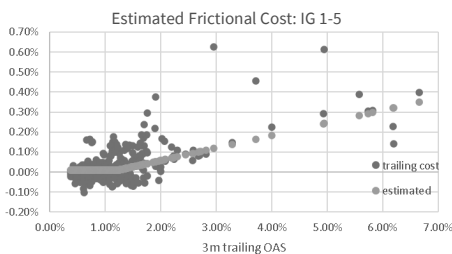
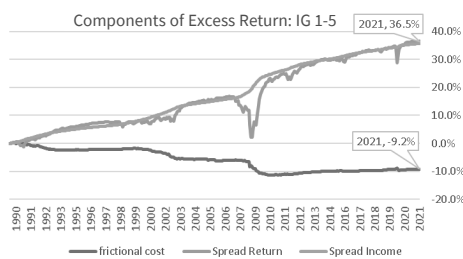
	CIR 1	CIR 2	CIR 3	SPX Var	SPX Ret	IG 1-5	IG 5-10	IG Long	HY
CIR 1	1.00								
CIR 2	0.00	1.00							
CIR 3	0.00	0.00	1.00						
SPX Var	0.00	0.00	0.00	1.00					
SPX Ret	0.00	0.00	0.00	-0.68	1.00				
IG 1-5	0.00	0.00	-0.18	0.52	-0.54	1.00			
IG 5-10	0.00	0.00	-0.27	0.59	-0.63	0.92	1.00		
IG Long	0.00	0.00	-0.30	0.57	-0.60	0.82	0.94	1.00	
HY	0.00	0.00	-0.32	0.62	-0.67	0.80	0.87	0.84	1.00



	CIR 1	CIR 2	CIR 3	SPX Var	SPX Ret	Spread
CIR 1	1.00					
CIR 2	0.00	1.00				
CIR 3	0.00	0.00	1.00			
SPX Var	0.00	0.00	0.00	1.00		
SPX Ret	0.00	0.00	0.00	-0.68	1.00	
Spread	0.00	0.00	-0.18	0.52	-0.54	1.00

## Historical statistics: IG 1-5

52

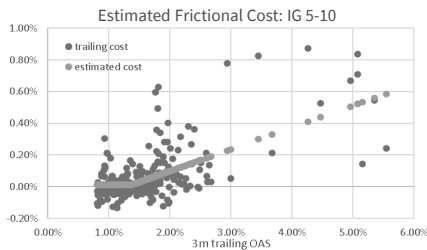
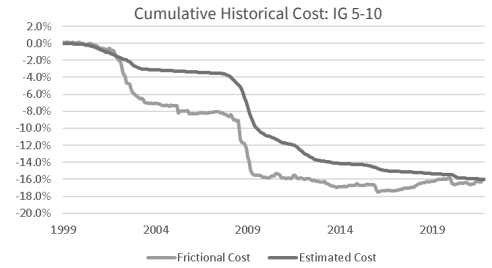
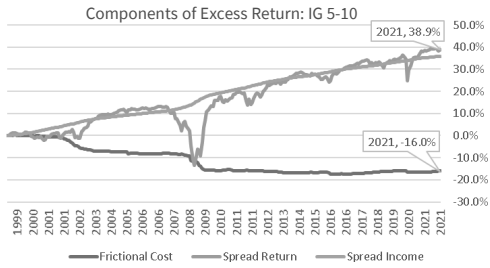


Frictional Cost Model Parameters: IG 1-5

	IG 1-5
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.01239
mult1 ( $m_1$ )	0.00000
mult2 ( $m_2$ )	0.06265

## Historical statistics: IG 5-10

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### Frictional Cost Model Parameters: IG 5-10

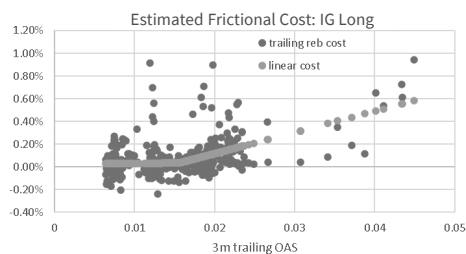
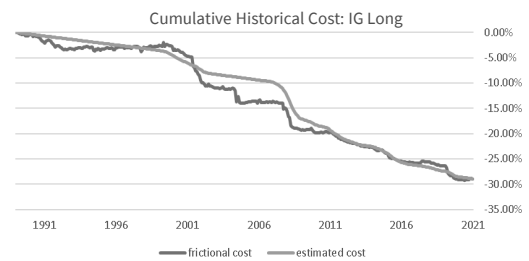
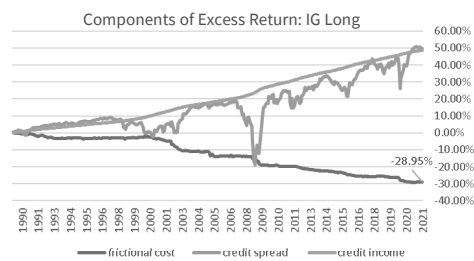
	IG 5-10
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.01362
mult1 ( $m_1$ )	0.00000
mult2 ( $m_2$ )	0.13773

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## Historical statistics: IG Long

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### Frictional Cost Model Parameters: IG Long

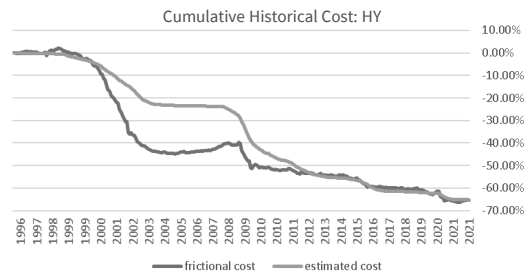
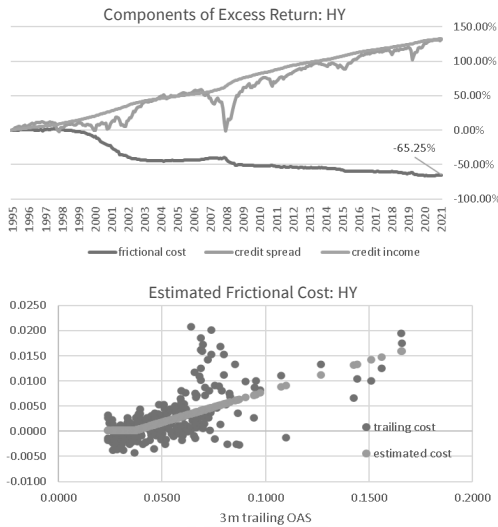
	IG Long
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.01556
mult1 ( $m_1$ )	0.00448
mult2 ( $m_2$ )	0.18706

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## Historical statistics: HY

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Frictional Cost Model Parameters: HY

	HY
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.03650
mult1 ( $m_1$ )	0.00100
mult2 ( $m_2$ )	0.12111

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## Simulation results compared to targets

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Average excess returns are aligned with historically implied targets and meet acceptance criteria for average annualized Excess Return.

The standard deviation (volatility) of monthly excess returns in the scenarios scale with maturity and lower quality (as expected).

Steady state Targets (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target Excess Return (Target OAS * Excess Return % of OAS)	80	79	66	240
Criteria for avg. annualized Excess Return in years [20-30]*	80 ±[10]	79 ±[10]	66 ±[10]	240 ±[20]

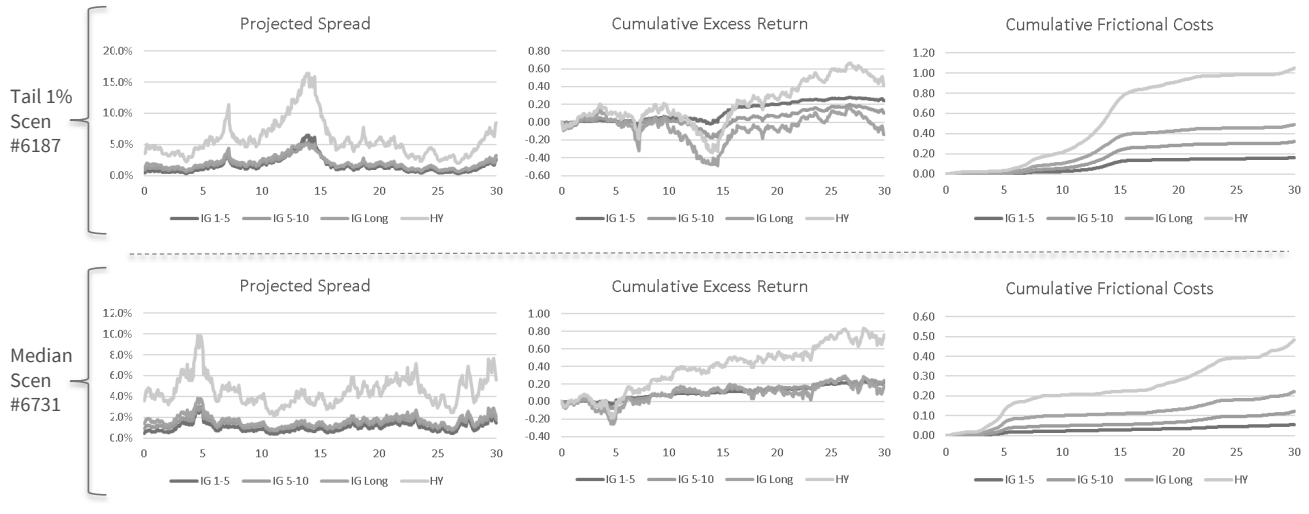
Simulation results (10,000 scenarios)	IG 1-5	IG 5-10	IG Long	HY
Avg. annualized Excess Return (bps)	72	78	69	256
Std. dev. annualized Excess Return (bps)	1.61%	3.06%	8.57%	8.63%

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Two sample scenarios: Tail 1% and Median

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Draft: 11/3/22

Life Actuarial (A) Task Force  
E-Vote  
October 24, 2022

The Life Actuarial (A) Task Force conducted an e-vote that concluded Oct. 24, 2022. The following Task Force members participated: Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Khalil (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen (MN); Chlora Lindley-Myers represented by William Leung (MO); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); Jon Pike represented by Tomasz Serbinowski (UT); and Allan L. McVey (WV).

1. Adopted its 2023 Proposed Charges

The Task Force conducted an e-vote to consider adoption of its 2023 proposed charges (Attachment Four-A). The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint\NAIC Support Staff Hub\Member Meetings\A CMTE\LATF\2022 Fall\LATF Calls\October Charges E-Vote\Oct 24 Minutes.docx



Draft: 10/27/22

*Adopted by the Executive (EX) Committee and Plenary, TBD*

*Adopted by the Life Insurance and Annuities (A) Committee, TBD*

*Adopted by the Life Actuarial (A) Task Force, Oct. 24, 2022*

## 2023 Proposed Charges

### LIFE ACTUARIAL (A) TASK FORCE

The mission of the Life Actuarial (A) Task Force is to identify, investigate, and develop solutions to actuarial problems in the life insurance industry.

#### Ongoing Support of NAIC Programs, Products, or Services

1. The **Life Actuarial (A) Task Force** will:

- A. Work to keep reserve, reporting, and other actuarial-related requirements current. This includes principle-based reserving (PBR) and other requirements in the *Valuation Manual*, actuarial guidelines, and recommendations for appropriate actuarial reporting in blanks. Respond to charges from the Life Insurance and Annuities (A) Committee and referrals from other groups or committees, as appropriate.
- B. Report progress on all work to the Life Insurance and Annuities (A) Committee and provide updates to the Financial Condition (E) Committee on matters related to life insurance company solvency. This work includes the following:
  - i. Work with the American Academy of Actuaries (Academy) and the Society of Actuaries (SOA) to develop new mortality tables for valuation and minimum nonforfeiture requirements, as appropriate, for life insurance and annuities.
  - ii. Provide recommendations for guidance and requirements for accelerated underwriting (AU) and other emerging underwriting practices, as needed.
  - iii. Evaluate and provide recommendations regarding the VM-21, Requirements for Principle-Based Reserves for Variable Annuities/*Actuarial Guideline XLIII—CARVM for Variable Annuities* (AG 43) standard projection amount (SPA), which may include continuing as a required floor or providing as disclosure. This evaluation is to be completed prior to year-end 2023.
  - iv. Work with the SOA on the annual development of the Generally Recognized Expense Table (GRET) factors.
  - v. Provide recommendations and changes, as appropriate, to other reserve and nonforfeiture requirements to address issues, and provide actuarial assistance and commentary to other NAIC committees relative to their work on actuarial matters.
  - vi. Work with the selected vendor to develop and implement the new economic scenario generator (ESG) for use in regulatory reserve and capital calculations.
  - vii. Monitor international developments regarding life and health insurance reserving, capital, and related topics. Compare and benchmark these with PBR requirements.

2. The **Experience Reporting (A) Subgroup** will:

- A. Continue the development of the experience reporting requirements within the *Valuation Manual*. Provide input, as appropriate, for the process regarding the experience reporting agent, data collection, and subsequent analysis and use of experience submitted.

**LIFE ACTUARIAL (A) TASK FORCE (*continued*)**

3. The **Indexed Universal Life (IUL) Illustration (A) Subgroup** will:
  - A. Consider changes to *Actuarial Guideline XLIX-A—The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest to Policies Sold On or After December 14, 2020 (AG 49-A)*, as needed. Provide recommendations for the consideration of changes to the *Life Insurance Illustrations Model Regulation (#582)* to the Task Force, as needed.
4. The **Index-Linked Variable Annuity (A) Subgroup** will:
  - A. Provide recommendations and changes, as appropriate, to nonforfeiture, or interim, value requirements related to index-linked variable annuities (ILVAs).
5. The **Longevity Risk (E/A) Subgroup** of the Life Actuarial (A) Task Force and the Life Risk-Based Capital (E) Working Group will:
  - A. Provide recommendations for recognizing longevity risk in statutory reserves and/or risk-based capital (RBC), as appropriate.
6. The **Variable Annuities Capital and Reserve (E/A) Subgroup** of the Life Risk-Based Capital (E) Working Group and the Life Actuarial (A) Task Force will:
  - A. Monitor the impact of the changes to the variable annuities (VA) reserve framework and RBC calculation and determine if additional revisions need to be made.
  - B. Develop and recommend appropriate changes, including those to improve accuracy and clarity of VA capital and reserve requirements.
7. The **Valuation Manual (VM)-22 (A) Subgroup** will:
  - A. Recommend requirements, as appropriate, for non-variable (fixed) annuities in the accumulation and payout phases for consideration by the Task Force. Continue working with the Academy on a PBR methodology for non-variable annuities.

NAIC Support Staff: Scott O’Neal/Jennifer Frasier

SharePoint/NAIC Support Staff Hub/Committee Charges/2023/01\_Draft Charges

Draft: 11/22/22

Life Actuarial (A) Task Force  
Virtual Meeting  
October 13, 2022

The Life Actuarial (A) Task Force met Oct. 13, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Exposed the Actuarial Guideline ILVA Draft

Weber said that the charge of the Index-Linked Variable Annuity (A) Subgroup was to provide recommendations or changes as appropriate to nonforfeiture requirements related to index-linked variable annuities (ILVAs). He said the Subgroup's proposed Actuarial Guideline ILVA Draft (AG ILVA Draft) (Attachment Five-A) created a framework for determining the conditions that an ILVA product could be considered a variable annuity and, therefore, exempt from the nonforfeiture requirements of the Standard Nonforfeiture Law for Individual Deferred Annuities (#805) and consistent with the nonforfeiture requirements of the Variable Annuity Model Regulation (#250).

Leung asked if the surrender value on anniversary date would also be market-value adjusted under the AG ILVA Draft. Weber noted that the market-value adjustment would only apply to interim values as currently written.

Yanacheak inquired as to whether companies would be expected to refile their products ahead of the effective date of the AG ILVA Draft or if state insurance regulators would need to reach out to companies with products they expected would not be compliant. Weber noted that it would be up to companies first to determine whether their products are compliant but that he also expects that states would do some reaching out to companies that have products that may not be compliant.

Brian Bayerle (American Council of Life Insurers—ACLI) noted that the AG ILVA Draft was an important step in the regulation of a growing product segment. He said that the ACLI had questions (Attachment Five-B) for state insurance regulators and interested parties to consider during the next exposure of the AG ILVA Draft.

Weber made a motion, seconded by Tsang to expose the AG ILVA Draft and questions for a period of 21 days. During discussion of the motion, Chupp asked whether a wording change should be made to clarify that the strategy value should be before any market-value adjustment. After much discussion, it was decided that this should be an area for feedback during the comment period.

Boston asked whether the AG ILVA Draft defined the required nonforfeiture amounts or the minimum nonforfeiture amounts. Weber noted that some states may choose to view the nonforfeiture amounts as a minimum and allow amounts in excess of the values defined in the AG ILVA Draft. Katie Campbell (NAIC) noted that the language in the AG ILVA Draft stated that the nonforfeiture values companies provide should be materially

consistent with how they are defined within the AG ILVA Draft. She said that once nonforfeiture values are determined according to the AG ILVA Draft, Model #250 should be referred to determine whether they are minimums.

Birny Birnbaum (Center for Economic Justice—CEJ) stated that the questions that were envisioned to be exposed alongside the AG ILVA Draft should be withdrawn, as they may emphasize certain issues over others that may be as or more important. He also questioned how a potentially similar product issued before the effective date of the AG ILVA would have different interim value requirements than a product issued after the effective date and noted that is an issue that Task Force may want comments on. Weber noted that despite the exposure of the questions alongside the AG ILVA Draft, the entirety of the AG ILVA Draft was on the table for commenters to opine on and that it was common practice of the Task Force to expose questions alongside drafts. Hemphill noted that the exposure could specify that feedback on the questions was in addition to general feedback on the AG ILVA Draft.

After discussion, the motion passed unanimously for a 21-day public comment period ending Nov. 2.

Having no further business, the Life Actuarial (A) Task Force adjourned.

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**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the maturity of the fixed income assets supporting the ILVA, and with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.

The market value of the Fixed Income Asset Proxy is its book value, using the yield above, adjusted using a market value adjustment formula (MVA) appropriate for the maturity of the Fixed Income Asset Proxy.

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a Derivative Asset Proxy. In determining the market value of the Fixed Income Asset Proxy an

MVA is applied to the book value of the fixed assets to approximate the market value of the fixed income assets supporting the ILVAs. No additional MVA is applicable to Strategy Values or Interim Values.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and
  - e. The market value adjustment applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value



of the fixed income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance company.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. The market value of the Fixed Income Asset Proxy including the market value adjustment formula;
  - b. The market value of the Derivative Asset Proxy including any Trading Costs; and
  - c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

**Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.

**In addition to general feedback on the draft Actuarial Guideline ILVA, the Life Actuarial (A) Task Force would like commenters to consider the following questions:**

**AG ILVA Exposure Questions**

- 1. In addition to the Market Value Adjustment (MVA) approach outlined in the draft AG, should the AG allow companies to utilize MVA term lengths other than the maturity of the Fixed Income Asset Proxy? For example, Index Strategy Term or surrender charge period, etc.*
- 2. Should the AG allow companies to continue to have the option to include or exclude a MVA in their ILVA products?*

Draft: 11/15/22

Life Actuarial (A) Task Force  
Virtual Meeting  
October 6, 2022

The Life Actuarial (A) Task Force met Oct. 6, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil and Elaine Lam (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Amy L. Beard represented by Scott Shover (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Discussed Comments Received on the IUL Illustration (A) Subgroup Exposure

Andersen noted that a concept for indexed universal life (IUL) illustrations has been exposed since July and that related comments were discussed during the Summer National Meeting. He also noted that additional comments were received after the discussion at the Summer National Meeting. He said that after the discussion of the first set of comments, it appeared that there was an informal regulator consensus on a two-step solution: 1) a quick fix to address illustrations for uncapped volatility-controlled indices; and 2) request that the Life Insurance and Annuities (A) Committee pursue a targeted opening of the *Life Insurance Illustrations Model Regulation* (#582) to provide a long-term solution that would work for a wide variety of potential future product designs.

Andersen then provided a short explanation for each of the additional comment letters (Attachments Six-A). Birny Birnbaum (Center for Economic Justice—CEJ) noted that he supports the two-step approach, with the caveat that he does not want any arbitrary limitations on opening the model given his view that material changes would need to be made to improve illustrations. Andersen noted his intention to include a lengthy public comment period alongside the recommendation to the Life Insurance and Annuities (A) Committee. Yanacheak noted that he had supported a limited opening of Model #582 as too broad of a request to the Life Insurance and Annuities (A) Committee may get rejected. Serbinowski said that without opening the entirety of Model #582, he does not see how there would not be incentives for companies to design products that simply illustrated well rather than performed well. Andersen replied that it would be helpful to the Life Insurance and Annuities (A) Committee for the Task Force to provide some idea of the fixes that would be needed. Birnbaum noted that he would draft up a rationale for opening Model #582 to provide a starting point for the Life Insurance and Annuities (A) Committee.

Hemphill noted that the next steps could be for the Indexed Universal Life (IUL) Illustration (A) Subgroup to work on both the quick fix and the recommendation for the Life Insurance and Annuities (A) Committee to Model #582 and asked if there were any objections from Task Force members to that plan. There were no objections, and the discussion concluded with that direction.

2. Adopted APF 2022-06

Lam summarized amendment proposal form (APF) 2022-06 by stating that it adds a requirement to disclose information regarding the company's inflation assumption in principle-based reserving (PBR) actuarial reports. Lam noted that a similar requirement was in VM-31, PBR Actuarial Report Requirements for Business Subject to a

Principle-Based Valuation, but that it was mistakenly taken out. Brian Bayerle (American Council of Life Insurers—ACLI) noted he supports the adoption of APF 2022-06, especially considering the high level of inflation currently present.

Lam made a motion, seconded by Leung, to adopt APF 2022-06 (Attachment Six-B). The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/10 06/Oct 06 Minutes.docx



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September 6, 2022

Ms. Rachel Hemphill  
Acting Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners

Mr. Fred Andersen  
Chair, Indexed Universal Life (IUL) Illustration (A) Subgroup (“IUL Subgroup”)  
National Association of Insurance Commissioners

Re: The Life Actuarial Task Force IUL Exposure (August 15, 2022)

Dear Ms. Hemphill and Mr. Andersen,

The American Academy of Actuaries<sup>1</sup> Life Illustrations Work Group (the “Work Group”) is pleased to provide comments to the Life Actuarial (A) Task Force on the IUL Exposure from August 15, 2022.

The Work Group notes that the [letter dated July 26, 2022](#), to the IUL Subgroup addresses the options that the IUL Subgroup had previously exposed for comments and which are still applicable to this exposure. The Work Group is focusing this letter on the additional request to comment on the “limited, targeted revisions to the *Life Insurance Illustrations Model Regulation* (#582) that may help to reduce or eliminate the need for addressing future IUL illustration issues through an actuarial guideline.”

The Work Group believes it needs to have a better understanding of what limited, targeted revisions to Model #582 the IUL Subgroup is envisioning when asking for comments. Without understanding what the IUL Subgroup means by this, or how it plans to approach these revisions, the Work Group does not feel it can specifically address the request. However, we can offer the following conceptual general comments on revising Model #582:

- The Work Group believes any change to Model #582 should be principle-based and apply to all products within the scope of the Model. The Work Group is concerned that any changes that are targeted with only IUL in mind could result in unintended consequences for non-IUL products.

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

- The Work Group does not believe it is appropriate to explicitly address a product type within the Model #582.
- The Work Group also notes the extended time frame that will likely be required for any revision and state-by-state adoption of Model #582 compared to revising an actuarial guideline.

The Work Group appreciates the efforts of the Life Actuarial (A) Task Force and the IUL Subgroup to review Actuarial Guideline 49-A. If you have any questions or would like to discuss the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Alicia Carter, MAAA, FSA  
Chairperson, Life Illustrations Work Group  
American Academy of Actuaries



**Brian Bayerle**  
Senior Actuary

September 6, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup (Subgroup)

Re: Exposed IUL Questions

Dear Ms. Hemphill and Mr. Andersen:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the re-exposure of the IUL questions posed by the Subgroup.

ACLI recognizes that concerns have been raised by regulators and wishes to work with the Subgroup to develop solutions that appropriately address the underlying concerns.

Several regulators have expressed interest in pursuing a “quick fix” to AG 49-A to address concerns around the illustration of volatility-controlled indices. We would support an effort to discuss and address the specific regulatory concerns while maintaining the illustration of key features of the policies. Any such effort should impose changes on a prospective basis only because ACLI does not generally support retroactive application of new regulatory limitations.

With regard to the proposal “to address any broader issues with life illustrations,” ACLI believes that there should be a thorough analysis and evaluation process that is used to identify the underlying issues and drive the solutions, which may or may not include opening Model #582.

ACLI is appreciative of your consideration of our comments and looks forward to a future discussion.

A handwritten signature in black ink, appearing to read 'B Bayerle', is written in a cursive style.

cc: Scott O’Neal, NAIC

American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI’s member companies are dedicated to protecting consumers’ financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI’s 280 member companies represent 94 percent of industry assets in the United States.

[acll.com](http://acll.com)

September 3, 2022

To the Life Actuarial (A) Task Force

Re: IUL Illustration Subgroup Comments

Thank you for the opportunity to comment on the four potential options for handling the identified issue with Indexed Universal Life illustrations plus consideration of limited, targeted revisions to the Life Insurance Illustrations Model Regulation (#582).

The *Coalition of Concerned Insurance Professionals* is a group of independent insurance practitioners and professionals who have joined together because of our shared concern about the potential for misleading policy illustrations, especially regarding Indexed UL illustrations.

We believe that the current state of Indexed UL illustrations warrants a quick and comprehensive response, at a minimum, involving a combination of options A, C & D. As our letter pointed out in February 2022, Indexed UL illustrations using non-BIA strategies with fixed interest bonuses can generate illustrated income that is more than 60% higher than BIA strategies. This is, in our view, entirely inconsistent with the intent of regulators in crafting AG 49-A and has resulted in a continuation of gamesmanship and illustration warfare that circumvents regulatory intent. Our long-standing position remains unchanged: The hypothetical lookback methodology is at the root of the problem and must be addressed.

Furthermore, we believe that there is a need for changes to #582 after implementing an immediate corrective action to AG 49-A abuses. While we do not feel the need to be prescriptive at this stage in the process, we are in favor of modifications to #582 so that it can help level the playing field and bring Index UL – as well as other previously unaddressed issues such as no-lapse features and variable UL - into a consistent illustration framework that uniformly applies to all life insurance products.



Thank you again for the opportunity to comment and we look forward to working with the Subgroup to implement a durable solution for Indexed UL illustrations.

Coalition of Concerned Insurance Professionals  
Signed (alphabetically):

Ben Baldwin, Jr.

Bill Boersma, President, OC Consulting Group

Barry Flagg, President, Veralytic

Chris Hause, FSA, President, Hause Actuarial Solutions

Tom Love, Director of Insurance Analytics, LifeTrust3D™

Steven Roth, President, Wealth Management International, Inc, Licensed Life & Disability Insurance Analyst

Larry J. Rybka, Chairman & CEO, Valmark Financial Group

Bobby Samuelson, Executive Editor, The Life Product Review

Jerry Vanderzanden, Principal, WSLV, LLC; Insurance Fiduciary®

Richard M. Weber, President, The Ethical Edge, Inc; Insurance Fiduciary®

Scott Witt, FSA, President, Witt Actuarial Services

September 6, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup (Subgroup)

Via Email: soneal@naic.org

Re: IUL Re-Exposure

Dear Ms. Hemphill and Mr. Andersen:

The undersigned companies welcome the opportunity to comment on the Life Actuarial Task Force re-exposure of options regarding illustrations for indexed universal life insurance (IUL) policies.<sup>1</sup> We would like to acknowledge the efforts the IUL Illustration Subgroup and Life Actuarial Task Force have put forth to address illustrations of IUL products over the past several years, including the current effort regarding the Actuarial Guideline 49-A framework. We appreciate the opportunity to provide our comments on the questions and potential solutions that are under consideration.

Illustrations are meant to protect consumers and foster understanding of life insurance products and features. With this important purpose in mind, we offer recommendations for an interim fix impacting IUL illustrations and a long-term solution for life illustrations. As a first step in determining the scope and approach of a long-term solution to address illustrations, we recommend a thorough analysis be completed to identify the regulatory goals and the ideal end state. Such an analysis should follow a holistic and principles-based approach with a focus on consumer understanding of various product features. This analysis would inform whether changes to the Life Insurance Illustrations Model Regulation #582 (Model) are needed and the scope of necessary revisions. We believe that any changes to the Model should be focused on protecting consumers and accommodating evolving product designs in response to market interest while mitigating the possibility of frequent updates to the Model. Throughout the analysis, we would ask that regulators appropriately factor the importance of promoting consumer access and a regulatory framework that fosters a fair and competitive playing field across all types of life insurance, and unique features of indexed universal life, as consumers may be considering multiple product types.

In the interim, we recommend implementing a “quick fix” with a brief revision to Actuarial Guideline 49-A consistent with “Option A” in the American Academy of Actuaries’s February 2022 comment letter.<sup>2</sup> We support a limit on indexed illustrated rates of 145% of each indexed account’s hedge budget, similar to the 145% of net investment earned rate limitation on the Benchmark Index Account. A limited

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<sup>1</sup> The undersigned companies represent approximately 50% of the IUL insurance sales in 2021 based on premium

<sup>2</sup> American Academy of Actuaries, Comments on IUL Exposure from the December 8, 2021 LATF Session, (February 3, 2022)

revision, to be applied on a prospective basis, to section 4C of AG49A would accomplish this change as specified in the appendix. While this approach could still result in some index accounts illustrating slightly higher than the Benchmark Index Account, it would quickly lower the illustrated values of volatility controlled indices and allow regulators and interested parties to begin a thorough analysis to determine the scope, approach, and implementation of a long-term solution.

Thank you for the consideration of these comments. We would be glad to respond to any questions you may have regarding this letter.

Allianz  
John Hancock  
Lincoln National  
National Life Group  
Pacific Life  
Sammons Financial Companies

#### **Appendix – Revised AG49A Language**

4. C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i), (ii) and (iii):

i. The Annual Rate of Indexed Credits for the Benchmark Index Account calculated in 4 (B) plus the Supplemental Hedge Budget for the Index Account.

ii. The Annual Rate of Indexed Credits reflecting the fundamental characteristics of the Index Account and the appropriate relationship to the expected risk and return of the Benchmark Index Account. The illustration actuary shall use actuarial judgment to determine this value using lookback methodology consistent with 4 (A) and 4 (B) (i) where appropriate.

iii. 145% of the Hedge Budget for the Index Account.

Fred,

We appreciate the opportunity to present solutions to the current identified issue with Indexed Universal Life illustrations. In light of the discussion at the recent NAIC meeting and the prospect of a regulatory inquiry into a modification of the Illustration Model Regulation (#582) specifically to address consumer-friendly ways to illustrate Indexed UL, it seems to us that the Subgroup has two potential paths for a solution to the current issue:

**Path 1 – Maintain the Lookback**

Maintaining the lookback would allow Indexed UL to continue to illustrate in a way that is **inconsistent** with other fixed insurance products while the broader of issue of modifications to #582 is undertaken by regulators, a process that may take several years.

A solution that maintains the lookback methodology would define and extend the illustrated “option profit” in the BIA account to the non-BIA accounts, as has been proposed by other parties. In our view, pursuing this path could potentially require substantial revisions to AG 49-A in order to ensure that it is airtight.

**Path 2 – Remove the Lookback**

Removing the lookback would make Indexed UL illustrate in a way that is **consistent** with other fixed insurance products while broader changes to #582 are explored. There are at least three solutions that do not incorporate the lookback:

1. Use the Hedge Budget, which is already an element of AG 49-A, for each indexed account.
2. Use a Black-Scholes fair-market value of the currently offered index participation in each indexed account.
3. Use the offered Fixed Account rate as the maximum illustrated rate for all indexed accounts.

Each of these solutions has merits and potential implementation challenges, but all are fundamentally straightforward, consumer-friendly and more consistent with other NAIC frameworks. In our view, removing the lookback would actually be an easier and quicker approach than maintaining it with new restrictions, as in Path 1.

**Recommended Approach**

Our view is that regulators would be well served to provide clarity on whether the lookback should be maintained or removed before asking for details regarding specific solutions. It is the necessary first step.

Our concern with maintaining the lookback that there may be other loopholes not contemplated by these changes. The lookback has been the root cause of all previous regulatory inquiries and will likely continue to be a cause for future inquiries if maintained.

Furthermore, we do not believe that there is any reason – beyond continuity with previous guidelines – to maintain the lookback. It is not necessary to use the lookback to explain how Indexed UL works. Instead, our experience is that the lookback *distracts* from the mechanics of the product by creating the perception of illustrated values as a performance projection, which is not the intended use for illustrations.

As a result, we recommend that regulators pursue solutions that do not incorporate the lookback, all of which have merit and should be discussed amongst regulators, industry and interested parties to find the most workable and consumer-friendly solution. We look forward to being a part of that process.

**Bobby Samuelson**  
Executive Editor  
The Life Product Review

**Sheryl J. Moore**  
President & CEO  
Moore Market Intelligence

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September 6, 2022  
Mr. Fred Andersen  
Chair, NAIC Indexed Universal Life (IUL) Illustration (A) Subgroup (IUL Subgroup)

Dear Fred,  
Securian Financial respectfully submits these comments in response to the NAIC IUL Illustrations (A) Subcommittee request for comments on AG49-A.

Securian Financial believes that a quick fix for the currently identified issue is obtainable. There are several straightforward ways to change AG49-A to make it clearer/better enforce that the BIA guardrails apply to all illustrated indexes.

We understand that there is an ask to consider opening, all or part of Model #582. We believe we need to better understand what LATF is hoping to accomplish by opening the model regulation before we can fully comment. The model regulation applies to several types of products thus adding IUL specific language to the regulation could have unintended consequences that need to be thoroughly thought-out and vetted. If LATF determines that they want to move forward with defining the scope for changes to model #582, Securian Financial is ready to participate with our industry peers in defining that scope.

We resubmit the language below to be added to AG49-A for consideration as a “quick fix”.

**Recommended Changes**

We would like to recommend changes to AG49-A 4C by adding condition (iii) to limit the maximum amount of leverage illustrated to that of the BIA:

C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i), (ii) and (iii):

- i. The Annual Rate of Indexed Credits for the Benchmark Index Account calculated in 4 (B) plus the Supplemental Hedge Budget for the Index Account.
- ii. The Annual Rate of Indexed Credits reflecting the fundamental characteristics of the Index Account and the appropriate relationship to the expected risk and return of the Benchmark Index Account. The illustration actuary shall use actuarial judgment to determine this value using lookback methodology consistent with 4 (A) and 4 (B) (i) where appropriate.
- iii. The lesser of (a) and (b) multiplied by the Annual Rate of Index Credits for the Benchmark Index Account, calculated in 4B, divided by (b); plus, the supplemental hedge budget:
  - a) The Hedge Budget of the Indexed Account
  - b) Hedge Budget of the Benchmark Indexed Account.

Respectfully,  
Seth Detert, Securian Financial

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September 6, 2022

Ms. Jennifer Frasier, Life Actuary  
National Association Insurance Commissioners  
IUL Illustration (A) Subgroup  
1100 Walnut St., Ste. 1500  
Kansas City, MO 64106

**Via Email @ [jfrasier@naic.org](mailto:jfrasier@naic.org) and Via Overnight Delivery**

Ms. Frasier and Members of the Committee:

I have lent my signature to a letter urging NAIC to reform illustrations for Index Universal life and specifically for what IUL promoters would call “proprietary indexes” or the committee refers to them as volatility-controlled funds. This letter was part of a coalition that has consistently warned of and seen danger to consumers from abusive IUL illustrations. I submitted a more detailed to the committee on this topic dated January 31, 2022 that specifically presented both evidence of abuse and the harm caused to consumers. The NAIC must act firmly and quickly to end this abuse.

The entire concept of keeping Index products as a state regulated insurance product as opposed to Federal Securities regulation is that consumers are not subject to the risk of loss to the extent that they could be with securities purchases. In my experience the abuse of IUL products, especially when financed, presents greater risk to consumers than anything I have seen in my 36 years in the business. I am CEO and Chairman of the Valmark Financial Group and in addition to placing over sixty billion dollars of life insurance over the years, we conduct business through a FIRNA regulated broker dealer and an SEC registered investment advisor with seven billion dollars of assets managed.

*As currently regulated Premium Financed IUL transactions leveraged with external bank financing provide greater risk to consumers than anything we sell as a broker dealer or our investment advisor.* In reviewing sales materials from over one hundred proposed transactions and more than dozen cases being litigated, we see very few where the extent of the risk is presented let alone understood by the consumer. Reviewing actual harm to some consumers who implemented these plans, I think them analogous to Warren Buffett’s warning on hedge funds, these are financial weapons of mass destruction. Unlike other illustration problems in the past, the damage is not limited to insurance that costs more, but risk that it wipes out substantial proportions of client’s net worth.

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Ms. Jennifer Frasier, Life Actuary  
September 6, 2022  
Page 2

In some of these cases I have reviewed consumers have taken out loans to buy policies that are 15 to 20 times their annual income and well more than their entire net worth and borrow the money from a commercial bank!

With standard caps on the S&P 500 dropping, new proposals for premium financing are exclusively based on Proprietary indexes. Both the games that can be played with bonuses and multipliers in these illustrations and the impression that consumers are given with back-tested models make them prime for abuse. In the presentations using these Proprietary indexes, the consumer is left with a very clear impression from the marketers of these programs that what they are being shown in the maximum AG-49A rate is conservative and that illustration is a base line for expected returns. In what has become a cat and mouse game of regulators with AG-49, and AG-49-A, there is a need for a comprehensive fix. The only one of the proposed solutions being considered that makes sense is limiting IUL illustrations to use the same rate that is used for the fixed account. The initial foundation of a 45% options profit for IUL illustrations was fundamentally flawed and cannot be remedied with small tweaks.

Unfortunately, the disappointment IUL policyholders are experiencing is not new to the life business. As bond and crediting rates have dropped over the last 30 years all general account products have seen declines in credited rates and results that are less than what was expected. I concur with my colleagues that a broader fix is needed. I would support targeted revisions to the Life Insurance Illustrations Model Regulation (#582) but not in place of correcting IUL first.

Our industry has a proud history of helping families to reduce and eliminate the risk of dying too soon, living too long, or becoming disabled. Properly used, life insurance products are one of the most important risk management tools we can offer consumers. This socially beneficial use of products is a foundation for the tax benefits we receive for our products under the U.S. tax code. IUL, and specifically the abuse of proprietary indexes, when leveraged with bank debt does the exact opposite. It has allowed a small number of unethical marketers to create a gamble of a consumer's net worth with "loaded dice" that is not a risk migration device but a risk multiplier. I ask the committee to act decisively and promptly to finally fix this embarrassment to the industry.

Sincerely,



Lawrence J. Rybka, JD, CFP®  
Chairman, CEO

LJR/mkr



<u>Dates: Received</u>	<u>Reviewed by Staff</u>	<u>Distributed</u>	<u>Considered</u>
5/12/22	RM		
<u>Notes:</u> APF 2022-06			

**Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force  
 Amendment Proposal Form**

1. Identify yourself, your affiliation and a very brief description (title) of the issue.  
  
 Staff of Office of Principle-Based Reserving, California Department of Insurance – VM-31 reporting of inflation assumption.
  
2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:  
  
 Valuation Manual (January 1, 2022 edition), with NAIC Adoptions through August 17, 2021: VM-31 Section 3.D.5
  
3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)  
  
 Please see Appendix attached.
  
4. State the reason for the proposed amendment? (You may do this through an attachment.)  
  
 Please see attached Appendix.

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## Appendix

### *ISSUE:*

VM-31 contains no specific mention of a requirement to disclose the inflation assumption for Life PBR.

### *SECTIONS:*

VM-31 Section 3.D.5.f

### *REDLINE:*

(new)

f. Inflation – Assumed rate(s) of inflation and the underlying rationale/derivation, including any consideration given to making distinctions between short term and long term inflation rates.

### *REASONING:*

1. Restore mention of inflation rate assumption to VM-31 that had originally been there.
2. Have more consistency between Life and VA. The VA part of VM-31 does mention inflation.
3. Recognize that the recent uptick in the inflation rate may drive a desire/need for duration-specific inflation rates in PBR models.
4. Although VM-31 Section 3.D.1.a does refer to a website containing an optional template that includes mention of inflation, this falls short of mandating that inflation be covered in the company's VM-31 report.

Draft: 11/1/22

Life Actuarial (A) Task Force  
Virtual Meeting  
September 29, 2022

The Life Actuarial (A) Task Force met Sept. 29, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ahmad Kamil (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Nicole Boyd (KS); Chlora Lindley-Myers represented by William Leung (MO); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Heard Guidance on the Implementation of Future Mortality Improvement in VM-20

Hemphill noted that the implementation of the future mortality improvement (FMI) rates adopted during the Sept. 22 meeting of the Life Actuarial (A) Task Force could increase or decrease a company's reserve results depending on company or block of business-specific factors. She said that companies that are not ready to apply the FMI rates in their year-end 2022 valuations could use a simplification according to the standards of Section 2.G of VM-20, Requirements for Principle-Based Reserves for Life Products, if the company is able to demonstrate that this simplification does not materially understate reserves or bias the reserves lower.

2. Heard an Update on the NAIC's ESG Field Test

Scott O'Neal (NAIC) said that while the NAIC Economic Scenario Generator (ESG) Field Test company data submissions were originally due at the end of August, several companies have requested extensions and have not yet turned in data. He said that some companies have dropped out of the field test since an update was last provided at the Summer National Meeting and that 26 different insurance groups comprising 39 legal entities are currently still participants. O'Neal noted that of those 39 legal entities, 35 have turned in at least some of their field test results, and 27 have notified the NAIC that their submission is complete. He said that the NAIC continues to work with the field test participants to ensure that nothing is missing from their submissions and to verify results.

Eom asked when state insurance regulators and interested parties could expect to see a summary of the results of the field test. O'Neal noted that the timing is unclear given that some companies have yet to turn in results and that there was expected to be a good amount of dialogue between the NAIC and companies needed to confirm field test results.

3. Heard an Update from the Academy on Equity Model Stylized Facts

Jason Kehrberg (American Academy of Actuaries—Academy) walked through changes that had been made to the Academy's equity model stylized facts (Attachment Seven-A) following state insurance regulator feedback. He said that changes were made to stylized facts #2 and #5 and that a new stylized fact #9 was added to the set.

Hemphill asked whether the stylized facts were prioritized by number. Kehrberg noted that a rough prioritization was performed based on the intended use for statutory reserves and capital, but he said the group would revisit this question as it develops acceptance criteria.

#### 4. Requested Volunteers for New ESG Drafting Groups

Hemphill said the new drafting groups would be formed to support the NAIC's implementation of a new ESG for statutory reserves and capital. She went over the directives of each new drafting group (Attachment Seven-B), including: 1) recommending updates or replacements for the VM-20 stochastic exclusion ratio test (SERT) scenario methodology; deterministic reserve scenario; scenario picker tool; VM-21, Requirements for Principle-Based Reserves for Variable Annuities, Alternative Methodology; and the VM-21 Company Specific Market Paths (CSMP) methodology; and 2) determining an appropriate model governance framework. She requested that state insurance regulators and interested parties interested in volunteering for these drafting groups email O'Neal.

#### 5. Heard an Update on APF 2022-04 and the NAIC's Transition to SOFR for Swap Spread Assumptions

Alan Routhenstein (Academy) walked through a comment letter (Attachment Seven-C) on amendment proposal form (APF) 2022-04 related to the VM-20 and VM-21 prescribed swap spread assumptions. He noted that the Academy had received an informal request from NAIC staff for transition guidance with regards to moving from the London Interbank Offered Rate (LIBOR) to the Secured Overnight Financing Rate (SOFR) as the basis for the swap spread assumption. The letter addressed three recommendations: 1) the timing of the transition from using LIBOR to SOFR in the determination of prescribed swap spread assumptions is expected to be for year-end 2022; 2) companies should assess whether the prescribed current and long-term swap spreads are materially appropriate for their valuations before SOFR is implemented by the NAIC and make adjustments if necessary; and 3) if SOFR is not implemented for use in prescribed swap spread assumptions by year-end 2022, then companies should continue assessing the reasonableness of the prescribed assumptions for their year-end 2022 valuations.

Tsang asked how companies should determine the definition of "materially appropriate." Routhenstein responded that the recommendation is for the actuary to make a judgment to determine what is materially appropriate. Tsang noted that he hopes the Academy could provide a more definitive threshold for determining materiality and that he would like to see demonstrations of materiality from the company actuaries and not just rely on judgment without support. Connie Tang (Prudential) noted that current language in VM-31, PBR Actuarial Report Requirements for Business Subject to a Principle-Based Valuation, regarding modeling simplifications could apply in this situation and require disclosures for any simplifications. Hemphill added that current guidance in VM-20 included a materiality standard that could be used by companies to determine if the swap spread assumption was material to their block of business. Hemphill and Tsang noted a desire to see more clarity related to disclosures and materiality in the next version of the Academy's transition guidance.

Pat Allison (NAIC) gave an update on the status of the data contracts that the NAIC is working to put into place to transition to SOFR. Allison noted that the NAIC is not currently in a position to be able to provide SOFR-based prescribed swap spreads. She said that the challenge is that although the swap spread data received from the two sources is similar, the Treasury rates for some tenors between the two sources are different. She noted that the NAIC has asked the Academy for a recommendation on an appropriate methodology to determine the full Treasury yield curve for purposes of developing the swap spread assumptions.

Having no further business, the Life Actuarial (A) Task Force adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/09 29/Sep 29 Minutes.docx

# Economic Scenario Generator (ESG) Stylized Facts for Equities

Economic Scenario Generator Work Group (ESGWG)



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National Association of Insurance Commissioners (NAIC) Life Actuarial (A) Task Force (LATF)  
September 29, 2022

## Regulators provided feedback on the ESGWG's 8/9/22 presentation to LATF

2

- The Academy would like to thank regulators for providing feedback on this important topic.
- Edits were suggested for stylized facts #2 and #5.
  - The ESGWG agreed with the suggested edits (reflected in red in a following slide).
- A new stylized fact was suggested to address the increased correlation between equity indices frequently seen in bear markets.
  - The ESGWG agreed and added a new stylized fact #9 to this effect (in red).
- There was feedback stating the usefulness of including a slide with the “goals related to equity scenarios” that Conning and the NAIC presented to LATF on 12/17/20.
  - The ESGWG agreed and added such a slide directly after the revised stylized facts that follow.

2

## Regulators provided feedback on the ESGWG's 8/9/22 presentation to LATF

3

- There were questions on stylized facts #2 and #4 (positive equity risk premium, and impact of initial market conditions).
  - Regulators noted that at this point stylized facts (and acceptance criteria) should be able to be consistent with different ERP theories, including theories based on a constant mean equity risk premium above interest rates and theories based on a constant mean equity return (i.e., one that exceeds the mean reversion point for interest rates).
  - The field test included scenario sets modeled under both of the above approaches.
  - LATF has indicated a desire to hold off on hearing additional content and having additional discussion on these stylized facts until field test results are available.

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## Stylized facts for equities

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1. Equity indices (indeed, all asset classes) tend to exhibit **consistent risk/reward relationships** over **long** time horizons.
2. Cumulative equity returns tend to exceed the compounded risk-free rate (positive **observed equity risk premium**) over long time horizons, but over short time horizons the **observed** equity risk premium fluctuates due to several factors and can be negative.
3. Equities **fluctuate between bull and bear markets** (bubbles tend to burst)—markets can experience significant losses but eventually tend to **move back into positive territory** (negative cumulative equity returns become less likely over longer time horizons).
4. Cumulative equity returns **over long time horizons are not materially impacted by initial market conditions**.
5. The **volatility of equity returns varies over time but has a strong tendency to quickly reverts to normative levels**. This allows for both extreme gains and extreme losses over short time periods (i.e., the distribution has fat tails, or **positive kurtosis**). Furthermore, the **volatility of equity returns is higher in bear markets**. This increases the probability of extreme losses relative to extreme gains (i.e., the distribution has a longer left tail, or **negative skewness**).

4

# Stylized facts for equities (continued)

5

6. Equity markets contain **pathwise dynamics** over long time horizons that aren't present in the distribution of single-period returns. Future equity scenarios should have reasonable distributions of cumulative equity returns over long time horizons (e.g., 10, 20, 30 years), especially since these distributions are key to the performance of long-duration life and annuity products.
7. Future equity scenarios should include events that are **plausibly more extreme than history**.
8. Equity returns have both a **price and dividend component**, and they behave differently—dividend returns tend to be more stable than price returns.
9. Returns between different equity indices **are generally positively correlated** over long time horizons. This correlation may increase sharply in bear markets, but it tends to revert to normative levels in a short period of time.

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## Goals related to equity scenarios from Conning/NAIC 12/17/20 presentation to LATF

### Goals relating to equity and bond fund scenarios:

1. Returns should be provided for funds representative of those offered in U.S. insurance products.
2. The ESG should be calibrated using an appropriate historical period.

### Goals relating to the equity scenarios:

3. The equity model should have stochastic volatility and the initial volatility should be updated frequently.
4. The ESG should have the ability to generate very large losses and gains in short periods of time (i.e., jumps).
5. Equity scenarios need to reflect the possibility of a very long recovery after a period of losses.
6. There should be higher correlation in the tail scenarios between different equity indices.
7. There should be a link between equity returns and Treasury yields.

- These goals are generally consistent with the stylized facts presented on the prior two slides.
- Note that stylized facts are generally *prioritized* based on the intended application, but the stylized facts themselves are generally independent of the intended application (largely based on historical data, sometimes supplemented with forward looking views).
- Note that stylized facts and their prioritization are generally independent of the model since models differ in their ability to reflect the various market properties described by stylized facts.

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Source: Conning/NAIC 12/17/20 presentation to LATF

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# Thank You

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- Contact: Amanda Barry-Moilanen,  
Life Policy Analyst: [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org)

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## **NAIC ESG Drafting Group Directives**

**VM-20 ESG Technical DG:** Recommend updates or replacements as needed for the DR, SERT, and scenario picker tool that are consistent with the broader ESG updates.

**VM-21 ESG Technical DG:** Recommend updates or replacements as needed for the Alternative Methodology and CSMP that are consistent with the broader ESG updates.

**ESG Governance DG:** Recommend an ESG governance framework (frequency, metrics, disclosures, and other specifics for ongoing monitoring as well as a related framework for determination, evaluation, and documentation of updates) consistent with model governance best practices. Consider how ASOP 56, Model Governance Checklist, and Model Governance Practice Notes specifically apply to the ESG maintenance and update process.





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September 29, 2022

Ms. Rachel Hemphill  
Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners (NAIC)

Re: Academy transition guidance for APF 2022-04 on swap spreads and LIBOR transition to SOFR (the “APF”), and for the anticipated next version of a related memo (the “Memo”) from NAIC staff.

Dear Ms. Hemphill,

The Life Reserves Work Group, Annuity Reserves and Capital Work Group, and Variable Annuity Reserves and Capital Work Group of the American Academy of Actuaries<sup>1</sup> (the “Academy”) appreciates the opportunity to provide comments on this topic. The Academy is thankful to LATF and NAIC staff as well for the July 30 LATF adoption of the APF, June 9 and May 26 exposures of earlier versions of the APF and of the Memo, for the March 10 exposure of an even earlier version of the APF drafted by the Academy and an accompanying Academy presentation deck, and for considering Academy member views expressed in our July 21 and June 7 comment letters and in May through an informal drafting group discussion and follow-up emails.

The Academy has received an informal request from NAIC staff for transition guidance with regards to the APF and the Memo.

**On timing for the effective date of the next version of the Memo:**

The Academy recommends that LATF not attempt to adopt a next version of the memo for September 30, as there are data discrepancies and other technical issues that need to be resolved

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

and there is not adequate time remaining for an exposure period. Instead, the Academy recommends that LATF plan for an effective date of December 31.

### **On transition guidance for valuation as of September 30:**

On May 23, an NAIC e-mail to LATF Members, Interested Parties, and Interested Regulators stated the following:

The Valuation Manual prescribes swap spreads to be used in calculating reserves under VM-20 and VM-21. These are shown in 2022 Table J Current and Long-Term Swap Spreads. The VM-20 prescribed swap spreads have been calculated using the average of LIBOR swap spreads from two third-party sources. The NAIC recently discovered that beginning December 31, 2021, one of the two sources began providing SOFR swap spreads instead of LIBOR swap spreads. Consequently, the rates published for 12/31/21 and subsequent months have been a 50/50 blend of LIBOR and SOFR. The exceptions are the swap spreads for the 3-month and 6-month tenors which continue to be based fully on LIBOR.

[The NAIC is working toward discussions with both sources to ascertain their ability and desire to provide both LIBOR and SOFR through June 30, 2023, the date on which the publication of LIBOR rates is scheduled to cease.]

Given that the above data discrepancies were persisting as of August 31, and given language in VM-20 Section 7.F.8.d that notes that the prescribed spreads should be used “wherever appropriate,” the Academy recommends that as of the September 30 valuation date, each company should assess whether the prescribed current benchmark swap spreads and prescribed current long-term swap spreads are appropriate for the company’s calculations as of the valuation date. Such assessment should reflect the materiality of the estimated impact of the data discrepancies on the company’s capital and surplus, its capital ratios, or any applicable hedging programs, reinsurance programs, or other capital management programs. If the prescribed swap spreads are materially inappropriate for the company as of the valuation date, the company should utilize non-NAIC data sources and reasonable estimates (including estimates to approximate the “85% conditional mean” methodology applicable for long-term benchmark swap spreads as described in VM-20 Section 7.G.3), which the company documents in an adequate manner, of

- current benchmark LIBOR swap spreads and/or current benchmark SOFR swap spreads, as appropriate; and
- long-term benchmark LIBOR swap spreads and/or long-term benchmark SOFR swap spreads, as appropriate.

This Academy recommendation would also apply for the valuation as of December 31, 2022, if LATF does not adopt a next version of the Memo, effective on or before December 31, 2022.

**On transition guidance for the next version of the Memo and to implement APF 2022-04:**

The Academy is currently deliberating on this topic. After the completion of our deliberations, the Academy is planning to prepare and submit to LATF in October or November another recommendation letter with transition guidance for the next version of the Memo and to implement APF 2022-04.

~ ~ ~

The Academy appreciates the efforts of LATF and NAIC staff on the APF and Memo. If you have any questions or would like further dialogue on the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Alan Routhenstein, MAAA, FSA  
Member, Life Valuation Committee  
American Academy of Actuaries

Draft: 10/19/22

Life Actuarial (A) Task Force  
Virtual Meeting  
September 22, 2022

The Life Actuarial (A) Task Force met Sept. 22, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Mark Fowler represented by Jennifer Li (AL); Ricardo Lara represented by Ahmad Kamil, Thomas Reedy, and Ted Chang (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Adopted the SOA HMI and FMI Factors

Marianne Purushotham (Society of Actuaries—SOA) presented the SOA Historical Mortality Improvement (HMI) and Future Mortality Improvement (FMI) recommendation (Attachment Eight-A) along with the HMI and FMI Rates (Attachment Eight-B). The SOA recommended: 1) an HMI approach that is based on data from 2010–2020 but sets the 2020 mortality equal to the 2019 level to remove the impact of COVID-19; and 2) an FMI approach that includes mortality deterioration in the initial years of the scale to account for the impact of COVID-19 on mortality and then grades to long-term mortality improvement (MI) levels at projection year 10. Mr. Slutsker asked about how the margins were applied to the FMI. Ms. Purushotham explained that the margin is applied before the application of smoothing between the attained age rates. Brian Bayerle (American Council of Life Insurers – ACLI) noted the ACLI’s support of the recommendation and that a large insurance carrier had noted that their results were consistent with those produced by the NAIC model office.

Mr. Yanacheak made a motion, seconded by Mr. Leung, to adopt the SOA’s HMI recommendation. The motion passed unanimously.

Mr. Carmello noted that a rate of zero was appropriate for FMI given the impacts of COVID-19 and other factors, including individuals forgoing medical care during the COVID-19 pandemic. Mr. Reedy supported the suggestion for zero FMI and noted that in a principle-based reserving (PBR) framework, greater uncertainty calls for greater margin. Mr. Yanacheak said that the SOA’s recommendation was reasonable given the reflection of COVID-19 in the FMI and noted that this assumption is revisited on an annual basis. Mr. Chupp supported the SOA’s recommendation given the inclusion of deterioration in FMI to reflect COVID-19. Ms. Eom said that the margins included in the FMI are sufficient to reflect some uncertainty regarding the assumption.

Mr. Chupp made a motion, seconded by Ms. Eom, to adopt the SOA’s FMI recommendation. New York opposed, but the motion passed.

Ms. Hemphill noted that in reports for VM-31, PBR Actuarial Report Requirements for Business Subject to a Principle-Based Valuation, there are areas where companies can disclose the impact of implicit margins. She said that the more information that companies can include in their VM-31 reports on the impacts of the HMI and FMI

rates, the better-informed state insurance regulators can be going into the discussions for next year's HMI and FMI assumption discussions.

2. Heard an Update on the Health Actuarial (B) Task Force's Meeting to Consider Adoption of the GLWPVT Valuation Tables

Scott O'Neal (NAIC) noted that the Health Actuarial (B) Task Force is considering the adoption of a replacement for the 2005 Group Term Life Waiver Mortality and Recovery Table (GLWPVT) used in *Actuarial Guideline XLIV—Group Term Life Waiver of Premium Disabled Life Reserves (AG 44)* during its Sept. 28 meeting. He said that given the replacement table's mortality component, Life Actuarial (A) Task Force members may wish to participate in the meeting.

Having no further business, the Life Actuarial (A) Task Force adjourned.

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# Future Mortality Improvement Scale Development (VM-20) 2022 HMI and FMI Recommendations

SOA  
Research  
INSTITUTE



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Academy Mortality Improvements Life Work Group (MILWG);  
SOA Mortality and Longevity Oversight Advisory Council (MLOAC)

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Life Actuarial Task Force (LATF) Meeting—September 22, 2022

## Agenda

- Description of different historical mortality improvement (HMI) and future mortality improvement (FMI) approaches considered for 2022
- Recommendation for 2022
- Reserve impact analysis for the HMI/FMI approaches exposed
- Next steps

SOA  
Research  
INSTITUTE

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# HMI 2022 Scale: Considered Approaches

1. Remove shock impact of COVID-19 from historical average
  - Approach 1: Remove 2020 from the data in determining the 10-year historical average; use average from 2009-2019
  - Approach 2: Use average from 2010-2020 but include 2020 mortality = 2019 mortality—results in less mortality improvement in general than Approach 1
2. Include full COVID-19 shock in historical average
  - Approach 3: Include 2020 data in 10-year historical average

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# FMI 2022 Scale: Considered Approaches

## Approach 1:

- Basic scale
  - Grade from HMI 2022 MI level to long-term (LT) MI level based on Social Security Administration (SSA) Intermediate Projection at year 10 (2022–2032)
- Loaded scale (prudent estimate)
  - Basic Scale plus 25% general margin for uncertainty in trend\*

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\*Reduce improvement by 25% or increase deterioration by 25%



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# FMI 2022 Scale: Considered Approaches

## Approach 2:

- ❑ Basic scale : include COVID-19 impact (deterioration in mortality) in early years of the FMI scale
  - Assume deterioration for 2023 and 2024 followed by zero improvement in 2025.
  - Then grade to long-term (LT) MI level based on Social Security Administration Intermediate Projection at year 10 (grade from 2025–2032).
- ❑ Loaded scale (prudent estimate) = scale Basic scale plus 25% general margin for uncertainty in trend\*
- ❑ Approach 3:

Use Approach 2 but assume 50% greater deterioration for 2023 and 2024 than Approach 2 followed by zero improvement in 2025.

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\*Reduce improvement by 25% or increase deterioration by 25%



# Recommendation for 2022 HMI and FMI

## HMI Approach 2:

Use average from 2010–2020 but include 2020 mortality = 2019 mortality

- Assumes zero improvement for 2020
- Results in less mortality improvement in general than HMI Approach 1

## FMI Approach 2:

Basic scale : include COVID-19 impact (deterioration in mortality) in early years of the FMI scale

- Assume deterioration for 2023 and 2024 followed by zero improvement in 2025.
- Then grade to long-term (LT) MI level based on Social Security Administration (SSA) Intermediate projection at year 10 (grade from 2025–2032).

Loaded scale (prudent estimate) = scale above plus 25% general margin for uncertainty in trend

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# Issues Raised

- SSA Alt 2 reasonable basis for long-term rate
  - ▣ Primary criticism of SSA’s intermediate projection has been concern that MI implied rates are too low
- Appropriateness of inclusion of COVID-19 impacts in FMI
  - ▣ Industry mortality group principle states that shock impact of COVID-19 or other short term mortality event should only be included in the future mortality expectations to the extent they are expected to continue
  - ▣ FMI deterioration in first 3 years of reserve projection estimates expected future impact of COVID-19

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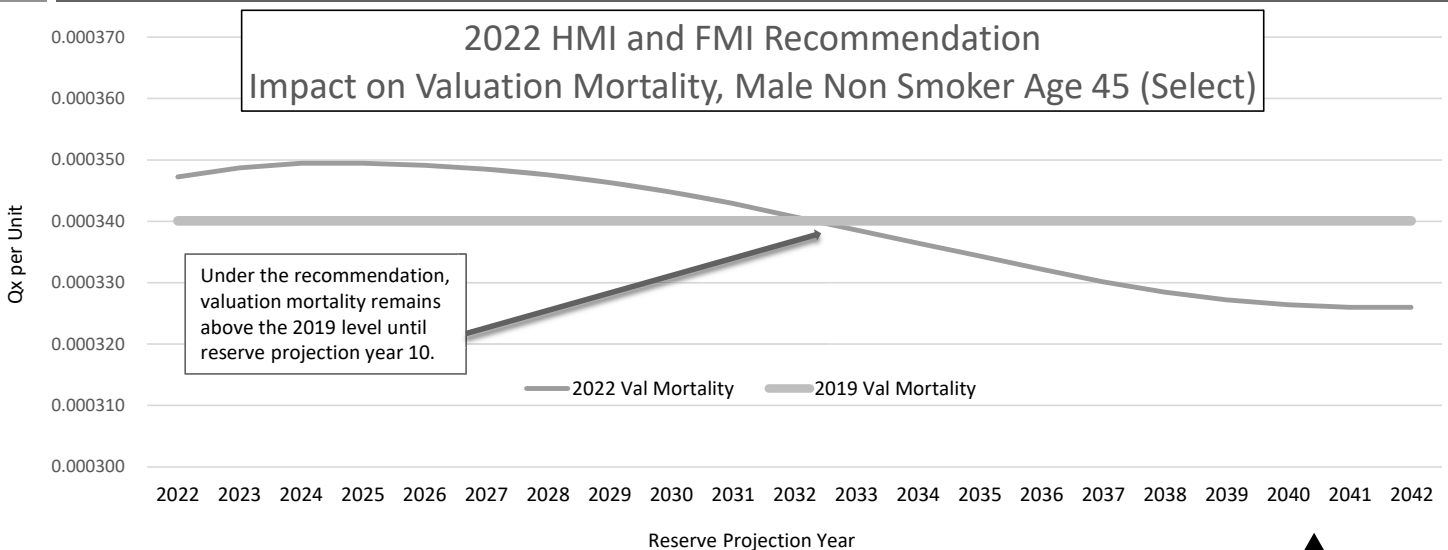


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# Impact on Valuation Mortality



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# HMI/FMI Approaches Exposed Per 8/25/2022 LATF Meeting

## Approaches included in NAIC exposure

1. HMI 2 with FMI 2—recommendation
2. HMI 2 with FMI 3
3. HMI 1 with no FMI (eliminated—less conservative than 4.)
4. HMI 2 with no FMI

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## Reserve Impact—NAIC Model Office

- Universal Life with Secondary Guarantees (ULSG) model—long-duration product, larger potential for reserve reduction
  - Model office and assumptions same as used in the yearly renewable term (YRT) representative model analysis
  - Lifetime shadow account secondary guarantee
  - No reinsurance in the model

Component	Values
Issue ages	Decennial issue ages 30 – 70
Gender	Male Female
Risk classes	Preferred non-tobacco Standard non-tobacco Standard tobacco
Face bands	Low (\$250,000) High (\$1,000,000)

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# Reserve Impact—NAIC Model Office

- Term Life Insurance Product with 10- and 20-year level premium periods
  - Model office and assumptions same as used in the YRT representative model analysis
  - Mature at age 95
  - 100% shock lapse at end of level term period

Component	Values
Issue ages	Decennial issue ages 20 – 60
Gender	Male Female
Risk classes	Preferred non-tobacco Standard non-tobacco Standard tobacco
Face bands	Low (\$250,000) High (\$1,000,000)
Term lengths	10 year 20 year

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## Reserve Impact Results—ULSG

Mortality Improvement Basis	ULSG		Approaches to HMI and FMI
	Normalized VM-20 Deterministic Reserve (DR)	Percentage Change from Baseline	
<b>Baseline:</b> HMI: no change to HMI FMI: zero FMI	\$ 1,000,000.00	----	<b>HMI</b> Approach 1 = historical average 2009-2019 Approach 2 = historical average 2010-2020 (zero MI in 2020)
HMI: Approach 2 FMI: Zero FMI	\$ 1,014,962.02	1.50%	<b>FMI</b> - grades to SSA intermediate projection long-term rate over 10 years
<b>RECOMMENDATION:</b> HMI: Approach 2 FMI: Approach 2	\$ 940,464.62	-5.95%	Approach 1 = no FMI deterioration for COVID-19 Approach 2 = apply deterioration due to COVID for first 3 years
Sensitivity: HMI: Approach 2 FMI: Approach 3	\$ 938,346.28*	-6.17%*	Approach 3 = apply greater 50 percent greater deterioration due to COVID-19 for first 3 years (sensitivity)

\*The slight decrease in reserves for the sensitivity run compared to the recommendation seems counterintuitive given the higher initial mortality deterioration present in the sensitivity. However, specific impacts related to the net-amount-at-risk pattern (decreasing in the initial years due to fund value growth before growing in later years as fund value runs out and the secondary guarantee comes into effect) meant that the shift of death claims to earlier years from later years for the sensitivity run resulted in a slightly reduced deterministic reserve compared to the recommendation. Overall, the conclusion is that the additional margin did not have a material impact on the deterministic reserve calculation for this model office product.

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# Reserve Impact Results—Term

Mortality Improvement Basis	Term	
	VM-20 DR	Reserve Change
<b>Baseline:</b>		
HMI: no change to HMI FMI: zero FMI	\$ (79,846)	----
HMI: Approach 2 FMI: Zero FMI	\$ (50,285)	\$ 29,561
<b>RECOMMENDATION:</b>		
HMI: Approach 2 FMI: Approach 2	\$ (68,968)	\$ 10,878
Sensitivity:		
HMI: Approach 2 FMI: Approach 3	\$ (66,303)	\$ 13,543

**Approaches to HMI and FMI**

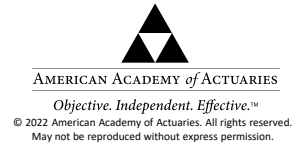
**HMI**  
**Approach 1** = historical average 2009-2019  
**Approach 2** = historical average 2010-2020 (zero MI in 2020)

**FMI** - grades to SSA intermediate projection long-term rate over 10 years  
**Approach 1** = no FMI deterioration for COVID-19  
**Approach 2** = apply deterioration due to COVID-19 for first 3 years  
**Approach 3** = apply greater 50 percent greater deterioration due to COVID-19 for first 3 years (sensitivity)

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Note: All of the valuation date deterministic reserves shown on this slide are negative



# 2023 Plan

- Revisit HMI historical component calculation method in light of recent and expected experience
- Review applicability of MI scale methodology for 2008 VBT Limited Underwriting (LU) table
- Insured vs. general population MI recommendation
- Revisit smoothing and margin structures

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# Questions?

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# Appendix

## Mortality/Mortality Improvement Principles

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## Mortality/MI Industry Group

- Group representing members of the American Academy of Actuaries (“Academy”), the Society of Actuaries, and members of the National Association of Insurance Commissioners (NAIC), Life Actuarial (A) Task Force (LATF)
- Convened in January 2022
- Focused on developing a set of consistent principles to be considered in reflecting the impact of COVID-19 or other shock to mortality in valuation assumptions

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# Industry Group Principles

Valuation mortality assumption should not include the excess mortality due to the initial shock.

It should include:

“the expected ongoing mortality impact”.

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These principles are consistent with international views on mortality projection and COVID-19 impacts...

- Social Security Administration 2022 Trustees Report
  - “Projected death rates for years after 2023 are unchanged from the levels that would have been projected in the absence of the pandemic, under the assumption that increased deaths from the residual effects of living through the pandemic (both physiological and psychological) will be roughly offset by decreased deaths that instead happened sooner (during the pandemic).” <https://www.ssa.gov/OACT/TR/2022/tr2022.pdf>
- Continuous Mortality Investigation (CMI) Mortality Projections Committee
  - “If we gave full weight to 2020 data ... the reduction in life expectancy would have been in excess of what most users of the model would consider reasonable.”
  - CMI\_2021 incorporates mortality data to 31 December 2021
    - 2020 and 2021 data is given 0% weight in the Core version – Consistent with approach for CMI\_2020 supported by consultation – Data for 2020 and 2021 is unlikely to be indicative of future trends – Using 100% weight for 2020 and 2021 data would lead to excessive falls in life expectancy
- Mortality projections for Social Security Programs in Canada (Actuarial Studies No. 22 and 23)

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# Additional Considerations

- Insured population mortality materially lower than general population mortality
  - ▣ Insured population is generally in higher socioeconomic categories
  - ▣ Lower mortality and higher mortality improvement seen in higher socioeconomic categories (implicit margin in our recommendations)
- MI improvement scale annual updates should not create reserve volatility
- Individual companies should also consider their own business and make appropriate additional adjustments

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**Historical Mortality Improvement (HMI) Rates:**

**HMI Approach 1:** Determine historical average from 2009-2019

**HMI Approach 2:** Determine historical average from 2010-2020, restating 2020 to a 2019 level (assumes zero

SOA/AAA Joint Working Group.

**Future Mortality Improvement (FMI) Rates:**

**FMI Approach 2:** Reflect COVID by applying deterioration for two years, one year of stagnation (assumes zero mortality improvement in 2025), then grading to the long-term level over 7 years. Apply 25% margin.

**FMI Approach 3:** Same as Approach 2, except the deterioration in the first two years is 50% greater than that

**FMI Approach 2,3 Unloaded:** These rates are the base rates used in Approach 2 and Approach 3 without margin

**All-zero FMI:** 0% FMI, for all attained ages and projection years.

**Note:** FMI Approach 2 was recommended by the SOA/AAA Joint Working Group.

Draft: 10/6/22

Life Actuarial (A) Task Force  
Virtual Meeting  
September 15, 2022

The Life Actuarial (A) Task Force met Sept. 15, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Mark Fowler represented by Jennifer Li (AL); Ricardo Lara represented by Ted Chang and Thomas Reedy (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Glen Mulready represented by Andrew Schallhorn (OK); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Discussed its Charge Related to the VM-21 SPA and Requested Volunteers for a Drafting Group to Address This Charge

Ms. Hemphill noted that the Life Actuarial (A) Task Force would like to form a drafting group to address its charge to: “Evaluate and provide recommendations regarding the VM-21/AG 43 Standard Projection Amount, which may include continuing as a required floor or providing as disclosure.” She said that the scope of the drafting group’s work would include VM-21, Requirements for Principle-Based Reserves for Variable Annuities, and asked Mr. Slutsker, Valuation Manual (VM)-22 Subgroup chair, if it would also be appropriate to include VM-22 as well. Mr. Slutsker responded that it made sense to consider whether both the VM-21 and VM-22 standard projection amount (SPA) should be binding or a disclosure item as part of the work of the drafting group to be formed. Mr. Weber noted that the new drafting group may want to consider whether the charge can be addressed ahead of the implementation of a new economic scenario generator (ESG). Brian Bayerle (American Council of Life Insurers—ACLI) noted that an existing ACLI Annuity Experience Group may be able to help with this charge or that an ACLI SPA specific group could be formed. Mr. Slutsker, speaking in his capacity as vice president of the American Academy of Actuaries (Academy) Life Practice Council, noted three Academy groups that could assist with the work. Ms. Hemphill concluded that individuals interested in participating in the new drafting group could contact Scott O’Neal (NAIC).

2. Exposed APF 2022-06

Mr. Reedy said that the intention of amendment proposal form (APF) 2022-06 (Attachment Nine-A) was to require that companies provide information on their inflation assumption used in VM-20, Requirements for Principle-Based Reserves for Life Products, along with a rationale in their principle-based reserving (PBR) actuarial reports. Mr. Reedy noted that he believes that disclosure of the inflation assumption in the PBR actuarial report had existed in a previous version of the *Valuation Manual* and that he thinks it had been inadvertently removed.

Mr. Reedy made a motion, seconded by Mr. Chupp, to expose APF 2022-06 for a 21-day public comment period ending Oct. 5. The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

<u>Dates: Received</u>	<u>Reviewed by Staff</u>	<u>Distributed</u>	<u>Considered</u>
5/12/22	RM		
<u>Notes:</u> APF 2022-06			

**Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force  
 Amendment Proposal Form**

1. Identify yourself, your affiliation and a very brief description (title) of the issue.  
  
 Staff of Office of Principle-Based Reserving, California Department of Insurance – VM-31 reporting of inflation assumption.
  
2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:  
  
 Valuation Manual (January 1, 2022 edition), with NAIC Adoptions through August 17, 2021: VM-31 Section 3.D.5
  
3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)  
  
 Please see Appendix attached.
  
4. State the reason for the proposed amendment? (You may do this through an attachment.)  
  
 Please see attached Appendix.

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## Appendix

### *ISSUE:*

VM-31 contains no specific mention of a requirement to disclose the inflation assumption for Life PBR.

### *SECTIONS:*

VM-31 Section 3.D.5.f

### *REDLINE:*

(new)

f. Inflation – Assumed rate(s) of inflation and the underlying rationale/derivation, including any consideration given to making distinctions between short term and long term inflation rates.

### *REASONING:*

1. Restore mention of inflation rate assumption to VM-31 that had originally been there.
2. Have more consistency between Life and VA. The VA part of VM-31 does mention inflation.
3. Recognize that the recent uptick in the inflation rate may drive a desire/need for duration-specific inflation rates in PBR models.
4. Although VM-31 Section 3.D.1.a does refer to a website containing an optional template that includes mention of inflation, this falls short of mandating that inflation be covered in the company's VM-31 report.

Draft: 9/21/22

Life Actuarial (A) Task Force  
Virtual Meeting  
September 8, 2022

The Life Actuarial (A) Task Force met Sept. 8, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Ricardo Lara represented by Ted Chang, Ahmad Kamil, and Thomas Reedy (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Marlene Caride represented by Seong-min Eom (NJ); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Adopted the 2023 GRET Table

Mr. Weber made a motion, seconded by Mr. Chupp, to adopt the Society of Actuaries' (SOA's) 2023 Generally Recognized Expense Table (GRET) (Attachment Ten-A). The motion passed unanimously.

2. Adopted the AG 53 Template

Mr. Slutsker noted two editorial changes that were made to the *Actuarial Guideline LIII—Application of the Valuation Manual for Testing the Adequacy of Life Insurer Reserves* (AG 53) Template (Attachment Ten-B) after exposure: 1) more consistent labeling in the Asset Yield tabs was added; and 2) a duplicate row was deleted in the Sensitivity Test. After Ms. Hemphill inquired regarding confirmation of whether the changes could be deemed editorial, Scott O'Neal (NAIC) confirmed that the updates could be deemed as such.

Mr. Andersen then discussed a comment letter (Attachment Ten-C) that was provided by Risk & Regulatory Consulting LLC (RRC). He noted that while there are many helpful recommendations included in the comment letter, it does not make sense to change the template given the timing required for adoption and use for year-end 2022. He noted that state insurance regulators could utilize the guidance present in the comment letter in certain instances where additional information is needed from companies. He also noted that the AG 53 Template is only required to be adopted by the Task Force as described in AG 53, rather than the typical NAIC process where task force adoptions are adopted by parent committees before finally being adopted by the Executive (EX) Committee and Plenary.

Mr. Andersen made a motion, seconded by Mr. Leung, to adopt the AG 53 Template. The motion passed unanimously.

3. Heard an Update from the Index-Linked Variable Annuity (A) Subgroup

Mr. Weber noted that the Index-Linked Variable Annuity (A) Subgroup is close to having a recommendation for the consideration of the Task Force, and a draft version of the index-linked variable annuity (ILVA) actuarial guideline was exposed on Sept. 6 for a public comment period ending Sept. 16.

Mr. Serbinowski then proceeded to walk through the ILVA outline to the Task Force (Attachment Ten-D). He described the purpose of the ILVA actuarial guideline as creating a framework for determining the conditions that an ILVA product could be considered a variable annuity and therefore exempt from the nonforfeiture requirements of the *Standard Nonforfeiture Law for Individual Deferred Annuities* (#805) and consistent with the nonforfeiture requirements of the *Variable Annuity Model Regulation* (#250). He said the ILVA actuarial guideline is based on two principles: 1) the interim values defined in the contract should provide equity between the contract holder and the insurance company; and 2) the interim values should be consistent with the market value of a hypothetical portfolio over the term of the index strategy.

Mr. Leung, while noting that the Subgroup's work is focused on interim values, asked for clarification on whether the contract values on the anniversary date of the index strategy meet the definition of a variable annuity according to Model #805. Mr. Serbinowski noted that Model #805 exempts variable annuities from the nonforfeiture requirements but does not actually define what a variable annuity is.

Mr. Yanacheak noted the challenges in fitting the ILVA product into the definition of a variable annuity. Mr. Weber acknowledged that while the ILVA product is not a traditional separate account-based variable annuity, the ILVA actuarial guideline would provide a framework where states could consider these products to be variable annuities for nonforfeiture purposes. Mr. Serbinowski added that the Subgroup is trying to stay away from where the product is supported, whether it is from the separate account or general account. Instead, he said the focus is on how the products are funded and determining the interim values based on the market values of the supporting assets. Mr. Weber then noted that the Subgroup is working to define the interim values to be reflective of both downside risks and upside potential, like how a variable annuity would function.

#### 4. Exposed APF 2022-07

Brian Bayerle (American Council of Life Insurers—ACLI) delivered some high-level comments regarding the intent of amendment proposal form (APF) 2022-07. He noted that APF 2022-07 originated after APF 2018-57 was passed, and companies believed there was some ambiguity around some of the requirements in APF 2018-57. He noted that APF 2022-07 was intended to clarify that the net premium reserve (NPR) mortality adjustments were to be applied at the block of business level and not a more granular level.

David Neve (Actuarial Resources Corporation of Georgia) then gave a walk-through of the details of APF 2022-07. Mr. Chupp asked whether it would make sense for APF 2022-07 to not reference language from VM-20, Requirements for Principle-Based Reserves for Life Products, Section 6.B.5.d and instead pull the language directly into APF 2022-07. Mr. Neve welcomed the suggestion, but he asked that Mr. Chupp include his thoughts in a comment letter to allow more time for consideration. Ms. Hemphill inquired as to whether APF 2022-07, Section 6.B.5.d should also include reference to VM-20, Section 3.C.1.g. Mr. Neve asked that instead of altering APF 2022-07 for exposure, any reference changes be included in a comment letter to allow for more time for consideration.

Mr. Chupp made a motion, seconded by Mr. Andersen, to expose APF 2022-07 (Attachment Ten-E) for a 21-day public comment period ending Sept. 28. The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

<https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/09 08/Sep 08 Minutes.docx>



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**TO:** Reggie Mazyck, ASA, MAAA, Life Actuary, LATF Support  
**FROM:** Pete Miller, ASA, MAAA, Experience Study Actuary, Society of Actuaries (SOA) Research Institute  
Tony Phipps, Chair, SOA Research Institute Committee on Life Insurance Company Expenses  
**DATE:** July 23, 2022  
**RE:** 2023 Generally Recognized Expense Table (GRET) – SOA Research Institute Analysis

Dear Mr. Mazyck:

As in previous years, the Society of Actuaries Research Institute expresses its thanks to NAIC staff for their assistance and responsiveness in providing Annual Statement expense and unit data for the 2023 GRET analysis for use with individual life insurance sales illustrations. The analysis is based on expense and expense related information reported on companies' 2020 and 2021 Annual Statements. This project has been completed to assist the Life Actuarial Task Force (LATF) in its consideration of potential revisions to the GRET that could become effective for calendar year 2023. This memo describes the analysis and resultant findings.

NAIC staff provided Annual Statement data for life insurance companies for calendar years 2020 and 2021. This included data from 771 companies in 2020 and 766 companies in 2021. This decrease resumes the trend of small decreases from year to year. Of the total companies, 382 were in both years and passed the outlier exclusion tests and were included as a base for the GRET factors (375 companies passed similar tests last year).

#### APPROACH USED

The methodology for calculating the recommended GRET factors based on this data is similar to that followed the last several years. The methodology was last altered in 2015. The changes made at that time can be found in the recommendation letter sent to LATF on July 30, 2015<sup>1</sup>.

To calculate updated GRET factors, the average of the factors from the two most recent years (2020 and 2021 for those companies with data available for both years) of Annual Statement data was used. For each company an actual-to-expected ratio was calculated. Companies with ratios that fell outside predetermined parameters were excluded. This process was completed three times to stabilize the average rates. The boundaries of the exclusions have been modified from time to time; however, there were no adjustments made this year. Unit expense seed factors (the seeds for all distribution channel categories are the same), as shown in Appendix B, were used to compute total expected expenses. Thus, these seed factors were used to implicitly allocate expenses between acquisition and maintenance expenses, as well as among the three acquisition expense factors (on a direct of ceded reinsurance basis).

Companies were categorized by their reported distribution channel (four categories were used as described in Appendix A included below). There remain a significant number of companies for which no distribution channel was provided, as no responses to the annual surveys have been received from those companies. The characteristics of these companies vary significantly, including companies not currently writing new business or whose major line of business is not individual life insurance. Any advice or assistance from LATF in future years to increase the response rate to the surveys of companies that submit Annual Statements in order to reduce the number of companies in the "Other" category would be most welcomed. The intention is to

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<sup>1</sup> <https://www.soa.org/Files/Research/Projects/research-2016-gret-recommendation.pdf>

continue surveying the companies in future years to enable enhancement of this multiple distribution channel information.

Companies were excluded from the analysis if in either 2020 or 2021 (1) their actual to expected ratios were considered outliers, often due to low business volume, (2) the average first year and single premium per policy were more than \$40,000, (3) they are known reinsurance companies or (4) their data were not included in the data supplied by the NAIC. To derive the overall GRET factors, the unweighted average of the remaining companies' actual-to-expected ratios for each respective category was calculated. The resulting factors were rounded, as shown in Table 1.

### THE RECOMMENDATION

The above methodology results in the proposed 2023 GRET values shown in Table 1. To facilitate comparisons, the current 2022 GRET factors are shown in Table 2. Further characteristics of the type of companies represented in each category are included in the last two columns in Table 1, including the average premium per policy issued and the average face amount (\$000s) per policy issued.

To facilitate comparisons, the current 2022 GRET factors are shown in Table 2. Further characteristics of the type of companies represented in each category are included in the last two columns in Table 1, including the average premium per policy issued and the average face amount (\$000s) per policy issued.

**TABLE 1**  
PROPOSED 2023 GRET FACTORS, BASED ON AVERAGE OF 2019/2020 DATA

DESCRIPTION	Acquisition per Policy	Acquisition per Unit	Acquisition per Premium	Maintenance per Policy	Companies Included	Average Premium Per Policy Issued During Year	Average Face Amt (000) Per Policy Issued During Year
Independent	\$180	\$1.00	45%	\$54	141	3,073	204
Career	203	1.10	51%	61	84	2,296	197
Direct Marketing	197	1.10	49%	59	21	899	57
Niche Marketing	147	0.80	37%	44	30	507	14
Other*	153	0.90	39%	46	106	853	72
* Includes companies that did not respond to this or prior year surveys					382		

**TABLE 2**  
CURRENT 2022 GRET FACTORS, BASED ON AVERAGE OF 2017/2019 DATA

Description	Acquisition per Policy	Acquisition per Unit	Acquisition per Premium	Maintenance per Policy	Companies Included	Average Premium Per Policy Issued During Year	Average Face Amt (000) Per Policy Issued During Year
Independent	\$183	\$1.00	46%	\$55	142	3,252	194
Career	212	1.20	53%	64	77	2,327	197
Direct Marketing	200	1.10	50%	60	23	875	72
Niche Marketing	151	0.90	37%	45	24	517	13
Other*	139	0.80	35%	42	109	786	70
* Includes companies that did not respond to this or prior year surveys					375		



In previous recommendations, an effort was made to reduce volatility in the GRET factors from year-to-year by limiting the change in GRET factors between years to about ten percent of the prior value. The changes from the 2022 GRET were reviewed to ensure that a significant change was not made in this year's GRET recommendation.

All GRET factors for the other distribution channel category experienced a change greater than ten percent so the factors for these lines were capped at this ten percent level (or slightly above 10% due to rounding of the factor) from the corresponding 2022 GRET values. The volatility occurred due to incorrect NAIC data for 2018 for some companies, which caused their actual to expected ratios to be considered outliers and they were not included in the calculation. This resulted in lower final 2022 GRET factors and subsequently the same for the 2023 recommendation. Over the next one to three years, the ten percent cap will allow this difference to be graded in so calculated GRET will be used for the final recommended GRET factors.

#### USAGE OF THE GRET

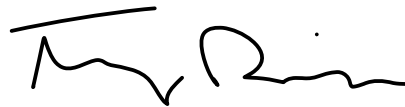
This year's survey, responded to by companies' Annual Statement correspondent, included a question regarding whether the 2022 GRET table was used in its illustrations by the company. Last year, 31% of the responders indicated their company used the GRET for sales illustration purposes, with similar percentage results by size of company; this contrasted with about 29% in 2020. This year, 35% of responding companies indicated that they used the GRET in 2022 for sales illustration purposes. The range was from 33% for Career and Niche Marketing to 43% for Independent. No companies in Career or Other used GRET. Based on the information received over the last several years, the variation in GRET usage appears to be in large part due to the relatively small sample size and different responders to the surveys.

We hope LATF finds this information helpful and sufficient for consideration of a potential update to the GRET. If you require further analysis or have questions, please contact Pete Miller at 847-706-3566.

Kindest personal regards,



Pete Miller, ASA, MAAA  
Experience Study Actuary  
Society of Actuaries Research Institute



Tony Phipps, FSA, MAAA  
Chair, SOA Research Institute Committee on  
Life Insurance Company Expenses

## APPENDIX A -- DISTRIBUTION CHANNELS

The following is a description of distribution channels used in the development of recommended 2022 GRET values:

1. Independent – Business written by a company that markets its insurance policies through an independent insurance agent or insurance broker not primarily affiliated with any one insurance company. These agencies or agents are not employed by the company and operate without an exclusive distribution contract with the company. These include most PGA arrangements.
2. Career – Business written by a company that markets insurance and investment products through a sales force primarily affiliated with one insurance company. These companies recruit, finance, train, and often house financial professionals who are typically referred to as career agents or multi-line exclusive agents.
3. Direct Marketing – Business written by a company that markets its own insurance policies direct to the consumer through methods such as direct mail, print media, broadcast media, telemarketing, retail centers and kiosks, internet, or other media. No direct field compensation is involved.
4. Niche Marketers – Business written by home service, pre-need, or final expense insurance companies as well as niche-market companies selling small face amount life products through a variety of distribution channels.
5. Other – Companies surveyed were only provided with the four options described above. Nonetheless since there were many companies for which we did not receive a response (or whose response in past years' surveys confirmed an "other" categorization (see below), values for the "other" category are given in the tables in this memo. It was also included to indicate how many life insurance companies with no response (to this survey and prior surveys) and to indicate whether their exclusion has introduced a bias into the resulting values.

**APPENDIX B – UNIT EXPENSE SEEDS**

The expense seeds used in the 2014 and prior GRETs were differentiated between branch office and all other categories, due to the results of a relatively old study that had indicated that branch office acquisition cost expressed on a per Face Amount basis was about double that of other distribution channels. Due to the elimination of the branch office category in the 2015 GRET, non-differentiated unit expense seeds have been used in the current and immediately prior studies.

The unit expense seeds used in the 2022 GRET and the 2021 GRET recommendations were based on the average of the 2006 through 2010 Annual SOA expense studies. These studies differentiated unit expenses by type of individual life insurance policy (term and permanent coverages). As neither the GRET nor the Annual Statement data provided differentiates between these two types of coverage, the unit expense seed was derived by judgment based this information. The following shows the averages derived from the Annual SOA studies and the seeds used in this study. Beginning with the 2020 Annual Statement submission this information will become more readily available.

**2006-2010 (AVERAGE) CLICE STUDIES:**

	Acquisition/ Policy	Acquisition/ Face Amount (000)	Acquisition/ Premium	Maintenance/ Policy
Term				
Weighted Average	\$149	\$0.62	38%	\$58
Unweighted Average	\$237	\$0.80	57%	\$76
Median	\$196	\$0.59	38%	\$64
Permanent				
Weighted Average	\$167	\$1.43	42%	\$56
Unweighted Average	\$303	\$1.57	49%	\$70
Median	\$158	\$1.30	41%	\$67

**CURRENT UNIT EXPENSE SEEDS:**

	Acquisition/ Policy	Acquisition/ Face Amount (000)	Acquisition/ Premium	Maintenance/ Policy
All distribution channels	\$200	\$1.10	50%	\$60

## Actuarial Guideline AAT Templates - Instructions

### Overview

These templates are intended to serve as a standardized format for submitting sensitivity testing, attribution, and disclosure requests for Actuarial Guideline AAT, consistent with Section 6 described within the Actuarial Guideline. The objective of such templates is to provide results associated with the actuarial guideline in an easy-to-digest manner, with the intention of educating regulators on the yield or spread (as applicable) assumptions reflected for each asset class for asset adequacy testing purposes. Companies are encouraged to read the below instructions and use their best efforts and judgement in completing the exercise. In addition, companies may provide commentary to further explain certain data items or for regulators to consider as it relates to improving the exercise for future reporting years. Companies must submit the templates by April 1 following the applicable valuation date for the asset adequacy testing submission.

### Asset Summary Tab

Scope: Applies to all general account and non-unitized separate account assets supporting liabilities in Exhibits 5, 6, 7, and 8 of the Annual Statement reflected in asset adequacy analysis for the company. Refer to Section 2 of the Actuarial Guideline for more details.

Granularity: Provide one template for all portfolios and applicable business in aggregate; shall also submit separate templates for each line of business or portfolio to the extent separate templates are submitted for the other tabs.

Amount field: Provide the amount consistent with the valuation basis held for statutory accounting (i.e., book value for corporate bonds, market value for equities, etc.) as of the valuation date. The amounts should tie to the statement amount of assets used in asset adequacy analysis (not necessarily the actual statutory balance sheet) as of the valuation date.

P.H.N.Y. Amount field: Provide the amount of assets as of the valuation date within each category that meets the definition of "Projected High Net Yield Assets" in Section 3F of the Actuarial Guideline.

Affiliate Amount field: Provide the amount of assets as of the valuation date within each category that is originated by affiliated legal entities or other entities within same insurance group.

Reinvestment Allocation field: Provide the reinvestment strategy assumption for new asset purchases in asset adequacy analysis.

- If reinvestment strategy assumptions vary by different lines of business or portfolios, then the company may provide separate templates for each. However, an aggregate template is still also required, in which the aggregate reinvestment allocation assumption shall be determined by weighting the assumptions across different segments based on the "Amount" column.

- If reinvestment strategy assumptions vary by scenario, then use the assumption for the level scenario and describe in commentary how the assumption may differ for different asset adequacy analysis scenarios.
- If reinvestment strategy assumptions vary by duration, then the company should only show the long-term reinvestment strategy assumption used in asset adequacy analysis. If there is no clear long-term reallocation assumption, then the company can use a simplification to provide one value and describe in the commentary section.

Asset Spreads - Initial Assets and Asset Spreads - Reinvestments Tabs

Scope: Applies to all general account and non-unitized separate account assets supporting liabilities in Exhibits 5, 6, 7, and 8 of the Annual Statement reflected in asset adequacy analysis for the company, with the exception of treasuries and agencies.

Granularity: Company may either submit a template for each segment (i.e., portfolios and lines of business) or submit one aggregate template for the full company asset adequacy analysis (in which case, please describe the approach for how data was aggregated across different portfolios and lines of business in the commentary section).

Gross Yield field: Provide the gross yield consistent with the valuation basis held for statutory accounting in asset adequacy analysis (i.e., book value for corporate bonds, market value for equities, etc.). For equity-like instruments, this field should include the total return, including both price appreciation and dividend income. For derivatives, please either estimate in a level scenario or use actuarial judgement.

Default Assumption field: Provide the default assumption used in asset adequacy analysis, inclusive of any margins or provisions for adverse deviation reflected.

Investment Expense Assumption field: Provide the investment expense assumption used in asset adequacy analysis, inclusive of any margins or provisions for adverse deviation reflected.

Other field: Provide the any additional components necessary to arrive at the net spread, whether positive or negative, and describe these components in the "other" field provided in the template.

Max Gross Yield field: Provide the greatest gross yield reflected for any given asset modeled in asset adequacy analysis. If the company holds an immaterial amount of that asset, then the company has the option to provide a gross yield such that no more than 0.5% of the assets held in the portfolio exceed this gross yield. For reinvestments, the company is to provide this for the level scenario and either provide a long-term projected yield or use judgement with commentary provided.

Max Net Yield field: Provide the greatest net yield reflected for any given asset modeled in asset adequacy analysis. If the company holds an immaterial amount of that asset, then the company has the option to provide a net yield such that no more than 0.5% of the assets held in the portfolio exceed this net yield. For reinvestments, the company is to provide this for the level scenario and either provide a long-term projected yield or use judgement with commentary provided.

Affiliate vs. Non-Affiliate field: Provide entries in the template separately for affiliate vs. non-affiliate. Affiliate refers to assets originated by affiliated legal entities or other entities within same insurance group. Non-affiliated refers to all other assets not categorized as affiliate.

Yield assumptions that vary by duration: If yield assumptions vary by duration in the level scenario, then the actuary should only include long-term assumptions in the "Asset Spreads - Reinvestments" tab. If there is not one clear long-term assumption, then the judgement shall be used with accompanying commentary in the template.

#### Sensitivity Test Tab

Scope: Applies to all general account and non-unitized separate account assets supporting liabilities in Exhibits 5, 6, 7, and 8 of the Annual Statement reflected in asset adequacy analysis for the company, with the exception of assets listed in Section 3Fiii of the Actuarial Guideline (and the two left column fields are not to be completed for Equity-Like Instruments).

Granularity: Company may either submit a template for each segment (i.e., portfolios and lines business) or submit one aggregate template used for the full company asset adequacy analysis (in which case, please describe the approach for how data was aggregated across different portfolios and lines of business in the commentary section).

Percentage of Assets with Reduced Spread field: Calculate the percent of assets that required adjustments to the investment yield to comply with the in Section 5A of the Actuarial Guideline. This percentage shall be calculated based on the asset amount. Since the sensitivity test only applies to reinvestments, the company may choose to calculate this percentage at the tenth projected year in the level scenario in asset adequacy analysis, or can use an alternative approach if described in the commentary section.

Spread Reduction field: Provide the aggregate amount of spread or investment rate that was reduced to fit the requirements of the sensitivity test in Section 5A of the Actuarial Guideline. To provide this number in aggregate across assets within each asset type, weight by the asset amount. Since the sensitivity test only applies to reinvestments, the company may choose to calculate this reduction amount at the tenth projected year in the level scenario for asset adequacy analysis, or can use an alternative approach if described in the commentary section.

Cash Flow Testing sidebar: Provide the results of asset adequacy analysis using the present value of market value of surplus metric in the level scenario for completing the sensitivity test in Section 5A of the Actuarial Guideline. Use a step-by-step impact test where change for Section 5a(a) is completed first, then Section 5a(b) is completed next, and then the total impact is the aggregate change. If the company uses any simplifications or an alternative process to determine the impact, please provide commentary.

"Other Derivative Instruments" row: Unlike the "Derivative Instruments linked to Equity-Like Instruments", the "Other Derivative Instruments" row requests entries for the fields labeled "Percentage of Assets with Reduced Spread" and "Spread Reduction". This is because while "Derivative Instruments linked to Equity-Like Instruments" may be considered Equity-Like Instruments, this may not be the case for derivatives linked to underlying assets other than equities or similar instruments. Therefore, the intention is that such assets would be subject to the Investment Grade Net Spread Benchmark and those two fields would be applicable.

#### Attribution - Initial Assets and Attribution - Reinvestments Tabs

Scope: Applies to all general account and non-unitized separate account assets supporting liabilities in Exhibits 5, 6, 7, and 8 of the Annual Statement reflected in asset adequacy analysis for the company, with the exception of assets listed in Section 3F(iii) of the Actuarial Guideline and Equity-Like Instruments.

Granularity: Company may either submit a template for each segment (i.e., portfolios and lines business) or submit one aggregate template used for the full company asset adequacy analysis (in which case, please describe the approach for how data was aggregated across different portfolios and lines of business in the commentary section).

Net Market Spread field: Provide the Net Market Spread, as defined in Section 3 of the Actuarial Guideline, for each asset type.

IG Net Spread Benchmark field: Provide the Investment Grade Net Spread Benchmark, as defined in Section 3 of the Actuarial Guideline, for each asset type.

Guideline Excess Spread field: Provide the Guideline Excess Spread, as defined in Section 3 of the Actuarial Guideline, for each asset type.

Credit Risk field: Provide the component of the Guideline Excess Spread that is attributable to credit risk, as described in Section 5B of the Actuarial Guideline.

Illiquidity Risk field: Provide the component of the Guideline Excess Spread that is attributable to illiquidity risk, as described in Section 5B of the Actuarial Guideline.

Other Risk Component fields: Fill out the additional headers and add more risk component fields that comprise the Guideline Excess Spread as needed.

"Other Derivative Instruments" row: Unlike the "Derivative Instruments linked to Equity-Like Instruments", the "Other Derivative Instruments" row requests entries for the attribution fields. This is because while "Derivative Instruments linked to Equity-Like Instruments" may be considered Equity-Like Instruments, this may not necessarily be the case for derivatives linked to underlying assets other than equities or similar instruments. Therefore, the intention is that such assets would be subject to attribution analysis requirements.



**Asset Summary for Asset Adequacy Testing**

Asset Type	Amount <sup>1</sup> (\$M)	%	P.H.N.Y. Amount (\$M)	%	Affiliate <sup>2</sup> Amount (\$M)	%	Reinvestment Strategy (%)
Treasuries and Agencies	0.0	0%	0	0%	0	0%	0%
Public Non-Callable, Non-Convertible Corporate Bonds <sup>3</sup>	0.0	0%	0	0%	0	0%	0%
Callable Bonds	0.0	0%	0	0%	0	0%	0%
Convertible Securities <sup>4</sup>	0.0	0%	0	0%	0	0%	0%
Floating Rate Corporate Notes	0.0	0%	0	0%	0	0%	0%
Municipal Bonds	0.0	0%	0	0%	0	0%	0%
Other Private Bonds	0.0	0%	0	0%	0	0%	0%
Non-Convertible Preferred Stock	0.0	0%	0	0%	0	0%	0%
Agency Mortgage Backed Securities	0.0	0%	0	0%	0	0%	0%
Non-Agency Commercial Mortgage Backed Securities	0.0	0%	0	0%	0	0%	0%
Non-Agency Residential Mortgage Backed Securities	0.0	0%	0	0%	0	0%	0%
Collateralized Loan Obligations	0.0	0%	0	0%	0	0%	0%
Other Asset Backed Securities	0.0	0%	0	0%	0	0%	0%
Equities or Equity-Like Instruments	0.0	0%	0	0%	0	0%	0%
Real Estate	0.0	0%	0	0%	0	0%	0%
Mortgage Loans	0.0	0%	0	0%	0	0%	0%
Schedule BA Assets - Equity-Like Instruments	0.0	0%	0	0%	0	0%	0%
Schedule BA Assets - Non-Equity-Like Instruments	0.0	0%	0	0%	0	0%	0%
Derivative Instruments	0.0	0%	0	0%	0	0%	0%
Other - Not Covered Above <sup>5</sup>	0.0	0%	0	0%	0	0%	0%
<b>Total</b>	<b>0.0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0%</b>

(1) Amount provided should be consistent with the valuation basis held for statutory accounting (i.e., book value for corporate bonds, market value for equities, etc.) as of the valuation date  
 (2) "Affiliate Amount" means the amount of assets as of the valuation date within each category that is originated by affiliated legal entities or other entities within same insurance group  
 (3) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability  
 (4) Convertible securities include convertible preferred stock

(5) Description of assets within "Other - Not Covered Above" Category	Additional Commentary

**Section 4a: Net Yield Component Summary for Asset Adequacy Testing - Initial Assets**

Asset Type	Gross Yield <sup>1</sup>	Default Assumption	Investment Expenses	Other <sup>5</sup>	Net Yield	Max Gross Yield	Max Net Yield	Check
<b>Nonaffiliated<sup>2</sup></b>								
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Public Non-Callable, Non-Convertible Corporate Bonds <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Convertible Securities <sup>4</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Equities or Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Real Estate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Non-Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Derivative Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
<b>Affiliated<sup>2</sup></b>								
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Public Non-Callable, Non-Convertible Corporate Bonds <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Convertible Securities <sup>4</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Equities or Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Real Estate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Non-Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Derivative Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE

(1) Yields provided should be consistent with the valuation basis held for statutory accounting (i.e., book value for corporate bonds, market value for equities, etc.)

(2) Affiliate refers to assets originated by affiliated legal entities or other entities within same insurance group

(3) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability

(4) Convertible securities include convertible preferred stock

(5) Description of net Yield component within "Other" Category

Additional Commentary

**Section 4a: Net Yield Component Summary for Asset Adequacy Testing - Reinvestments**

Asset Type	Gross Yield <sup>1</sup>	Default Assumption	Investment Expenses	Other <sup>5</sup>	Net Yield	Max Gross Yield	Max Net Yield	Check
<b>Nonaffiliated<sup>2</sup></b>								
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Public Non-Callable, Non-Convertible Corporate Bonds <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Convertible Securities <sup>4</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Equities or Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Real Estate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Non-Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Derivative Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
<b>Affiliated<sup>2</sup></b>								
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Public Non-Callable, Non-Convertible Corporate Bonds <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Convertible Securities <sup>4</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Equities or Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Real Estate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Non-Equity-Like Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Derivative Instruments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE

(1) Yields provided should be consistent with the valuation basis held for statutory accounting (i.e., book value for corporate bonds, market value for equities, etc.)

(2) Affiliate refers to assets originated by affiliated legal entities or other entities within same insurance group

(3) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability

(4) Convertible securities include convertible preferred stock

(5) Description of net Yield component within "Other" Category

Additional Commentary

**Section 5a: Sensitivity Test assuming Investment Grade Net Spread Benchmark**

Asset Type	Percentage of Assets with Reduced Spread <sup>1</sup>	Spread Reduction <sup>2</sup>
Treasuries and Agencies	N/A	N/A
Public Non-Callable, Non-Convertible Corporate Bonds <sup>4</sup>	N/A	N/A
Callable Bonds	0.0%	0.0%
Convertible Securities <sup>5</sup>	0.0%	0.0%
Floating Rate Corporate Notes	0.0%	0.0%
Municipal Bonds	0.0%	0.0%
Other Private Bonds	0.0%	0.0%
Non-Convertible Preferred Stock	0.0%	0.0%
Agency Mortgage Backed Securities	0.0%	0.0%
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%
Collateralized Loan Obligations	0.0%	0.0%
Other Asset Backed Securities	0.0%	0.0%
Equities or Equity-Like Instruments	N/A	N/A
Real Estate	N/A	N/A
Mortgage Loans	0.0%	0.0%
Schedule BA Assets - Equity-Like Instruments	N/A	N/A
Schedule BA Assets - Non-Equity-Like Instruments	N/A	N/A
Derivative Instruments	N/A	N/A
Other - Not Covered Above	0.0%	0.0%
<b>Total</b>	<b>0.0%</b>	<b>0.0%</b>

- (1) "Percentage of Assets with Reduced Spread" is the percentage of asset amount for which the net spread must be reduced to comply with the cap at the Investment Grade Net Spread Benchmark  
 (2) "Net Spread Reduction" means the aggregate net spread reduction in each asset category as a result of capping individual assets at the Investment Grade Net Spread Benchmark  
 (3) Intended to measure the impact of asset adequacy testing under the level scenario for the New York 7 (i.e., NY1); may use gross premium reserve if consistent with asset adequacy testing approach  
 (4) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability  
 (5) Convertible securities include convertible preferred stock

Additional Commentary

Cash Flow Testing Present Value of Market Value of Surplus under Level Scenario <sup>3</sup>		
<b>Investment Grade Net Spread Benchmark: Section 5a(a) Test</b>	Baseline Sensitivity Test Change (%)	0 0%
<b>Equity Sensitivity: Section 5a(b) Test</b>	New Baseline Sensitivity Test Change (%)	0 0%
<b>Total Impact</b>	Baseline Sensitivity Test Change (%)	0 0%

Section 5b: Attribution for Asset Adequacy Testing Guideline Excess Spreads - Initial Assets

Asset Type	Net Market Spread	IG Net Spread Benchmark <sup>1</sup>	Guideline Excess Spread	Credit Risk	Illiquidity Risk	Excess Spread Components Related to Each Risk					
						[Other Risk Component #1]	[Other Risk Component #2]	[Other Risk Component #3]	[Other Risk Component #4]	[Other Risk Component #5]	
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Check
Public Non-Callable, Non-Convertible Corporate Bonds <sup>2</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Convertible Securities <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Equities or Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TRUE
Real Estate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TRUE
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE
Schedule BA Assets - Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TRUE
Schedule BA Assets - Non-Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TRUE
Derivative Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TRUE
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	TRUE

(1) "IG Net Spread Benchmark" = Investment Grade Net Spread Benchmark  
 (2) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability  
 (3) Convertible securities include convertible preferred stock

Additional Commentary

Section 5b: Attribution for Asset Adequacy Testing Guideline Excess Spreads - Reinvestments

Asset Type	Net Market Spread	IG Net Spread Benchmark <sup>1</sup>	Guideline Excess Spread	Excess Spread Components Related to Each Risk										
				Credit Risk	Illiquidity Risk	[Other Risk Component #1]	[Other Risk Component #2]	[Other Risk Component #3]	[Other Risk Component #4]	[Other Risk Component #5]				
Treasuries and Agencies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Public Non-Callable, Non-Convertible Corporate Bonds <sup>2</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Callable Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Convertible Securities <sup>3</sup>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Floating Rate Corporate Notes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Municipal Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other Private Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Convertible Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Agency Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Agency Commercial Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Agency Residential Mortgage Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Collateralized Loan Obligations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other Asset Backed Securities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Equities or Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Estate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mortgage Loans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Schedule BA Assets - Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Schedule BA Assets - Non-Equity-Like Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Derivative Instruments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other - Not Covered Above	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

TRUE

(1) "IG Net Spread Benchmark" = Investment Grade Net Spread Benchmark  
 (2) Only include public non-convertible, fixed-rate corporate bonds with no or immaterial callability  
 (3) Convertible securities include convertible preferred stock

Additional Commentary

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September 6, 2022

Mr. Scott O'Neil, FSA, MAAA  
Life Examination Actuary, NAIC  
1100 Walnut Street, Suite 1500  
Kansas City, MO, 64106-2197

**RE: Comments Regarding Actuarial Guideline No. 53 Data Collection Template**

Dear Mr. O'Neal:

In August of 2022, the Life Actuarial Task Force (LATF) exposed for comment a template to be used to collect data from companies that must meet the requirements of Actuarial Guideline No. 53 (AG 53).

As an interested party, RRC appreciates the opportunity to offer our comments. Should you have any questions, we would be happy to discuss with you and LATF members at your convenience.

- Overall, the template appears to be a helpful tool for regulators to obtain the information required by AG 53, as well as a helpful tool for companies to provide the required information.
- We support the guidance that companies should use "best efforts" to provide the information. Because the requirements are new, the underlying assets and models vary, sometimes significantly, from company to company, and companies will not have had a lot of time to prepare, use of this approach seems appropriate for year end 2022.
- Regarding the asset categories in the template, we recommend the following:
  - Breaking out equity and equity-like instruments, including different kinds of equity funds, into public versus private. Another potential consideration would be to request information on the market volatility of the holding, most often expressed as the beta. We note that life insurers should already have this available based on risk-based capital requirements for common stock. While there are many different ways to assess the risk profile of common stock, we consider beta, as a measure of market volatility, to be one of the simplest.
  - Breaking out private bonds between those that are considered highly marketable (e.g., tradeable under Rule 144A) versus those that are considered true private placements.
  - Adding some breakdown by asset quality, such as NAIC rating, or at least above versus below investment grade. It would also be helpful to distinguish between those bonds that are rated by an NRSRO and those that are assigned a Designation by the NAIC's Investment Analysis Office.

September 6, 2022



This is because bonds that are rated by one of the NRSROs are more marketable.

- Breaking out assets by duration bucket (such as 5-10 year buckets plus those that do not mature). While duration would be the appropriate measure, years to maturity for fixed income instruments could also be used as an indicator of interest rate risk. As interest rates rise and the shape of yield curve changes, this could become a critical consideration.
  - Breaking out the cash flow structure of RMBS between pass-through, structured cash flow, and interest-only. Cash flow variability can be a substantive factor due to prepayment variability as interest rates change.
  - Breaking out Investments Reported on Schedule BA by the basic categories of (a) collateral loans, (2) private funds, and (3) other. Investments Reported on Schedule BA continue to be an area of concern due to their lack of transparency. There is detail in the investment schedule, but having this information in the template would be helpful in determining materiality to the question at hand.
- You may want to consider including information regarding the asset's book/adjusted carrying value versus the par/accreted value. This profile can be useful in understanding the valuation profile under different economic and market environments. It would also be significant in understanding the real risk of loss to capital in stressed scenarios.

Thank you for the opportunity to provide comments on this important initiative. Please don't hesitate to contact us if you or other LATF members have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Patricia E. Matson".

Tricia Matson, Partner  
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High Points of ILVA Draft Actuarial Guideline

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

**Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

**Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

Dates: Received	Reviewed by Staff	Distributed	Considered
7/25/22	SO		
APF 2022-07			

Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force  
**Amendment Proposal Form**

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

Brian Bayerle, ACLI – Clarification of adjustments to mortality for policies subject to the NPR and for policies that pass the Life PBR Exemption when anticipated experience exceeds the prescribed CSO table.

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:

Valuation Manual (January 1, 2022 edition), VM-20 Section 3.C.1.g, VM-20 Section 6.B.5.d.

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

See attached.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

The purpose of this proposed amendment is to clarify the intent and calculation of the mortality adjustments to the CSO table when anticipated mortality exceeds the prescribed CSO table. The current wording of Section 3.C.1.g has led to confusion by many and a lack of consistent interpretations. The APF does not change the current requirements of VM-20, it only provides clarification. This APF revises the edits made by APF 2018-57.

There are five questions the APF is trying to answer:

1. **What policies are intended to be addressed by Section 3.C.1.g?**

The primary intent of Section 3.C.1.g is to address the higher anticipated mortality for policies that are not subject to full underwriting (FUW), such as simplified issue policies and final expense policies. It is typical for these types of policies to have mortality experience worse than the CSO table, and thus, an adjustment is necessary.

The intent of Section 3.C.1.g. is not to test every possible FUW subset (e.g., attained age blocks, individual underwriting classes with lower credibility, etc.) to determine if its mortality experience is higher than the CSO table even though more aggregate mortality experience is lower than the CSO table. However, if a large, credible block or subset of FUW policies (e.g., a block of FUW business assumed from another company that has significantly different mortality experience than the rest of the assuming company’s FUW business, or a large block of business from an era when the company had significantly more permissive underwriting, etc.) is expected to have worse experience than the CSO table, then the adjustments in 3.C.1.g should be made.

A guidance note has been added following Section 3.C.1.g. to provide this clarification.

2. **What is meant by the current language in Section 3.C.1.g that the “adjustments should be consistent with the adjustments made for the DET Net Premium test” in Section 6.B.5.d?**

This wording has led to a lot of confusion. Some have interpreted this wording to mean that the adjustment factors should be the same as those defined in Section 6.B.5.d. Others have concluded that this means the form of the adjustments should be the same. Others have concluded that this means the same methodology should be used to determine the adjustments. And if the company does not elect to use the DET, there are no adjustment factors to be consistent with.

This APF clarifies that for the group of policies where the DET has been elected, the methodology to test whether adjustments are needed should be consistent with Section 6.B.5.d (that is, using a comparison of the PV of future death claims) and a reasonably consistent approach should be used to determine the adjustment factors). For groups of policies where the DET has not been elected, a reasonably consistent approach should be used.

**3. Are the adjustments to the CSO table in Section 3.C.1.g determined on a seriatim basis or can policies be grouped to determine the adjustments?**

The current wording is not clear as to whether the adjustments are determined on a seriatim basis or grouped basis, resulting in inconsistent interpretations. This APF clarifies that the adjustments to the CSO table for the NPR calculation are to be determined using a group of policies (consistent with the approach used in Section 6.B.5.d), not on a seriatim basis. Since the NPR is calculated on a policy-by-policy basis, the application of the adjustments must be applied to each policy on a seriatim basis, but the factors themselves can be determined using a group of policies.

Determining the adjustment factors on a seriatim basis is inconsistent with determining mortality experience for any other purpose. When data is not credible, the resulting mortality rates may not be smooth or consistent. For example, if the anticipated experience for male age 50 results in an adjustment factor of 1.3, but the adjustment factor for male age 48 is 2.1 (based on limited non-credible data), this results in the mortality rate for male 48 being higher than the rate for male 50.

This APF clarifies that the determination of the adjustment factors in Section 3.C.1.g. is to be done on a grouped basis. However, similar to the DET requirement, a company may not group together policies with significantly different risk profiles.

**4. How do the requirements of Section 3.C.1.g apply to policies that pass the Life PBR Exemption?**

Policies that pass the Life PBR Exemption are still subject to the requirements of Section 3.C.1 (per Section II.G.4 of the Valuation Manual). But Section 3.C.1.g includes references to the NPR and the DET which do not apply to these policies. To clarify, section 3.C.1.g. has been split into two sections: 1) policies that pass the Life PBR Exemption and 2) policies that are not utilizing the Life PBR Exemption and are subject to the NPR requirements. For policies that pass the Life PBR Exemption, all references to the NPR and DET have been removed.

**5. How do the requirements in Section 3.C.1.g. apply when calculating deficiency reserves?**

Policies that pass the Life PBR Exemption still must determine deficiency reserves, which has led to confusion on how the requirements of section 3.C.1.g apply when determining deficiency reserves. Section 3.C.1 is based on the basic reserve calculation (Section 3.B.6). Once the valuation mortality rates have been adjusted (if needed) by Section 3.C.1.g for the basic reserve, then the calculation of X-factors for the deficiency reserve follows the normal approach as described in VM-A and VM-C. This APF clarifies that the mortality adjustment in 3.C.1.g only applies to the basic reserve for policies that pass the Life PBR Exemption, and not the deficiency reserve.

Deficiency reserves are not needed for policies that are not utilizing the Life PBR Exemption. The NPR for policies other than term and ULSG equals the basic reserve defined in VM-A and VM-C, the NPR for term and ULSG follow the requirements of Section 3.4 and 3.5, and the DR and SR calculations already reflect the circumstances that give rise for the need for a deficiency reserve.

Dates: Received	Reviewed by Staff	Distributed	Considered
7/25/22	SO		
APF 2022-07			

## Section 3: Net Premium Reserve

### C. Net Premium Reserves Assumptions

1.g For a group of policies where the anticipated mortality experience materially exceeds the prescribed CSO mortality rates determined in Section 3.C.1.a through 3.C.1.f above, the company shall adjust the CSO mortality rates as follows:

- i. For policies that pass the Life PBR Exemption, the CSO mortality rates used to determine the basic reserve for each policy shall be adjusted in a manner commensurate with the anticipated mortality experience for the policies, subject to a cap that ensures that mortality rates do not exceed 1,000 per 1,000. The methodology used to test whether adjustments are needed can be performed on an aggregate basis for the group of policies using a reasonable method to compare the respective mortality rates, such as comparing the present value of future death claims discounted at the valuation interest rate used for VM-A and VM-C. However, for the purposes of this comparison, a company may not group together policies with significantly different risk profiles.
- ii. For policies where the Life PBR Exemption is not utilized, the CSO mortality rates used in the NPR calculation shall be adjusted in a manner commensurate with the anticipated mortality experience for the policies, subject to a cap that ensures that mortality rates do not exceed 1,000 per 1,000.
  - a) When the company elects to use the DET in Section 6.B for a group of policies, the methodology used to test whether adjustments are needed should be consistent with the methodology used in Section 6.B.5.d (that is, using a comparison of the PV of future death claims discounted at the valuation rate used for the NPR) These adjustments should be consistent with the adjustments made for the DET Net Premium Test in Section 6.B.5 if applicable. For the purposes of this comparison, a company may not group together policies with significantly different risk profiles. The determination of the adjustment factors should use a reasonably consistent methodology to the one used in Section 6.B.5.d.
  - b) For the group of policies where the DET is not used, the company should use a reasonably consistent approach to the one described in paragraph a) above to test whether adjustments are needed and to determine the adjustment factors. The resulting adjustment factors are not required to be identical to the adjustment factors determined in paragraph a) above.

The resulting NPR must not be lower than the NPR calculated without adjustments to the CSO mortality rates.

**Guidance Note:** It is anticipated that the 3.C.1.g adjustments are generally applicable but not limited to policies with limited underwriting, such as simplified issue or final expense. The intent of Section 3.C.1.g. is not to test every possible FUW subset (e.g., attained age blocks, individual underwriting classes with lower credibility, etc.) to determine if its mortality experience is higher than the CSO table even though more aggregate mortality experience is lower than the CSO table. However, if a large,

credible block or subset of FUW policies (e.g., a block of FUW business assumed from another company that has significantly different mortality experience than the rest of the assuming company's FUW business, or a large block of business from an era when the company had significantly more permissive underwriting, etc.) is expected to have worse experience than the CSO table, then the adjustments in 3.C.1.g should be made.

## Section 6: Stochastic and Deterministic Exclusion Tests

### B. Deterministic Exclusion Test (DET)

5.d. If the anticipated mortality for the group of policies exceeds the prescribed CSO mortality rates for the NPR determined in Section 3.C.1.a through 3.C.1.f ~~valuation mortality~~, then the company shall use ~~the~~ anticipated mortality to determine the valuation net premium. For this purpose, mortality shall be measured as the present value of future death claims as of the valuation date discounted at the valuation interest rate used for the NPR.

Draft: 9/7/22

Life Actuarial (A) Task Force  
Virtual Meeting  
August 25, 2022

The Life Actuarial (A) Task Force met Aug. 25, 2022. The following Task Force members participated: Cassie Brown, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Scott A. White, Vice Chair, represented by Craig Chupp (VA); Mark Fowler represented by Jennifer Li (AL); Ricardo Lara represented by Ted Chang, Ahmad Kamil, and Thomas Reedy (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and Ben Slutsker (MN); Chlora Lindley-Myers represented by William Leung (MO); Eric Dunning represented by Derek Wallman (NE); Adrienne A. Harris represented by Bill Carmello and Michael Cebula (NY); Judith L. French represented by Peter Weber (OH); Michael Humphreys represented by Steve Boston (PA); and Jon Pike represented by Tomasz Serbinowski (UT).

1. Exposed the Mortality Improvement Rates HMI and FMI Scenarios

Marianne Purushotham (Joint American Academy of Actuaries [Academy] Mortality Improvements Life Work Group [MILWG] and Society of Actuaries [SOA] Mortality and Longevity Oversight Advisory Council [MLOAC]) presented the revisions to the 2022 Historical Mortality Improvement (HMI)/Future Mortality Improvement (FMI) Scale Development Recommendations (Attachment Eleven-A). She reminded the Task Force that one of the MILWG/MLOAC principles is that the valuation mortality assumption should not include the excess mortality or mortality deterioration from the initial mortality shock. She said the joint MILWG/MLOAC group reasoned that in the year the shock occurred and additional claims were incurred, capital had been set aside to cover those unexpected shock events. The principle holds that only if the effects of the shock on mortality are expected to be ongoing should the shock be reflected in the future mortality.

Ms. Purushotham said the first two approaches for HMI remove the COVID-19 mortality shock. Approach 3 includes the full extent of the COVID-19 shock. Ms. Purushotham said the joint MILWG/MLOAC group is recommending approach 2 because better data that would inform how to remove the shock is not available, and approach 2 resulted in less mortality improvement than approach 1.

Ms. Purushotham said approach 1 for FMI uses the calculation method the Task Force approved last year. She said approach 2 includes COVID-19 mortality deterioration in the early years of the FMI scale. Approach 3 is like approach 2 except for using 50% more COVID-19 mortality deterioration in 2023 and 2024. Ms. Purushotham said the joint MILWG/MLOAC group is recommending FMI approach 2. She said the universal life with secondary guarantees (ULSG) model office results, using the joint MILWG/MLOAC group's recommendation of HMI approach 2 and FMI approach 2, show a 5.95% decrease in the baseline deterministic reserve (DR). She said alternate run 1 uses HMI approach 3 and FMI approach 1. The ULSG model office results for alternate run 1 show a 0.68% decrease in the baseline DR. Ms. Purushotham said alternate run 2 uses HMI approach 2 with no FMI. The ULSG model office results for alternate run 2 show a 1.5% increase in the baseline DR.

Scott O'Neal (NAIC) presented the results of the term product model office. He said percent changes are not shown because the term model office reserves are computed six months after issue, so the baseline reserve amount is negative. He said the model office for the recommended approach results in a \$10,878 increase over the baseline amount. The model office alternate runs 1 and 2 show a \$38,194 increase and a \$29,561 increase over the baseline, respectively.

Ms. Hemphill suggested that an exposure could include approach 2 for HMI and approaches 2 and 3 for FMI. She said the rates for each approach will be exposed separately. Brian Bayerle (American Council of Life Insurers—ACLI) agreed to ask ACLI member companies to use the rates to run sample reserves based on their company data.

Mr. Slutsker asked if there are any reasons why the joint MILWG/MLOAC group recommendation and both alternate runs 1 and 2 could not be exposed. Ms. Hemphill said alternate 1, which combines HMI approach 3 and FMI approach 1 becomes problematic if companies use their own experience for HMI and apply FMI approach 1. She said Mr. Chupp previously voiced a concern that the combination would allow companies to gain an advantage if they do not account for COVID-19 in their company experience. Mr. Boston asked if the exposure could include HMI approach 1 and no FMI. Ms. Hemphill said she agrees with Mr. Boston's suggestion.

Mr. Slutsker suggested that in the future, the Task Force should consider the impacts of each HMI and FMI approach separately.

Mr. Chupp made a motion, seconded by Mr. Leung, to expose the model office reserve impacts of combining HMI approach 2 with FMI approach 2, HMI approach 2 with FMI approach 3, and HMI approach 1 with no FMI, as well as the rates for each of the approaches used in the model office runs for a 21-day public comment period ending Sept. 21. The motion passed unanimously.

Having no further business, the Life Actuarial (A) Task Force adjourned.

[https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/08 25/Aug\\_25 Minutes.docx](https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/LATF Calls/08 25/Aug_25 Minutes.docx)

## Reserve Impact Results - 8/25/22 Recommendation

Mortality Improvement Basis	Term	
	VM-20 Deterministic Reserve (DR)	Reserve Change
<b>Baseline: (no change from 2021)</b> Historical Mortality Improvement (HMI): 2021 VM-20 HMI Recommendation Future Mortality Improvement (FMI): No FMI	\$ (79,846)	N/A
<b>RECOMMENDATION:</b> HMI: Approach 2 (remove 2020 data) FMI Mod: Approach 2 (COVID impact in first 3 years) + margin for general uncertainty (25%)	\$ (68,968)	\$ 10,878
<b>Alternate 1:</b> HMI: Approach 3 (full COVID impact) FMI: Approach 1 (grades to LTR at year 10 from HMI level)	\$ (41,652)	\$ 38,194
<b>Alternate 2:</b> HMI: Approach 2 (remove 2020 data) FMI: No FMI	\$ (50,285)	\$ 29,561

Note: All of the valuation date deterministic reserves shown on this slide are negative

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## Reserve Impact Results - 8/25/22 Recommendation

Mortality Improvement Basis	ULSG	Term
	Qualitative Impact on DR	Qualitative Impact on DR
<b>Baseline: (no change from 2021)</b> Historical Mortality Improvement (HMI): 2021 VM-20 HMI Recommendation Future Mortality Improvement (FMI): No FMI	N/A	N/A
<b>RECOMMENDATION:</b> HMI: Approach 2 (remove 2020 data) FMI Mod: Approach 2 (COVID impact in first 3 years) + margin for general uncertainty (25%)	Largest Decrease	Smallest Increase
<b>Alternate 1:</b> HMI: Approach 3 (full COVID impact) FMI: Approach 1 (grades to LTR at year 10 from HMI level)	Smallest Decrease	Largest Increase
<b>Alternate 2:</b> HMI: Approach 2 (remove 2020 data) FMI: No FMI	Increase	Second Largest Increase

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS



December 11, 2022

**From:** Pete Weber, Chair  
The Variable Annuities Capital and Reserve (E/A) Subgroup

**To:** Rachel Hemphill, Chair  
The Life Actuarial (A) Task Force

**Subject:** The Report of the Variable Annuities Capital and Reserve (E/A) Subgroup (VACR SG) to the Life Actuarial (A) Task Force

The VACR SG has not met since the Summer National Meeting. At the request of LATF, the Chair has made a request to the Society of Actuaries to expand the work they are currently carrying out for the VM-22 Standard Projection Amount Mortality DG to include variable annuities. More specifically, to develop mortality rates to be used as prescribed assumptions within the VM-21 Standard Projection Amount.

December 11, 2022

**From:** Seong-min Eom, Chair  
The Longevity Risk (E/A) Subgroup

**To:** Rachel Hemphill, Chair  
The Life Actuarial (A) Task Force

**Subject:** The Report of the Longevity Risk (E/A) Subgroup to the Life Actuarial (A) Task Force

The Longevity Risk (E/A) Subgroup has not met since the Summer National Meeting. The subgroup will resume the meetings once the currently exposed VM-22 PBR methodology is finalized and adopted to develop and recommend longevity risk factor(s) for the product(s) that were excluded from the application of the current longevity risk factors.

December 11, 2022

**From:** Fred Andersen, Chair  
The Experience Reporting (A) Subgroup

**To:** Rachel Hemphill, Chair  
The Life Actuarial (A) Task Force

**Subject:** The Report of the Experience Reporting (A) Subgroup to the Life Actuarial (A) Task Force

The Experience Reporting (A) Subgroup has not met since the Summer National Meeting. Upcoming projects include monitoring the plans for collecting life insurance mortality and policyholder behavior data using the NAIC as the statistical agent, starting to develop mandatory reporting of variable annuity data, and continuing to work on evaluating actuarial aspects of accelerated underwriting.

Note that the Valuation Analysis Working Group (VAWG), through its company-specific reviews of asset adequacy analysis will monitor emerging trends, particularly with respect to dynamic policyholder behavior resulting from the rise in interest rates. Findings from VAWG may inform the need for upcoming data collection.

Draft: 12/1/22

Index-Linked Variable Annuity (A) Subgroup  
Virtual Meeting  
September 27, 2022

The Index-Linked Variable Annuity (A) Subgroup of the Life Actuarial (A) Task Force met Sept. 27, 2022. The following Subgroup members participated: Peter Weber, Chair (OH); Tomasz Serbinowski, Vice Chair (UT); Sarvjit Samra (CA); Vincent Tsang (IL); Derek Wallman (NE); Kevin Clarkson (NJ); Bill Carmello (NY); Rachel Hemphill (TX); and David Hippen (WA).

1. Discussed the Comments on the Proposed ILVA Actuarial Guideline

Steve Wolfrath (Ameriprise Financial), representing the American Council of Life Insurers (ACLI) said the industry does not view this as a philosophical disconnect from the current draft of the guideline but rather a technical issue to be addressed and truly illustrate that issue. The text section of the guideline that reads the index strategy base must equal the strategy value at the index strategy term start date seems like an innocent enough sentence, but it becomes problematic because it is not clear that a market value adjustment could be applied at that point in time. Our request to resolve this is to make it clearer that a market value adjustment (MVA) could be applied on the segment end date. It would create a more consistent client experience by not having this cliff issue, and that is why that change is being requested.

Serbinowski stated that no further changes should be made to the guideline outside of the fourth point in the joint ACLI and Community of Annuity Insurers (CAI) comment letter, and the discussion could now be moved to the Life Actuarial (A) Task Force highlighting the MVA issue.

Serbinowski made a motion, seconded by Hippen, to submit the Subgroup's fifth exposure of its Actuarial Guideline ILVA: Nonforfeiture Requirements for Index-Linked Variable Annuity Products, with the change from item four of the joint ACLI and CAI comment letter, to the Life Actuarial (A) Task Force. The motion passed unanimously.

Having no further business, the Index-Linked Variable Annuity (A) Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/ILVA Calls/09 27

Draft: 12/1/22

Index-Linked Variable Annuity (A) Subgroup  
Virtual Meeting  
September 20, 2022

The Index-Linked Variable Annuity (A) Subgroup of the Life Actuarial (A) Task Force met Sept. 20, 2022. The following Subgroup members participated: Peter Weber, Chair (OH); Tomasz Serbinowski, Vice Chair (UT); Sarvjit Samra (CA); Vincent Tsang (IL); Derek Wallman (NE); Kevin Clarkson (NJ); Bill Carmello (NY); Rachel Hemphill (TX); Craig Chupp (VA); and David Hippen (WA).

1. Discussed the Comments on the Proposed ILVA Actuarial Guideline

Weber discussed comments on the fifth draft of the proposed actuarial guideline (Attachment Sixteen-A), which was exposed on Sept. 5 for a public comment period ending Sept. 16. He said the comments received from industry revolve around the application of market value adjustments (MVAs).

Serbinowski commented on the complexity of the MVAs, and he stated that the issue is the market value of the hypothetical portfolio to serve as a proxy for these products that are exempt as a variable annuity (VA) product and substituting for a daily value that would be in a true unit linked VA. Clarkson stated that the MVAs in other types of annuity products deal with real numbers, and he suggested that companies could opt out of the MVA if they show that an MVA is not needed. However, that would be difficult when using a hypothetical portfolio. Beth Keith (American Academy of Actuaries—Academy) asked how one manages hypothetical portfolios when contracts extend beyond the term of the hypothetical portfolio. Serbinowski stated that the hypothetical portfolio is created for the interim values for a particular segment or term. Keith asked if the hypothetical portfolio would be created for each term. Serbinowski stated that the hypothetical portfolio would be created at the beginning of each term. Hippen stated that MVAs would be positive or negative in the interim. Weber stated that the principle is to capture the market value during the interim period. Carmello asked if MVAs are required for hypothetical bonds in this exposure, and he said the New York State Department of Financial Services (NYSDDFS) would be in favor of not having MVAs in the fixed portion. Chupp stated that the first few exposures did not require MVAs and still should not require MVAs. Weber acknowledged that there have been changes since the project started based on comments received, and there was seemingly a consensus of the group to use market values in the hypothetical portfolio, and to allow non-market values would deviate from the principles. Clarkson stated that the feedback from companies shed light on the importance of MVAs.

Adam Brown (Alliance), representing the American Council of Life Insurers (ACLI) said there is value in having flexibility for companies to offer a choice of MVAs, and he said consumers who purchase index-linked variable annuities (ILVAs) do so primarily to participate in equity performance while maintaining a level of protection. He asked for guidance on how the MVA is applied at the end of a term if the assets are longer than the term was envisioned. Serbinowski said industry has stated that they are not investing in assets that mature at the end of the term, and the formula recognizes what the companies are doing in supporting their products. Brown stated that the products come to a very similar conclusion over the life of the product whether a book value approach or a market value approach is used, and MVAs should not be required. Serbinowski said the interim values apply to the values outside the beginning and end of a term, and MVAs would not be applied on those dates since the contract language will cover the values outside of the interim values. Brown stated that the MVAs applied in that manner would create a cliff in the values on the day before the end of a term and could be difficult to explain to consumers; he said he would like to see continuity for the customer. Clarkson said the New Jersey Department of Banking and Insurance requires that daily values be available on request, and he asked why the companies would not design the product to diminish the cliff effect as it approaches the end of the term. Brown said the ACLI is

asking for flexibility as noted in the first and third points in the joint ACLI and Community of Annuity Insurers (CAI) comment letter (Attachment Sixteen-B). Steve Wolfrath (Ameriprise Financial) said Ameriprise Financial provides daily values to consumers. Carmello stated that the NYSDFS treats the ILVA products as a fixed indexed annuity with the buffer as an add-on. Weber said this guideline is attempting to produce unit-linked type values for these products. Brian Bayerle (ACLI) said the change was very significant, and state insurance regulators should consider the impact on the marketplace.

Serbinowski said the companies present these products as VAs with relief from non-forfeiture law, and the Subgroup has tried to propose a guideline that might not accommodate everything but remains true to the statement that the values vary with the investment performance of the separate accounts. Weber noted that the guideline has accomplished the goal of making these types of products variable. Chupp said the interim values will use an MVA, but that on the term start date and end date will not use the MVA. Steve Roth (CAI) stated that he thought the Subgroup had moved away from the *Variable Annuity Model Regulation* (#250) and moved more broadly into the Standard Nonforfeiture Law for Individual Deferred Annuities (#805). If the Subgroup is moving more towards Model #805, then the guideline need not be as proscriptive regarding MVAs. Serbinowski stated that VA products are exempt from Model #805, and he asked if a company can design a product that does not meet Model #805 requirements; therefore, just call that product variable. Roth stated that Model #805 does not define a VA, but Model #250 and the *Modified Guaranteed Annuity Model Regulation* (#255) have defined a VA in two ways, and the Subgroup is defining a VA in a third way. Hippen said the guideline needs to align with a model regulation to have regulatory authority. Weber said the Subgroup has been trying to make the guideline unit-linked and align with Model #250.

John M. Clymer (Prudential), representing the ACLI, said the joint ACLI and CAI comment letter points out that ILVA products allow an MVA term length equal to the index strategy term in addition to the maturity of the fixed income asset proxy. He stated that this option was included in the fourth exposure and should continue to be incorporated.

Weber said the guideline may not accommodate all products in the marketplace, and the Subgroup is trying to introduce consistency across the states for products that currently have no regulation.

The Subgroup agreed to hold an additional meeting to discuss items in the joint ACLI and CAI comment letter that had not been considered.

Having no further business, the Index-Linked Variable Annuity (A) Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/ILVA Calls/09 20

**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.



“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the maturity of the fixed income assets supporting the ILVA, and with a yield that results in

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.

The market value of the Fixed Income Asset Proxy is its book value (using the yield from a. above) adjusted using a market value adjustment formula (MVA) appropriate for the maturity of the Fixed Income Asset Proxy.

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a Derivative Asset Proxy. In determining the market value of the Fixed Income Asset Proxy an

MVA is applied to the book value of the fixed assets to approximate the market value of the fixed income assets supporting the ILVAs. No MVA is applicable to Strategy Values or Interim Values.

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and
  - e. The market value adjustment applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value

of the fixed income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance company.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. The market value of the Fixed Income Asset Proxy including the market value adjustment formula;
  - b. The market value of the Derivative Asset Proxy including any Trading Costs;
  - c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

### **Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.



September 19, 2022

Mr. Peter Weber, Chair  
Mr. Tomasz Serbinowski, Vice Chair  
National Association of Insurance Commissioners  
LATF Index-Linked Variable Annuity (ILVA) (A) Subgroup

**RE: ILVA Subgroup Exposure of *Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products***

Dear Messrs. Weber and Serbinowski:

The American Council of Life Insurers (ACLI)<sup>1</sup> and the Committee of Annuity Insurers (CAI)<sup>2</sup> appreciate the opportunity to submit the following comments to the ILVA Subgroup on the Fifth Exposure of its *Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products*. We would also like to thank you for addressing our previous concerns about the effective date of the Guideline.

- 1. Allow a Market Value Adjustment (MVA) Term Length equal to the Index Strategy Term in addition to the maturity of the Fixed Income Asset Proxy:** This option was included in the Fourth Exposure and should continue to be incorporated. Some companies are currently utilizing an approach that aligns the MVA term length with the Index Strategy Term. This approach allows consumers to connect the MVA applicability to their Index Strategy Term selection(s) while also enabling the company to design their ALM practice around the liability duration. Additionally, it takes into consideration specifications of the contract that can complicate tracking an MVA appropriate for the maturity of the Fixed Income Asset Proxy at an Index Strategy level.

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<sup>1</sup> The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

<sup>2</sup> The Committee of Annuity Insurers is a coalition of life insurance companies that issue annuities. It was formed in 1981 to address legislative and regulatory issues relevant to the annuity industry and to participate in the development of public policy with respect to securities, state regulatory and tax issues affecting annuities. The CAI's current 30 member companies represent approximately 80% of the annuity business in the United States.

**2. Requiring the Investment Base to equal the Strategy Value at the Index Strategy Term Start**

**Date:** With all of the recent updates to the Actuarial Guideline, a specific technical inconsistency has been identified. We agree with the Subgroup that MVAs should be applied in a balanced manner that provides equity to both the contract holder and insurance company and be based on the market value of assets backing the Index Strategy. However, in situations where the maturity of the Fixed Income Asset Proxy is longer than the Index Strategy Term, we respectfully submit that the first sentence of the Text section implies that an MVA may not be allowed on the Index Strategy Term start date. This requirement will cause values that are inconsistent with both principles of the guideline (equity and values based on market values) and may lead to large differences in withdrawal values for clients (inequity between clients) depending on a single day of timing. We are pleased to provide examples to further illustrate this issue upon request. Given these issues, and that the sentence appears unnecessary in defining Interim Values, we request deleting the sentence or modifying it as follows (bold italics emphasizes new wording):

*The Index Strategy Base must equal the Strategy Value (**excluding any market value adjustment**) at the Index Strategy Term start date.*

**3. Scope of MVAs:** With our consumers in mind, we respectfully request that the Subgroup maintain the level of MVA flexibility offered in previous exposure drafts and not impose a mandatory requirement of MVAs. This would allow companies discretion to provide an MVA or to bear that risk on behalf of consumers and additionally simplify the consumer experience in an unbiased manner. Consumers who purchase ILVAs do so primarily to participate in equity performance while maintaining a level of protection. We agree that contract values should be materially consistent with the market value of this equity exposure. However, interest rate exposure may not be a motivating factor for investing in ILVA contracts. We, therefore, request that the Actuarial Guideline contain language that allows for the flexibility provided in prior exposures.

**4. Clarification to the final sentence in the Drafting Note:** We respectfully request the edit below to increase clarity (bold italics emphasizes new wording):

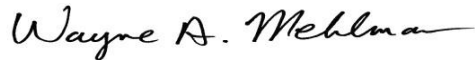
*No **additional** MVA is applicable to Strategy Values or Interim Values.*

\* \* \*

The ACLI and the CAI appreciate the opportunity to comment on the Fifth Exposure and we urge the Subgroup to consider our recommendations as it continues its progress towards a final AG.

Respectfully submitted,

AMERICAN COUNCIL OF LIFE INSURERS (ACLI)



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Draft: 9/29/22

Index-Linked Variable Annuity (A) Subgroup  
Virtual Meeting  
August 29, 2022

The Index-Linked Variable Annuity (A) Subgroup of the Life Actuarial (A) Task Force met Aug. 29, 2022. The following Subgroup members participated: Peter Weber, Chair (OH); Tomasz Serbinowski, Vice Chair (UT); Sarvjit Samra (CA); Vincent Tsang (IL); Derek Wallman (NE); David Wolf (NJ); Bill Carmello (NY); Rachel Hemphill (TX); and Craig Chupp (VA).

1. Discussed the Comments on the Proposed ILVA Actuarial Guideline

Mr. Weber discussed comments on the fourth draft of the proposed actuarial guideline (Attachment Seventeen-A), which was exposed on July 25 for a public comment period ending Aug. 23. He said the comments received from industry were primarily on two items. The first item was the application of market value adjustments (MVAs) to partial withdrawals and surrenders.

Ryan Berends (Athene, representing the American Council of Life Insurers—ACLI) said the joint ACLI and Community of Annuity Insurers (CAI) comment letter (Attachment Seventeen-B) points out that the proposed guideline is based on a market value framework. He said restricting the MVA to partial withdrawals and surrenders is inconsistent with that backdrop. He said the goal of the MVA is to mark fixed income assets to market in connection with policy transactions. He said in addition to that happening with partial withdrawals and surrenders, it also happens with deaths, annuitizations, and transfers. Mr. Berends said that rather than delineating each type of transaction that would trigger an MVA, the ACLI recommends focusing on the underlying principles of equity between the contract holder and the insurance company, and the equity language in the actuarial certification. Mr. Serbinowski asked if it makes more sense to use market values for these products instead of book values. Mr. Berends responded that the decision of whether to use market value should be based on the manufacturing and risk management considerations for the product. Mr. Serbinowski said he agrees that the MVA should be applicable to all decrements but disagrees that companies should have the freedom to decide that MVAs should not be applicable based on manufacturing and risk management considerations.

Katie Campbell (Interstate Insurance Product Regulation Commission—Compact) noted that a true variable product would require an MVA to be included when determining the value of the fixed income asset proxy. Mr. Berends suggested that one perspective is to allow situations where MVAs may not apply at all, but if the MVA does apply, it should be applied to all decrements. Mr. Serbinowski asked that if it is equitable to include an MVA, then should they always be included. Mr. Berends said that is a point well-taken. Mr. Carmello said that the New York Department of Financial Services (NYDFS) does not allow negative MVAs on death benefits because death benefits are non-elective benefits.

Beth Keith (American Academy of Actuaries—Academy) said the Academy comment letter (Attachment Seventeen-C) supports applying negative MVAs only in the case of withdrawals and surrenders. Jonathan Clymer (Prudential, representing the ACLI) asked if Mr. Carmello would allow an MVA upon death if the contract provided a return of premium benefit. Mr. Carmello said he would be comfortable with that structure. Yolanda Chow (Equitable) said that in treating the index-linked variable annuity (ILVA) like a variable annuity (VA), only a return of account value is offered, not a return of premium. She said negative MVAs are not allowed. Mr. Serbinowski said the decision whether an MVA on a death benefit is allowed should be left to the states. Mr. Carmello concurred, saying that if there is a death benefit floor, such as a return of premium, it should not be

Ms. Keith said that instead of using the term “fixed income asset proxy,” the guideline should reference fixed income invested assets. Mr. Serbinowski disagreed with the Academy’s proposed change. Mr. Weber said the issue will be returned to the drafting group.

Mr. Weber said the second item the comments focused on was the effective date. He expressed uncertainty about whether an effective date is necessary. Steve Roth (CAI) said that the ACLI/CAI comment letter suggested that if an effective date is needed, it should be bifurcated for new and existing contracts, with the dates being April 2023 and July 2024, respectively. Mr. Bayerle said he believes that having an effective date will be helpful. Mr. Carmello suggested using July 2024 as the effective date for both new and existing contracts. Mr. Serbinowski said that it is not clear why companies need so much lead time to comply with the guideline.

Having no further business, the Index-Linked Variable Annuity (A) Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/ILVA Calls/08 29



**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products Supported by  
~~Non-Unitized Accounts~~**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements. ~~The current products that include a risk of loss throughout the life of the contract and negative index returns subject to include limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits. However, unlike traditional non-variable indexed annuities, these annuities may reflect negative index returns.~~

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA ~~products-accounts~~ are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death

benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

~~This guideline does not apply to an annuity contract or a subaccount of an annuity contract that is subject to the requirements of NAIC Model 805, Standard Nonforfeiture Law for Individual Deferred Annuities.~~

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between ~~to both~~ the contract holder and the insurance company
2. Interim Values are consistent with the value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

~~The value of t~~The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the weighted average maturity of the fixed income assets supporting the ILVA, and:

- a. With a yield that results in
  - i. At the beginning of the Index Strategy Term the value of the asset equal to the Index Strategy Base less the Derivative Asset Proxy value;
  - ii. Earns interest at a rate that results in the Fixed Income Asset Proxy equal to the Index Strategy Base at the end of the Index Strategy Term in the book value of the asset, assuming no change in interest rates, projected to equal the Index Strategy Base; and
- ~~b.~~
- ~~e.~~ May include a market value adjustments that reflects the changes in the value of the Fixed Income Asset Proxy during and at the end of each Index Strategy Term due to interest rate or credit spread movements either consistent with the Index Strategy Term or the assumed maturity of the Fixed Income Asset Proxy. A market value adjustment may only be applied to partial withdrawals and surrenders.
- b.

**Drafting Note:** Interim values are intended to reflect the market value of the hypothetical portfolio. For fixed income assets the book value of the assets plus a market value adjustment is meant to approximate the market value of the assets. Using a maturity

consistent with longer maturity assets typically used to support these products, the book value of the assets plus a market value adjustment results in a closer match to the market value of the assets held in support of the product. Because Index Strategy Terms are generally shorter than the average maturity of the supporting assets, using the Index Strategy Term to determine the market value adjustment will generally result in smaller adjustments.

~~The value of the Derivative Asset Proxy is determined assuming a package of derivative assets that replicates the index credit provided by an index strategy at the end of an Index Strategy Term. The value of the package of derivative assets is determined determinable daily. Assumptions used to value the Derivative Asset Proxy including yields, implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.~~

Interim Values must be materially consistent with the value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the ~~entire~~ Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following~~that:~~
  - a. Interim Values defined in the contract provide equity ~~to both~~ between the contract holder and the ~~insurance company;~~ company;
  - b. ~~The~~ assumptions used to value the Derivative Asset Proxy including ~~yields,~~ implied ~~volatility~~ volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible; Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. ~~The~~ contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated ~~cost attributable to reasonably expected or~~

~~actual costs at the time of unwinding any of the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy;~~

- ~~d. Any Trading ~~unwinding~~ Costs represent reasonably expected or actual costs at the time the Interim Value is calculated ~~of unwinding derivative assets in the Derivative Asset Proxy or the actual derivative assets supporting the Index Strat; and~~egy.~~
- ~~e. the market value adjustment, if any, applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value of the hypothetical fixed income asset and the formula provides for reasonable equity between the contract holder and the insurance company.~~

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.

### 3. Descriptions of

- a. Fixed Income Asset Proxy including any market value adjustment;
- b. Derivative Asset Proxy including any Trading Costs;
- c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

~~ILVA account or subaccount~~ nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

### **Effective Date**

The Guideline applies to all contracts issued on or after April 1, 2023.



August 23, 2022

Mr. Peter Weber, Chair  
Mr. Tomasz Serbinowski, Vice Chair  
National Association of Insurance Commissioners  
LATF Index-Linked Variable Annuity (ILVA) (A) Subgroup

**RE: ILVA Subgroup Exposure of Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products**

Dear Messrs. Weber and Serbinowski:

The American Council of Life Insurers (ACLI)<sup>1</sup> and the Committee of Annuity Insurers (CAI)<sup>2</sup> appreciate the opportunity to submit comments to the ILVA Subgroup on the fourth exposure of *Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products* (Fourth Exposure).

As you know, we previously submitted comments on (i) January 27 on the Subgroup's original exposure of a proposed ILVA Actuarial Guideline (AG); (ii) May 2 in response to the revised AG exposed on April 1; and (iii) July 1 in response to the revised AG exposed on June 7. We deeply appreciate the Subgroup's continued dedication to the AG, careful consideration of our prior comments, and openness to robust discussion with the industry.

We believe that the Subgroup is close to a workable final solution for the AG. There are, however, two important aspects of the Fourth Exposure that we believe require further consideration and revision:

- **Effective Date.** We do not see a single date of April 1, 2023 as manageable from a regulatory or company perspective. We recommend a bifurcated effective date for New and Existing ILVAs (as defined immediately below). The proposed April 1, 2023 effective date is manageable for ILVA contracts initially submitted for first-time approval on or after that date (New ILVAs). However, we believe it is problematic for ILVA contracts approved, or initially submitted for approval, prior to April 1, 2023 (Existing ILVAs), particularly for Existing ILVAs that will require significant AG-related revisions. In order to avoid undue burdens on insurance companies and regulators, as well as

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<sup>1</sup> The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

<sup>2</sup> The Committee of Annuity Insurers is a coalition of life insurance companies that issue annuities. It was formed in 1981 to address legislative and regulatory issues relevant to the annuity industry and to participate in the development of public policy with respect to securities, state regulatory and tax issues affecting annuities. The CAI's current 30 member companies represent approximately 80% of the annuity business in the United States.

significant market disruptions for consumers, we urge the Subgroup to consider an extended July 1, 2024 effective date for Existing ILVAs.<sup>3</sup>

- **Application of Market Value Adjustments (MVAs).** We appreciate the dialogue we've had with Subgroup members on the topic of MVAs following the July 13 ILVA Subgroup call. We are encouraged that the Fourth Exposure includes language which increases the flexibility of how MVAs integrate into the Hypothetical Portfolio framework. However, we do not believe MVAs should be restricted to partial withdrawals and surrenders. In order to better align the MVA provisions with the market value framework reflected elsewhere in the AG, we urge the Subgroup to eliminate the language restricting MVAs to partial withdrawal and surrender decrements to maintain a principles-based approach. We also suggest several other targeted clarifying changes to the Text section of the guideline.

In this regard, our recommended revisions to the AG are reflected in the attached mark-up of the Fourth Exposure and discussed more fully below.

#### **The AG Should Include an Extended Effective Date of July 1, 2024 for Existing ILVAs**

In lieu of the proposed effective date of April 1, 2023 for *all* ILVA contracts issued on or after that date, we recommend that the AG be revised to include a bifurcated effective date for New and Existing ILVAs, as follows:

##### **New ILVAs**

For New ILVAs, we are not requesting that the Subgroup reconsider the April 1, 2023 effective date. We believe the April 1, 2023 effective date to be manageable for new filings initially submitted for approval on or after this effective date.

##### **Existing ILVAs**

If our recommended Existing ILVA effective date is adopted, any Existing ILVA contracts issued on or after July 1, 2024 would need to comply with the AG.

We believe the proposed effective date is unworkable for Existing ILVAs that would require significant AG-related revisions and would impose undue hardships on issuers of those Existing ILVAs, as well as SEC and state regulators. It may also cause significant market disruption, as some companies will not be able to meet an April 1, 2023 deadline, forcing temporary withdrawal of their ILVA products from the market.

Our concerns about the proposed AG effective date for Existing ILVAs primarily relate to the significant SEC filing, state filing, and implementation challenges that some companies will face following the adoption of the AG. We believe that a July 1, 2024 effective date would provide all companies with the necessary time and flexibility to address those challenges, which we have briefly summarized below.

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<sup>3</sup> To be clear, based on this approach, the term "Existing ILVA" includes both (i) contracts approved prior to April 1, 2023 and (ii) contracts initially submitted for approval prior to April 1, 2023 that are ultimately approved on or after April 1, 2023. The AG would apply to all Existing ILVA contracts issued on or after July 1, 2024. The AG would not apply to any Existing ILVA contracts issued prior to July 1, 2024.

- **SEC Filing Challenges.** By way of background, ILVAs are securities that must be registered and periodically updated with the SEC. SEC registration calls for detailed information about ILVA product features, as well as extensive financial and other information about the issuing insurance company.

Following the AG's adoption, some companies will have to file either new or amended SEC registration statements reflecting changes to their Existing ILVA designs. The SEC filing process will be labor intensive, for both companies and SEC staff reviewers. AG-related changes may impact many SEC disclosures, especially the detailed disclosures and examples on the computation of interim values. Indeed, if a company must overhaul its interim value methodology to comply with the AG, the SEC filing process could be akin to registering an entirely new product.

In addition, it could take several months for a company to prepare and file a new or amended registration statement, respond to potentially multiple rounds of SEC staff comments, and obtain an SEC order of effectiveness. While the length of this process will depend on a company's particular facts, we expect it will take approximately six months for most companies making registration statement filings, and potentially longer for those companies that must overhaul their interim value methodologies.

*Importantly*, the SEC filing process will require companies to navigate complex timing issues. ILVAs are registered with the SEC on either Form S-1 or Form S-3, but most companies use Form S-1. As such, some companies will be making filings on Form S-1 following the adoption of the AG. Form S-1 filings require the inclusion of prior year-end audited financial statements, and, depending on the timing of the filing, may also require the inclusion of unaudited quarterly ("interim") SEC financial statements. Insurance companies using Form S-1 do not generally prepare interim SEC financial statements. Accordingly, companies using Form S-1 routinely limit the implementation of any changes that trigger registration statement filings to when interim SEC financial statements are not required, *i.e.*, May 1. May 1 also coincides with such insurance companies' requisite "Annual Update" filings. Filings at other times of the year ("Off-Cycle" filings) trigger the need for interim SEC financial statements.

With that as background, from an SEC timing perspective, the proposed April 1, 2023 effective date for Existing ILVAs presents potential undue and unmanageable burdens on insurers and regulators, as follows:

- *Annual Updates.* Form S-1 registrations must be fully amended/re-filed annually. These Annual Updates must be completed no later than May 1. Each year, companies dedicate substantial resources to Annual Updates beginning in January (sometimes earlier) through May 1. Annual Updates require all product and business-related disclosures to be fully updated, as well as the preparation of audited SEC financial statements for the prior fiscal year. It is likely that companies would opt to address any significant AG-related revisions as part of the Annual Update. However, the ability of a company to do so will depend on resource constraints, any other product or business-related matters requiring new disclosures, the timing of the AG's finalization, and the point at which the audited financial statements become available (for most companies this is not until *after* April 1 each year).

An April 1, 2023 AG effective date essentially requires the AG-related changes to be layered into insurers' upcoming 2023 Existing ILVA Annual Updates. As described above, the typical Annual Update process is already a lengthy one, and building in AG-related revisions will add additional



time to that process. Respectfully, any insurers that need to make significant product changes for the AG would need to begin that process in earnest immediately, which is not feasible given the fact that the AG changes are not yet final. Moreover, even if the changes were final, an Existing ILVA effective date that is one month sooner than ILVAs' current long-standing SEC annual May 1 compliance date creates two compliance dates that are firmly at odds. Most companies will not be able to accelerate the SEC compliance date to accommodate the AG's because they will not have their SEC audited financial statements in place by April 1 (which are essential to any SEC filing date). In addition, at that time of the year, SEC staff is working diligently to clear comments on filings by May 1, not April 1. In essence, for some companies, an April 1 Existing ILVA effective date will be unmanageable and will result in the temporary suspension of ILVA sales.

- *Off-Cycle Filings.* Form S-1 registrations may be amended or re-filed apart from an Annual Update. As noted above, however, such Off-Cycle filings present additional challenges. In particular, when making an Off-Cycle filing, a company must prepare interim SEC financial statements and other interim financial disclosures. The preparation of these interim SEC financial statements and financial disclosures is burdensome and costly, which is why S-1 insurers diligently avoid Off-Cycle filings. In this regard, it is important to understand that extending the Existing ILVA proposed effective date by a few months is not a viable solution. Any effective date that does not accommodate a May 1 filing will result in the need for interim SEC financial statements.<sup>4</sup>

We believe these very practical timing issues are important to consider. The effective date for Existing ILVAs should provide companies with the flexibility to address any significant AG-related revisions via an Annual Update (which we believe will be the strong preference) or an Off-Cycle filing, as a company sees fit based on its particular circumstances. To accomplish this, the effective date should be a reasonable period of time after May 1, 2024. We believe this flexibility will be essential in avoiding market disruption to consumers.

- ***State Filing Challenges.*** The AG will require revisions to some existing ILVA policy forms, which must be re-filed and approved in all states where an ILVA is sold. In addition, companies would be required to prepare and submit the actuarial certification and memoranda called for by the AG. This will be a resource-intensive and time-consuming process. It will also be a large burden on state insurance departments, whose staff will be responsible for reviewing and approving the complex filings. Given the significant time and effort necessary to complete these multi-state submissions, we do not view an April 1, 2023 effective date – or any effective date in 2023 – as a viable option.
- ***Implementation Challenges.*** Companies that revise their Existing ILVA designs to comply with the AG will be faced with significant challenges related to implementation. For example, such companies must: newly program systems for the administration of contracts issued on or after the effective

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<sup>4</sup> We note that whether a registration statement is for a New or Existing ILVA, the same financial statement requirements apply. With New ILVAs, however, companies will be able to comply with the April 1 AG effective date but can, in turn, delay any New ILVA launch date and SEC filing until May 1 (when the audited year-end financial statements are typically readily available). In other words, the April 1 date will not cause market disruption, it will simply potentially briefly delay New ILVA launches. Conversely, with Existing ILVAs, companies may be forced out of the market as of April 1 because they will not have the required SEC financial statements and cannot sell without them.

date (while maintaining old systems for the administration of contracts issued prior to the effective date); analyze, prepare, and/or revise marketing and other client-facing materials; train personnel and vendors on the new product designs; and engage with selling broker-dealer firms on matters such as onboarding and training. These implementation challenges will only serve to further stretch such companies' limited resources as they work towards the AG's effective date.

In order to allow for an orderly SEC filing, state filing, and implementation process, to ease the coming burdens on SEC and state insurance department staff, and to avoid significant market disruption to consumers, we recommend an extended effective date for Existing ILVAs in lieu of the effective date proposed in the Fourth Exposure. Based on our extensive experience with SEC filing, state filing, and implementation matters, we believe that a July 1, 2024 effective date would be a fair and workable solution.

### **The AG Should Maintain a Principles-Based Approach for MVAs**

As noted previously, the most material concern we have with the language in the Fourth Exposure is the sentence indicating that market value adjustments may only be applied to partial withdrawals and surrenders. We share the Subgroup's view that MVAs should apply in instances where a company would experience a mark to market impact on fixed income assets, but focusing on only partial withdrawal and surrender decrements excludes many other relevant scenarios. Examples include:

- **Death.** The payment of a death benefit involves the liquidation of fixed income assets supporting the product in a similar fashion to a full surrender. Providing a death benefit tied to market values is also consistent with the market value framework reflected elsewhere in the AG and is aligned with how traditional variable annuities work.
- **Annuitization.** While assets do not leave the insurance company in a lump sum upon annuitization, this event still involves a rebalancing (and marking to market) of fixed income assets to support the new liability profile.
- **Transfer.** This could manifest in multiple ways depending on product design, but one straightforward example is for products that offer traditional unitized VA sub-accounts. A transfer from an ILVA account to a traditional VA sub-account would lead to fixed income assets being liquidated because they wouldn't be used to back the liability in the traditional VA sub-account.

This list is not meant to be exhaustive but illustrates the need to broaden the AG's perspective on MVAs. Rather than attempting to enumerate all of the instances in which MVAs may apply, we recommend deleting the sentence in question and aligning the treatment of MVAs with the principles-based nature of the AG. This approach also works well in light of the actuarial certification related to MVAs described in item 1.e on page 4 of the AG. The certification addresses (i) the alignment with changes in fixed income asset market values, and (ii) equity between the contract holder and the insurance company. These conditions should be sufficient to ensure that MVAs are applied appropriately in ILVA products.

### **Clarifications**

The other recommended changes related to MVAs reflected in the attached mark-up are:

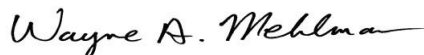
- In the first sentence of the Text section, we added a parenthetical reference to the MVA. Because the Interim Value is defined to exist at any time other than the start date and end date of an Index Strategy Term, the reference here to the Strategy Value needs to be qualified to exclude any MVA. This is applicable in instances where the maturity used for the MVA calculation is longer than the Index Strategy Term. Making this update is consistent with the AG’s subsequent language on MVAs, and also ensures that the traditional point-to-point crediting nature of ILVA accounts is maintained.
- In the second sentence of the Text section, the term “weighted average maturity” has been replaced with “investment horizon.” An MVA is a hypothetical representation of changes in fixed income asset values. The term “weighted average maturity” is inconsistent with a principles-based approach because it may be interpreted to necessitate direct calculation of a metric tied to the actual assets the insurance company holds. Our suggested term, “investment horizon”, conveys a substantively similar concept that the MVA may be tied to a time period that is different than the Index Strategy Term.
- In item a.ii of the Text section, the term “interest rates” has been replaced with “yield.” This aligns with the way item a. is framed and captures the fact that fixed income asset values are a function of both interest rates and credit spreads.
- The remaining marked changes in the Text section are not material, but may improve the clarity of the AG for readers not familiar with its development.

\* \* \*

The ACLI and the CAI appreciate the opportunity to comment on the Fourth Exposure and we urge the Subgroup to consider our recommendations as it continues its progress towards a final AG.

Respectfully submitted,

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**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset with a term equal to the Index Strategy Term.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

**Commented [A1]:** Defining the Fixed Income Asset Proxy initially as the Index Strategy Term. Then allowing for an optional market value adjustment (MVA) based on a choice of term lengths appropriate to the investment strategy.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

**Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset with a maturity based on the weighted average maturity of the fixed income assets supporting the ILVA and its value:

a.

a. With a yield that results in

b.a. at the beginning of the Index Strategy Term is the value of the asset equal to the Index Strategy Base less the Derivative Asset Proxy value;

e.b. at the end of during the Index Strategy Term, is the beginning value accumulated at an interest rate that will accumulate to equal the Index Strategy Base at in the book value of the asset, assuming no change in interest rates, projected to equal the end of the Index Strategy Term Base; and

d.c. M may additionally be adjusted by include a market value adjustment that reflects the change in the value of the Fixed Income invested assets Asset Proxy during and at the end of each Index Strategy Term either consistent with the length of the Index Strategy Term, or the assumed the maturity of the Fixed Income invested Assets Proxy, or other relevant term. A market value adjustment that reduces value may only be applied only to partial withdrawals and surrenders.

b.

**Drafting Note:** Interim values are intended to reflect the market value of the hypothetical portfolio. For fixed income assets the book value of the assets plus a market value adjustment is meant to approximate the market value of the assets. Using a maturity consistent with longer maturity assets typically used to support these products, the book value of the assets plus a market value adjustment results in a closer match to the market value of the assets held in support of the product. Because Index Strategy Terms are

**Commented [A2]:** The Fixed Income Asset Proxy is defined above. If an MVA adjustment is included it would be additional to the Fixed Income Asset Proxy.

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**Commented [A3]:** This eliminates negative MVA's on death benefits. Positive MVA's would apply to withdrawals, surrenders and death benefits.

**Commented [A4]:** The fixed income invested assets are used to determine the market value adjustment. If a market value adjustment is included it would be reflected in the interim value for only partial withdrawals and surrenders.

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generally shorter than the average maturity of the supporting assets, using the Index Strategy Term to determine the market value adjustment will generally result in smaller adjustments.

Commented [A5]: This is not needed.

The value of the package of derivative assets is determinable daily. Assumptions used to value the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to value the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated;
  - d. Any Trading unwinding Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and

Commented [A6]: Should this be rendered in redline?



e. The market value adjustment, if any, applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value of the ~~hypothetical fixed income~~ invested assets and the formula provides for reasonable equity between the contract holder and the insurance company.

**Commented [A7]:** The MVA is recommended to be part of the Interim Value and not the hypothetical fixed income asset.

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.
3. Descriptions of
  - a. Fixed Income Asset Proxy including any market value adjustment;
  - b. Derivative Asset Proxy including any Trading Costs;
  - c. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

**Effective Date**

The Guideline applies to all contracts issued on or after April 1, 2023.

**Actuarial Guideline ILVA  
Nonforfeiture Requirements for Index Linked  
Variable Annuity Products**

**Background**

**The purpose of this guideline is to specify the conditions under which an Index-Linked Variable Annuity (ILVA) is consistent with the definition of a variable annuity and exempt from Model 805 and specify nonforfeiture requirements consistent with variable annuities.**

A number of insurers have developed and are issuing annuity products with credits based on the performance of an index with caps on returns, participation rates, spreads or margins, or other crediting elements, that include a risk of negative index returns subject to limitations on the loss, such as a floor or a buffer. These products are not unitized and do not invest directly in the assets whose performance forms the basis for the credits.

There is no established terminology for these annuity products. These products go by several names, including structured annuities, registered index-linked annuities (RILA), or index-linked variable annuities, among others. This guideline refers to these products as index-linked variable annuities (ILVA).

Variable annuities are exempted from the scope of NAIC Model 805, *Standard Nonforfeiture Law for Individual Deferred Annuities*; however, NAIC Model 805 does not define the term "variable annuity".

NAIC Model 250, *Variable Annuity Model Regulation*, defines variable annuities as "contracts that provide for annuity benefits that vary according to the investment experience of a separate account" Section 7B of NAIC Model 250 provides that "to the extent that a variable annuity contract provides benefits that do not vary in accordance with the investment performance of a separate account" the contract shall satisfy the requirements of the NAIC Model 805.

The application of the NAIC Model 250 to a traditional variable annuity with unitized values is straightforward. The unitized feature provides an automatic linkage between annuity values and the investment experience of a separate account. Daily values (market values of the separate account assets) are the basis of all the benefits, including surrender values.

The fact that ILVA accounts are not unitized means they do not have values determined directly by the market prices of the underlying assets. Therefore, this guideline sets forth principles and requirements for determining values, including death benefit, withdrawal amount, annuitization amount or surrender values, such that an ILVA is considered a variable annuity and thereby exempt from Model 805. An ILVA that does not comply

with the principles and requirements of this guideline is not considered a variable annuity and therefore is subject to Model 805.

Drafting Note: This guideline interprets the term “variable annuity” for purposes of exemption from Model 805. It is not intended to modify the definition of a variable annuity under Model 250 or other Model Regulations.

### **Scope**

This guideline applies to any index-linked annuity exempt from the NAIC Model 805 on the basis that it is a variable annuity and includes index-linked crediting features that are built into policies or contracts (with or without unitized subaccounts) or added to such by rider, endorsement, or amendment.

### **Principles**

This guideline is based on the following principles:

1. Interim Values defined in the contract provide equity between the contract holder and the insurance company
2. Interim Values are consistent with the ~~market~~ value of the Hypothetical Portfolio over the Index Strategy Term.

### **Definitions**

“Derivative Asset Proxy” means a package of hypothetical derivative assets established at the beginning of an Index Strategy Term that is designed to replicate credits provided by an Index Strategy at the end of an Index Strategy Term.

“Fixed Income Asset Proxy” is a hypothetical fixed income asset.

“Hypothetical Portfolio” means a hypothetical portfolio composed of a Fixed Income Asset Proxy and a Derivative Asset Proxy.

“Index” means a benchmark designed to track the performance of a defined portfolio of securities.

“Index Strategy” means a method used to determine index credits with specified index or indices and cap, buffer, participation rate, spread, margin or other index crediting elements.

“Index Strategy Base” means the notional amount used to determine index credits that does not change throughout the Index Strategy Term except for withdrawals, transfers, deposits, loans, and any explicit charges.

“Index Strategy Term” means the period of time from the term start date to the term end date over which an index changes and the index credit is determined.

“Interim Value” means the Strategy Value at any time other than the start date and end date of an Index Strategy Term.

“Strategy Value” means the value, attributable to an Index Strategy, used in determining values including death benefit, withdrawal amount, annuitization amount or surrender values.

“Trading Cost” means the additional cost of liquidating the derivative assets in the Derivative Asset Proxy or actual derivative assets supporting the Index Strategy that is not accounted for in the Derivative Asset Proxy calculation.

### **Text**

The Index Strategy Base must equal the Strategy Value at the Index Strategy Term start date.

The Fixed Income Asset Proxy is assumed to be a hypothetical fixed income asset ~~with a maturity based on the maturity of the fixed income assets supporting the ILVA, and with a yield that results in~~

- i. at the beginning of the Index Strategy Term, the book value of the Fixed Income Asset Proxy equal to the Index Strategy Base less the Derivative Asset Proxy value; and
- ii. at the end of the Index Strategy Term, the book value of the Fixed Income Asset Proxy, assuming no change in yield, projected to equal the Index Strategy Base.

~~The market value of the Hypothetical Portfolio is the market value of the Fixed Income Asset Proxy and the market value of the Derivative Asset Proxy.~~

~~The market value of the Fixed Income Asset Proxy is its book value, using the yield above, adjusted using a market value adjustment formula (MVA) appropriate for the maturity of the Fixed Income Asset Proxy.~~

### **Drafting Note:**

The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, as stated in the Principles of the guideline, Interim Values are to should be consistent with market value of hypothetical assets supporting the ILVA (i.e. Hypothetical Portfolio). The market value of the assets may be determined by a fair value

~~methodology or by applying an MVA to the book value. The market value of the Hypothetical Portfolio is equal to the market value of a Fixed Income Asset Proxy plus the market value of a Derivative Asset Proxy. In determining the market value of the Fixed Income Asset Proxy, a state may want to consider whether excluding an MVA is applied to the book value of the fixed assets to approximate the market value of the fixed income assets supporting the ILVA appropriate. In making a determination regarding whether an MVA should be applied and, if applicable, what an acceptable MVA formula is, the state should consider whether the Interim Values provide reasonable equity between the contract holder and the insurance company. No additional MVA is applicable to Strategy Values or Interim Values.~~

The value of the package of derivative assets is determinable daily. Assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, and dividend yields must be consistent with the observable market prices of derivative assets, whenever possible.

Interim Values must be materially consistent with the market value of the Hypothetical Portfolio over the Index Strategy Term less a provision for the cost attributable to reasonably expected or actual Trading Costs at the time the Interim Value is calculated.

If a contract provides Interim Values determined using a methodology other than a Hypothetical Portfolio methodology as described in this guideline, the company must demonstrate that the contractually defined Interim Values will be materially consistent over the Index Strategy Term with the Interim Values that would be produced using the Hypothetical Portfolio methodology for each combination of Index Strategy and Index Strategy Term under a reasonable number of realistic economic scenarios that include index changes that test crediting constraints and recognize initial option pricing parameters.

The company must provide an actuarial memorandum with each ILVA product filing that includes the following:

1. Actuarial certifications must be included with each ILVA product filing and must include the following:
  - a. Interim Values defined in the contract provide equity between the contract holder and the insurance company;
  - b. The assumptions used to determine the market value of the Derivative Asset Proxy including implied volatilities, risk-free rates, dividend yields, and other parameters required to value the derivatives are consistent with the observable market prices of derivative assets over the Index Strategy Term, whenever possible. Valuation techniques include the standard Black-Scholes method, Monte-Carlo Simulation techniques, and other market consistent option valuation techniques for more complex options;
  - c. The contractually defined Interim Values are materially consistent with the Interim Values that would be produced using the Hypothetical Portfolio

methodology for each combination of Index Strategy and Index Strategy Term over the Index Strategy Term less a provision for the Trading Costs at the time the Interim Value is calculated; and

- d. Any Trading Costs represent reasonably expected or actual costs at the time the Interim Value is calculated; and

~~The market value adjustment applicable to the Fixed Income Asset Proxy, is expected to produce results reasonably similar to changes in the market value of the fixed income assets supporting the ILVA and the formula provides for reasonable equity between the contract holder and the insurance company.~~

2. If the Interim Values are determined using a methodology other than the Hypothetical Portfolio methodology described in this guideline, the actuary shall describe the testing performed to verify that the values are materially consistent with the Hypothetical Portfolio methodology. The actuary should define any parameters or assumptions used in determining material consistency and provide a summary of the results of the testing.

### 3. Descriptions of

- a. ~~The market value of the Fixed Income Asset Proxy; including the~~

- ~~a.~~ b. The market value adjustment formula, if any;

- ~~b.~~ c. The market value of the Derivative Asset Proxy including any Trading Costs; and

- ~~c.~~ d. All formulas, methodologies and assumptions used to calculate these values for each Index Strategy and Index Strategy Term as well as the sources for all assumptions.

ILVA nonforfeiture benefits for Index Strategies subject to this guideline must comply with Section 7 of Model 250 not including Section 7.B with net investment return consistent with the requirements for determining Interim Values in this guideline.

### **Effective Date**

The Guideline applies to all contracts issued on or after July 1, 2024.

November 30, 2022

Mr. Weber and Mr. Serbinowski

As a retired regulatory actuary familiar with much of the ILVA product history, I appreciate the opportunity to comment on the exposure draft. Please accept my apologies if these issues have been fully discussed in the past.

1. Regarding the **Scope**, consider a drafting note clarifying whether a design with a 0% floor is within scope or, similar to the approach noted in the absence of an MVA, include a recommendation advising states to consider whether a 0% floor (or equivalent feature) is appropriate.
2. In the paragraph where a **methodology other than a Hypothetical Portfolio methodology** is first discussed, it isn't entirely clear how the company is to "**recognize initial option pricing parameters**." Taking volatility as an example, a simplistic interpretation might be to keep volatility inputs static over the Index Strategy Term. Perhaps a less simplistic interpretation would be to assume that the initial volatility surface does not change over the Index Strategy Term. Please consider whether language such as "**recognize initial option pricing market conditions**" would be less subject to misinterpretation.
3. Please consider expanding the **Effective Date** language. In addition to addressing **contracts**, it seems prudent to reference **Index Strategy Riders** explicitly. Also, consider whether there should be a final date by which all **Index Strategies** available for election must be compliant.

Thank you again for the opportunity to offer comments.

Tom Kilcoyne, FSA, Retired  
[tjmkilcoyne@verizon.net](mailto:tjmkilcoyne@verizon.net)



November 30, 2022

Rachel Hemphill, Chair  
Craig Chupp, Vice Chair  
Life Actuarial (A) Task Force  
National Association of Insurance Commissioners

**RE: LATF Exposure of Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products**

Dear Madam Chair and Mr. Vice Chair:

The American Council of Life Insurers (ACLI)<sup>1</sup> and the Committee of Annuity Insurers (CAI)<sup>2</sup> appreciate the opportunity to submit the following comments to LATF on their 2<sup>nd</sup> exposure of *Actuarial Guideline ILVA: Nonforfeiture Requirements for Index Linked Variable Annuity Products*.

We would first like to thank the Task Force for addressing our concerns relating to Market Value Adjustment (MVA) term length, MVA optionality and Index Strategy Base. We are, however, concerned that the revised Drafting Note appears to contain a preference for the inclusion of MVAs. In order to make the Drafting Note more neutral with regard to MVAs, we suggest the following modifications (additions in green font; deletions in red font):

**Drafting Note (with modifications shown):**

*The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, Interim Values should be consistent with the market value of hypothetical assets supporting the ILVA (i.e., Hypothetical Portfolio). The market value of the assets may be determined by a fair value methodology or by applying an MVA to the book value. A state may want to consider whether ~~excluding an MVA is appropriate-necessary~~, In making a determination regarding*

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<sup>1</sup> The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

<sup>2</sup> The Committee of Annuity Insurers is a coalition of life insurance companies that issue annuities. It was formed in 1981 to address legislative and regulatory issues relevant to the annuity industry and to participate in the development of public policy with respect to securities, state regulatory and tax issues affecting annuities. The CAI's current 30 member companies represent approximately 80% of the annuity business in the United States.



~~whether an MVA should be applied and, if applicable, what an acceptable MVA formula is.~~ ~~The state should consider whether the Interim Values provide reasonable equity between the contract holder and the insurance company.~~

**Drafting Note (clean version):**

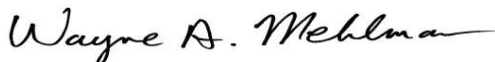
*The guideline defines the conditions under which an index linked variable annuity is exempt from Model 805 on the basis that it is a variable annuity. A variable annuity provides daily values (analogous to Interim Values in this guideline) based on the market value of separate account assets. In order to more closely align an ILVA to a variable annuity, Interim Values should be consistent with the market value of hypothetical assets supporting the ILVA (i.e., Hypothetical Portfolio). The market value of the assets may be determined by a fair value methodology or by applying an MVA to the book value. A state may want to consider whether an MVA is necessary, and if applicable, what an acceptable MVA formula is. The state should consider whether the Interim Values provide reasonable equity between the contract holder and the insurance company.*

In addition, to make it clear that the Drafting Note consists of just one paragraph, we suggest that it be indented within the Text section.

The ACLI and the CAI appreciate the opportunity to comment on this exposure as you continue to finalize the AG.

Respectfully submitted,

AMERICAN COUNCIL OF LIFE INSURERS (ACLI)



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COMMITTEE OF ANNUITY INSURERS (CAI)  
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December 11, 2022

**From:** Ben Slutsker, Chair  
The VM-22 (A) Subgroup

**To:** Rachel Hemphill, Chair  
The Life Actuarial (A) Task Force

**Subject:** The Report of the VM-22 (A) Subgroup to the Life Actuarial (A) Task Force

The VM-22 (A) Subgroup has been meeting roughly every other week since the beginning of April. The focus of calls thus far has been to address edits received on a July 2021-exposed draft of VM-22 principles-based requirements. There were nearly 400 comments in total, which were divided into four tiers based on priority. On October 4, the NAIC VM-22 Subgroup completed discussion on these comments and re-exposed another draft of the VM-22 principles-based requirements, with an exposure period ending on January 2, 2023. Several items were reflected in the newest exposure, some of which were developed subsequent to the NAIC National Summer Meeting. Some of the notable items are as follows:

- **Small Company Exemption** – Proposal to base the small company exemption off a threshold linked to prior-year fixed annuity reserves in the annual statement. The exemption would not apply to products with guaranteed living benefits.
- **Scope** – Principles describing which business is in scope of VM-22 requirements, including elements related to the applicability of nonforfeiture limits and a guarantee on the return of principal. The principles also clarify that index-linked variable annuities products are applicable to VM-21 requirements.
- **Allocation** – Modified approach to allocate statutory reserves in excess of the cash surrender value to all non-variable annuity products, including life contingent payouts, non-life contingent payouts, and accumulation annuities.
- **Longevity Reinsurance** – The Subgroup provided an update to the longevity reinsurance proposal, which now incorporates expenses in determining a k-factor to set premiums for the reserve calculation. In addition, longevity reinsurance would be treated as a separate “Reserving Category” for aggregation purposes.
- **VM-V** – A new section called “VM-V” would contain the current VM-22 requirements related to the maximum valuation rate for formulaic reserves on payout annuities. This may be applicable to payout annuity contracts issued prior to the PBR effective date, approved under the PBR exemption, or that pass the exclusion test.

After the re-exposure of the VM-22 principles-based requirements, the Subgroup has continued to meet to discuss the assumptions and methodology of a standard projection amount calculation. This has consisted of presentations made by Vincent Tsang on policyholder behavior assumptions and Seong-min

and the Society of Actuaries on mortality assumptions, following work completed by the respective NAIC drafting groups. These discussions have largely focused on the mechanics of the standard project amount, whereas the decision on whether to serve as minimum reserve floor or disclosure-only item will be determined by the associated LATF drafting group effort on this topic (which applies to both VM-21 and VM-22).

The Subgroup is also targeting a VM-22 field test for next year, which will be dependent on the progress of the Economic Scenario Generator project and accompanying field tests. This field test will be jointly led by the Academy, ACLI, and NAIC. If completed in 2023, this timing may lead to an effective date of 1/1/2025 (with a three year transition period for implementation), but the timeline will be revisited as progress in the Subgroup continues to develop.

The following pages contain a draft timeline for the NAIC VM-22 project and a summary key framework items discussed during the Subgroup calls during 2022.

**PBR VM-22 Project Draft Timeline**

**EFFECTIVE DATE GOALS**

1/1/2025

PBR VM-22 effective with three year transition period

1/1/2028

PBR VM-22 mandatory prospectively

DRAFT TIMELINE	1/1/2025												1/1/2028												1/1/2025													
	12 21	1 22	2 22	3 22	4 22	5 22	6 22	7 22	8 22	9 22	10 22	11 22	12 22	1 23	2 23	3 23	4 23	5 23	6 23	7 23	8 23	9 23	10 23	11 23	12 23	1 24	2 24	3 24	4 24	5 24	6 24	7 24	8 24					
SPA DG - develop assumptions/methodology																																						
VM22 SG calls - Address comment letters and edits																																						
ESG Field Test #1																																						
VM-22 exposure (90 days preferable)																																						
SPA Discussions at VM-22 Subgroup																																						
NAIC National Meeting December 12 - 15, Tampa FL																																						
VM-31 SG meetings to prepare recommendation																																						
VM-22 Field Test Final exposure & preparations																																						
Discuss comments from Fall VM-22 draft exposure																																						
ESG Field Test #2 (timeline estimate)																																						
VM-22 and C3P1 Field Test																																						
Compile/analyze Field Test results																																						
Discuss field test results on public calls																																						
Resolve outstanding items and changes from field test																																						
LATF exposure and discussion of comments																																						
LATF Adoption																																						
A Committee Adoption																																						
NAIC Exec & Plenary Adoption																																						

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
1	VM-22 Scope and Definitions	Keep current definitions for what is in-scope or focus only on non-variable annuities out of scope	4/13/2022, 10/4/2022	1	Exposed principles in Section II of the Valuation Manual, moved definitions to VM-01, and removed references to product names in VM-22 section 2
2	Reserving categories and aggregation	Determine Option 1 or Option 2 from exposed reserve category definitions	4/13/2022	1	Preliminary vote to pursue Option 1
3	Small Company Exemption	Fixed Annuity PBR exemption, similar to life PBR exemption for smaller carriers?	4/13/2022, 10/4/2022	1	Voted to pursue a "Fixed Annuity PBR Exemption". Exposed ACLI proposed threshold based on prior year reserves, with some modifications
4	Reinvestment Guardrail	Keep VM-20/VM-21 mix, Academy mix, TX mix, or other? Wait until field test for final decision?	4/27/2022	1	Wait until observing impact in field testing results before voting on a reinvestment mix guardrail
5	Principles & Risks Across VM Chapters	Build one section in the Valuation Manual for principles that apply to VM-20, VM-21, and VM-22	4/27/2022	2	Openness to interested party proposals for a common "principles" section, but will focus on working through other VM-22 decisions before exploring
6	General Assumptions Section	Add a section to the VM-22 draft on general considerations and requirements for assumption	4/27/2022	2	Will include a proposed general assumptions section ("Section 13") from Texas, to be consistent with a recent APF adoption on VM-21
7	Transition Period	Permit 1) early adoption and 2) retrospective adoption to the start of the 3-year transition period?	4/27/2022	2	Decided to not pursue early adoption; VM-22 will say silent on retrospective adoption to start of transition period, similar to VM-20
8	Minimum Error for Index Credit Hedges	What should be the minimum breakage expense (i.e., error) for modeling hedges supporting index credits?	5/11/2022	2	Will wait until seeing field testing results before minimum threshold
9	Longevity Reinsurance	How should longevity reinsurance be defined and treat negative reserves/recurring premiums?	5/11/2022	2	Academy presented on longevity reinsurance and will provide a refined definition; New Jersey proposal is exposed for reserving requirements
10	Categories for VM-31 Disclosures	What level of granularity should be required for disclosing PBR reserves for product groups in VM-31?	5/11/2022	2	Will wait until seeing field testing results before determining granularity of disclosures
11	Exclusion Test: SPIA contracts	Allow SPIAs to have the option of PBR vs. pre-PBR valuation without an exclusion test?	6/1/2022	2	Voted to allow SPIAs automatically pass exclusion testing, subject to criteria around optionality and a liability duration threshold (TBD)
12	Exclusion Test: PRT Certification Method	Allow PRT contracts to use the Certification Method for exclusion testing?	6/1/2022	2	Do not allow PRT to undergo the Certification Method
13	Exclusion Test: Grouping	Group between products with significantly different risk profiles?	6/1/2022	2	Do not allow grouping between products with significantly different risk profiles, consistent with VM-20 and TDI's proposal
14	Exclusion Test: Future Premiums	For the stochastic exclusion ratio test, determine whether to include future premiums	6/1/2022	2	Include future premiums in the numerator, but only benefits and expenses in the denominator, consistent with VM-20.
15	Exclusion Test: Deterministic Reserve	To pass the deterministic test, does the company need to pass or disclose 16 scenarios with baseline mortality?	6/1/2022	2	Require passing the ratio test for 16 economic scenarios under 100% of the anticipated experience mortality assumption
17	Import Reinsurance Wording from VM-20	Import VM-20 wording on incorporating contractual or additional characteristics for modeling reinsurance?	6/14/2022	2	Include proposed wording from VM-20
18	Fair Value Certification	Include fair value certification, similar to existing VM-21 requirement?	6/14/2022	2	Include fair value certification disclosure for non-index credit hedging programs
16	PRT Mortality	Permit PRT mortality with limited credibility to follow a third-party provider instead of an industry table?	6/14/2022	2	Voted in favor of using a prescribed table; do not permit a third party table upon limited credibility
19	Allocation Method	Determine Option 1 or Option 2? Wait until observing field test results before deciding?	9/21/2022	2	Using an ACLI proposal based on Option 2 for the VM-22 exposure, which addresses a tax issue for non-life contingent annuities

12/11-12/22

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
20	Working Reserve	Use a working reserve concept to serve as a floor for contracts without cash surrender value?	6/29/2022	2	Academy will work on a working reserve concept for contracts without cash surrender value, though may be little impact due to reserving categories
21	Grouping for Fund Value Depletion	Appropriate reserving category for deferred annuities with GMMBS/GMIBs that have depleted fund value	6/29/2022	2	Decided to leave these contracts in the "Payout Reserving Category" for now, but will add a drafting note to solicit feedback an optional approach
22	RBC Guidance Note	Retain the guidance note in VM-21 that discusses the relationship between reserves and RBC?	8/17/2022	3	ACLI will provide the full text for the Subgroup to consider
23	Principle 1	Should the edits to Principle 1 for VM-22 be incorporated into VM-21 as well?	8/17/2022	3	For now, will plan to focus only on VM-22, as LATF can explore the other VM chapters upon the Subgroup's recommendation of the VM-22 draft to LATF
24	Principle 2	Does setting an SR to be reasonably conservative over a span of economic cycles contradict other principles?	7/13/2022	3	ACLI will provide the full text for the Subgroup to consider
25	Aggregation Limits	Guidance note stating aggregation may not be possible for experience rated group and reinsurance treaties	7/13/2022	3	Will include this text in the VM-22 draft
26	Principle 3	Delete "Generally, assumptions are to be based on the conservative end of the confidence interval"?	7/13/2022	3	Retain this language
27	Principle 5	Delete sentence about the principle to not reduce the reserve unless reducing the risk?	7/13/2022	3	Retain this language
28	Risks not reflected	Retain or remove the list of "Risks not reflected" in VM-22?	7/13/2022	3	Remove subsection 3, but keep section 4 and update title to include "risks not reflected"
29	Separate Account References	Recommendation to delete all references to "separate accounts" in VM-22	7/13/2022	3	For now, will keep references to "separate accounts" and will add a drafting note to solicit feedback
30	Combination Risks	Proposal to delete "Risks modeled in the company's risk assessment processes that are related to the contracts"	7/13/2022	3	Retain this language
31	Immaterial Risks	Recommendation to delete sentence about not reflecting risks that do not materially affect the reserves	7/13/2022	3	Remove this language
32	Liquidity Risk	Refer to liquidity risks for "run on bank" or "sudden and significant levels of withdrawals and surrenders"	7/13/2022	3	Use the "run on bank" description
33	Significant Future Reserve Increases	Strike this item from the list of risks not reflected?	7/13/2022	3	Retain this language
34	Fixed Annuity Definition	Need to define a "fixed annuity"?	7/13/2022	3	Will replace all references to "fixed annuity" with "non-variable annuity"
35	Longevity Swaps	Are these contracts included in the definition of PRT?	7/13/2022	3	As a follow-up, Academy will include reviewing the definition of PRT when revisiting the definition of longevity risk
36	CSV and GMDB definitions	Retain VM-21 definitions for "cash surrender value" and "guaranteed minimum death benefits"?	7/13/2022	3	Will not retain the definition for "cash surrender value" and will move the "guaranteed minimum death benefits" to VM-01
37	Assumed reserve level for RBC	Question whether CTE/O was the assumed level for reserves upon determining RBC	7/19/2022	3	Question relates to RBC, and therefore did not discuss as part of the VM-22 Subgroup
38	VM-23	Consider reinstating "VM-23" to avoid confusion around the where exemptions/exclusions point to vs. PBR?	7/19/2022, 10/4/2022	3	Exposed moving the current VM-22 requirements (previously Section 14 in the VM-22 draft) to a separate "VM-V" section in the Valuation Manual.

12/1-12/22

**NAIC VM-22 Drafting Discussion Log**

#	Topic	Description	Date	Tier	Outcome
39	Pre-Reinsurance	Request to develop further guidance around pre-reinsurance	7/19/2022	3	ACL will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure
40	Deterministic Reserve	Use this term for the single scenario reserve calculated upon passing the deterministic exclusion test?	7/19/2022	3	Will replace "scenario reserve" with "deterministic reserve". Also added "aggregate minimum reserve" as the term for the final reserve
41	Deterministic Certification Option	Keep this terminology or change?	7/19/2022	3	Given that the term "deterministic reserve" will not be used, decided to keep this terminology
42	Stochastic Exclusion Test	Change Section 3.E to "Stochastic Exclusion Test" header?	7/19/2022	3	Accepted comment and made change to update header
43	Guidance Note for Exclusion Test	Remove the guidance note that clarifies that AG33/AG35 may be used upon passing the exclusion test	7/19/2022	3	Decided to remove this guidance note
44	Prudent Estimate Assumptions	Move Section 3.G to Section 4 of the document?	7/19/2022	3	Subgroup decided to hold off for now
45	Simplifications	Port over VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques?	7/19/2022	3	Subgroup agreed to add this wording for simplifications, to be consistency with VM-21
46	Review experience every three years?	Make this a requirement for the qualified actuary?	7/19/2022	3	Subgroup agreed to include a requirement to review experience every three years
47	Simplification example for the SPA	Add an example of a simplification for the SPA upon development	7/19/2022	3	Delete for now and revisit upon development of the SPA
48	Stochastic Mortality	Consider including stochastic mortality in the stochastic reserve for longevity reinsurance?	7/19/2022	3	Subgroup agreed to port over VM-20 language on stochastic modeling when static prudent estimates are not appropriate for liability assumptions
49	MVA Guidance Note	Is the market value adjustment guidance note from VM-21 still appropriate for VM-22?	8/17/2022	3	Subgroup decided to remove guidance note
50	Hedging Reorganization	Move parts of Section 4.A.4 to Section 9, which covers hedging	8/17/2022	3	Open to comments on restructuring this section during the next exposure
51	Future Hedging Programs	Align VM-22 draft to be consistent with APF 2020-12 adopted edits for VM-21?	8/17/2022	3	Subgroup decided to be consistent with APF 2020-12 language
52	Index Credit Hedge Margin	Does this reflect both model risk and real-world error? How does stress testing justify the error?	8/17/2022	3	Wording is added to state that both sources of error are reflected in the margin, in addition the reference to stress testing will be removed
53	Margin on Hedging Paragraph	Remove this paragraph if included in another section, even upon edits from TDI/OPBR?	8/17/2022	3	Open to comments on restructuring this section during the next exposure
54	Revenue Sharing	Is the section of revenue sharing applicable to non-variable products?	8/17/2022	3	Decided to retain this section
55	Projection Period	Use consistent language with VM-20?	8/17/2022	3	Kept the first sentence to be consistent with VM-20, but removed the second proposed sentence, since now the approximation section has been added
56	PIMR	Include pre-tax IMR in VM-22?	8/17/2022	3	Refer to LATF
57	MVA on CSV Floor	Apply the market value adjustment factor to the cash surrender value reserve floor for applicable products?	9/7/2022	3	Will not add language applying the MVA to the CSV floor; instead new language states the MVA shall only apply when assets are held at market value

12/11-12/22

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
58	Consistency with Managed Business	Modify NAER requirement to have assets modeled in a manner consistent with how business is managed?	8/24/2022	3	ACL will consider whether to recommend specific edits related to this comments
59	Limits on NAER	Define a specific cap or floor for the NAER instead of saying it should not be "unreasonably high"?	8/24/2022	3	Subgroup decided to modify language to change "unreasonably high" to "extremely positive or negative", which covers both directions
60	Reserve Floor	NY comment on using CARVM as a reserve floor	8/24/2022	3	Will hold off on discussing the standard projection amount until after the other sections of VM-22 are re-exposed, in Fall of 2022
61	Longevity Reinsurance & SPA	Require the k-factor approach to address negative reserve issue for longevity reinsurance in SPA?	8/24/2022	3	Will hold off on discussing the standard projection amount until after the other sections of VM-22 are re-exposed, in Fall of 2022
62	Standard Projection Amount	Equitable comment on supporting SPA with company assumptions insignificant risk factors	8/24/2022	3	Will hold off on discussing the standard projection amount until after the other sections of VM-22 are re-exposed, in Fall of 2022
63	Exclusion Testing & SPA	Modify exclusion test to address the standard projection amount?	8/24/2022	3	Will hold off on discussing the standard projection amount until after the other sections of VM-22 are re-exposed, in Fall of 2022
64	Hedging eligibility for exclusion testing	Refine wording around the restriction for not allowing blocks with hedging programs to use exclusion testing?	8/24/2022	3	Academy will suggest possible disclosures to better identify "hedging programs solely supporting index credits"
65	Mortality Stress Tests	If using the NY7 for the Certification Method, add mortality stress scenarios?	8/24/2022	3	Added language for mortality stress scenarios if using the NY7 Certification Method
66	Mortality Shock	Include the mortality shock for the ratio test based on the company materiality standard if more restrictive?	8/24/2022	3	No objections to modifying the stochastic exclusion ratio test to use the company materiality standard if more restrictive
67	Baseline Mortality Test	Include the baseline mortality test in determining the exclusion test?	6/1/2022	3	Subgroup agreed to include the baseline mortality scenario for the stochastic exclusion ratio test
68	Permutations	Include note on number of exclusion test permutations for clarity?	6/1/2022	3	Updated guidance note to include the number of permutations, inclusive of testing economic scenarios under the mortality baseline
69	Non-Proportional Reinsurance	Add definition for non-proportional reinsurance	8/24/2022	3	Decided to add a guidance note that references the APPM for clarification on the non-proportional reinsurance
70	SERT if Other Tests Fail	Prohibit passing the SERT if the demonstration test fails?	8/24/2022	3	Added language to prohibit passing the stochastic exclusion ratio test if the demonstration test fails
71	Demonstration Test	Remove options in 1.a and 2.a?	8/24/2022	3	ACL will take back and decide whether to recommend removing the demonstration test altogether, or only certain components/language
72	Deterministic Exclusion for SPA	Consider SPA for the deterministic exclusion test	8/24/2022	3	Will hold off on discussing the standard projection amount until after the other sections of VM-22 are re-exposed, in Fall of 2022
73	Deterministic Exclusion Scenario	Is the deterministic certification intended not be applicable for blocks with index credit hedging?	9/7/2022	3	Intent is for the deterministic certification option to not apply to also not apply to hedging programs supporting index credits; no changes made
74	SPA Guidance Note	Remove guidance note specifying that the deterministic exclusion test applies to SPAs?	9/7/2022	3	No objections to removing guidance note
75	Delta Hedging	Replace or remove example about delta hedging for VM-22?	9/7/2022	3	Remove example referring to delta hedging
76	Non-Elective Benefits	Remove guidance note to limit modeling non-elective benefits after CSV is depleted if reducing reserves?	9/7/2022	3	No objections to language, but removed guidance note because the similar wording already existed in the paragraph above



**NAIC VM-22 Drafting Discussion Log**

#	Topic	Description	Date	Tier	Outcome
77	100% Policyholder Efficiency	Assuming 100% policyholder inefficiency contradicts VM Section II 6.H.2, so revise VM Section II?	9/21/2022	3	Replace VM Section II language with the principle that efficiency increases over time
78	NGE Board of Directors	Comment that only allowing NGE exclusion if approved by the Board does not necessarily seem reasonable	9/21/2022	3	Removed this language from the draft, but added a drafting note to inquire on why potential language may be appropriate
79	Unsupported Judgement	Comment to remove the reference to using "unsupported actuarial judgement" from Section 11	9/21/2022	3	No objections to removing this language
80	Mortality and Reinsurance	Does Section 11.A require evaluation of a plus vs. minus segment differently for pre- vs. post reinsurance?	9/21/2022	3	This language is not included in VM-21 and was removed from the VM-22 draft
81	Mortality Improvement	Is the mortality improvement requirement intended to apply to all mortality assumptions in VM-22?	9/21/2022	3	Addressed by clarifying that this section only applies to industry mortality assumptions
82	Option 1 DR vs SR	Require separate allocation for DR vs. SR for allocation Option 1 (Section 13)?	9/21/2022	3	Agreed to add wording to clarify the allocation between the DR and SR should be separate
83	Option 2 for Direct Iteration Method	Option 2 is not designed to work for the Direct Iteration Method	9/21/2022	3	ACLI will consider adding language to address the direct iteration method
84	Option 2 Single Scenario	Could produce unstable allocation when products with different risk profiles are aggregated for PBR	9/21/2022	3	Reserving categories will require separate allocation for payouts and accumulation-based annuities
85	Index-linked annuity	This term is used in the proposed Section II, Subsection 2 draft, but is not defined	10/4/2022	3	Implicitly addressed through the proposed set of principles for scope of VM-21 vs. VM-22 in Section II of the Valuation Manual
86	Modified Guaranteed Annuities (MGAs)	VM-21 has language that exempts contracts falling under scope of MDL-255, does this contradict Section II edits?	10/4/2022	3	Implicitly addressed through the proposed set of principles for scope of VM-21 vs. VM-22 in Section II of the Valuation Manual

Draft: 12/7/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
November 30, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Oct. 12, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Exposed the Academy Proposal for SPIA Exclusion Testing

Chris Conrad (American Academy of Actuaries—Academy) walked through proposed language (Attachment Twenty-Two-A) for VM-22, Requirements for Principle-Based Reserves for Non-Variable Annuities, that would allow for single premium immediate annuities (SPIAs) and certain other products to be allowed to use pre-principle-based reserves (PBR) valuation requirements without applying for the annuity PBR exemption or performing stochastic exclusion testing. Slutsker asked what the rationale was for the Academy going with a volume of business threshold versus a durational threshold for the proposed exclusion language. Conrad noted a desire for consistency and explained that the average duration of a business line could shift around over time and, therefore, it would be possible to be eligible for exclusion one year and ineligible the next.

Leung noted that the proposed language covered more than just SPIAs and asked whether it would make sense to rename it to reflect the broader scope of payout annuities. Conrad agreed that it made sense to rename. Slutsker noted that the title could be changed to payout annuity benchmark as part of the exposure. Hemphill asked why the proposed language would allow for automatic exclusion to be granted rather than requiring approval by a domiciliary commissioner. Conrad noted that his group was charged with determining an automatic exclusion process for payout products and that they were trying to avoid optionality. Hemphill responded that because the proposed language required judgment due to the reference to the materiality of policyholder options, she is uncomfortable with allowing companies to exclude business without the approval of the domiciliary commissioner. Slutsker suggested including an additional condition in the exposure of the proposed exclusion language to require approval from the domiciliary commissioner.

Leung made a motion, seconded by Yanacheak, to expose the Academy's proposed payout annuity language for a 60-day public comment period ending February, 2<sup>nd</sup> 2023 with two edits: 1) changing the wording to note that the language applies to the broader payout annuity class of products rather than just SPIAs; and 2) including an additional condition to require approval from the domiciliary commissioner. The motion passed without objection.

2. Heard a Recommendation on SPA Expense Assumptions

Ken Lombardo (Willis Towers Watson—WTW) presented a recommendation (Attachment Twenty-Two-B) for standard projection amount (SPA) expense assumptions. Dan Kim (American Equity) asked how much overhead was allocated in the expense assumptions. Lombardo noted that a bottom-up analysis was not performed and that the expense assumptions would not cover much overhead at a typical company. Tsang asked if the recommended expense assumptions could be considered a lower bound. Lombardo said that the recommended expense assumptions were more consistent with a guardrail approach rather than a fully allocated approach that a company would use in their stochastic calculations. Chupp asked about the rationale for the inflation assumption.

Lombardo noted that it made sense to build an expense assumption that appropriately accounted for inflation. However, he said administrative expenses were not a very material part of the valuation. Hemphill noted that she would prefer expense assumptions that reflect average industry fully allocated expenses for a better comparison to the assumptions used in the stochastic reserve calculations. Slutsker noted that this is something that could be revisited later, as these expense assumptions would not be exposed today. Connie Tang (Prudential) asked whether the percent of account value administrative expense assumption from VM-21, Requirements for Principle-Based Reserves for Variable Annuities, would apply in the recommendation. Lombardo said that they would go back and look at that assumption, but the percent of account value feature could help with keeping the assumption current.

Having no further business, the VM-22 (A) Subgroup adjourned.


SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/11 30/11\_30 VM-22 Minutes.docx

**American Academy of Actuaries ARCWG Proposal  
re: SPIA Benchmark to Allow  
Use of pre-PBR Valuation Without an Exclusion Test**

**VM-22 7.A.1.d**

- d. A company not eligible for the Annuity PBR Exemption described in VM Section II 2.E may nevertheless elect to automatically exclude one or more groups of contracts from the stochastic reserve calculation without passing or performing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
- i. All of the contracts are either:
    - a. Single Premium Immediate Annuities;
    - b. Deferred Income Annuities;
    - c. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts;
    - d. Supplementary contracts (such as retained asset accounts and settlements at interest);
    - e. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts once the underlying funds are exhausted;
    - f. Term Certain Payout Annuities; or
    - g. Structured Settlement Contracts
  - ii. None of the contracts are pension risk transfer annuities (PRT), or are covered under a longevity reinsurance agreement;
  - iii. Future scheduled payout benefit amounts are either level or stay within 5% of the initial payout benefit amount over time;
  - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
  - v. The company has less than [\$X] of SPIA Exemption Reserves, and if the company is a member of an NAIC group that includes other life insurance companies, the group has combined SPIA Exemption Reserves of less than [\$Y] billion.
    1. SPIA Exemption reserves are determined as follows:
      - a. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase in Reserves During the Year-Individual Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuitizations)”), line 15; plus

- b. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase in Reserves During the Year-Group Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuityizations)”), line 15.
  
- vi. If a group of contracts that satisfies the criteria of 7.A.1.d.i to 7.A.1.d.v above for the current valuation year had been valued using the SR of VM-22 for the prior year-end, the company must continue to value the contracts under the SR requirements of VM-22 unless the domiciliary commissioner grants permission to value the contracts under VM-A, VM-C, and VM-V.



WTW  
Non-Variable Annuity Assumption  
Development – Expense Section Only  
A report for the American Academy of Actuaries

Ji Eun Choi, Karen Grote,  
Lori Helge, Craig Michaud,  
Kendrick Lombardo & Stan Roberts

May 2022

wtwco.com

wtw

## Background

- The Annuity Reserves and Capital Work Group (“ARCWG”) of the American Academy of Actuaries (the “Academy”) is developing a proposal for a framework for non-variable annuity (“non-VA”) Principles-based Reserves (“PBR”) for the following products:
  - Fixed Deferred Annuities (“FDA”) - including Fixed Indexed Annuities (“FIA”)
  - Pension Risk Transfer (“PRT”)
  - Structured Settlement Annuities (“SSA”)
  - Payout Annuities (“PA”) – including Single Premium Immediate Annuities (“SPIA”) and Deferred Immediate Annuities (“DIA”)
- The Academy engaged Willis Towers Watson US LLC (“WTW” or “we”) to assist the Work Group in providing an assumption framework for non-VA PBR, specifically as it relates to the Standard Projection Amount
- This document provides a range of values and/or best estimates for key assumptions along with the rationale based on experience we have reviewed. For those complex assumptions (e.g., SSA mortality), we provide a framework for developing the assumptions
  - For any assumptions provided, we have provided a typical range. Specific circumstances may dictate assumptions outside that range
  - We have prepared this report as input to the Work Group, and it is not meant to suggest any specific drafting of the regulation
- Please note the reliances and limitations on the following page

## Reliances and Limitations

- This document is provided solely for the internal use of the Academy and Work Group members in connection with the assumption development for non-VA PBR. It is subject to the terms and conditions in our Statement of Work dated June 14, 2021
  - It is not intended or necessarily suitable for any other purpose
  - However, the Academy may reference and include this document in connection with communications with the National Association of Insurance Commissioners (NAIC) or publications related to the intended purpose
  - Any draft deliverables will not be shared with the NAIC, or be distributed beyond the ARCWG
  - This report is intended for use by persons technically competent in the areas covered and with the necessary background information
- WTW relied on publicly available industry data (e.g., SOA studies, LIMRA study, Social Security Administration data)
- Our approach is to recommend a reasonable range (or guidance when a range is not possible) for each assumption for non-VA PBR, based on the latest industry data and our general knowledge and experience with life product valuation. Thus, it should not be viewed as WTW's actuarial opinion on the assumptions
  - Any guidance provided has inherent uncertainty, since future experience may not be well represented by past experience
  - Specifically, the long-term impact of Covid-19 on assumptions, mortality and morbidity assumptions specifically, is unclear



## Expenses

## Expenses

- For most FDAs maintenance expense costs typically are consistent with overall VA expense levels
  - Product complexity is very similar (FDA with enhanced benefits), which will translate into similar policy administration expenses
  - We expect increasing hedging/ALM needs (with increasing index account complexity and variety), as well as expected increasing sophistication of Asset Liability Management (ALM) due to increased risk and regulation support
  - We would suggest the same \$100 per policy per year (100% of VA) is used for FDAs, except simple FDAs without optional benefits.
- For Payouts, SPIAs, Structured Settlements and PRT are much simpler to administer
  - We would suggest \$50 (50% of the VA VM-21 level), based on comparable benchmarks for direct and TPA expenses
- For other simple annuity products, costs are typically less than VAs
  - For traditional fixed annuities (FDAs without optional benefits) & DIAs, administrative and hedging/ALM complexity is lower than for VAs
  - We would suggest \$75 (75% of the VA VM-21 assumption), given surrender and other product features that need to be managed





Draft: 11/30/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
October 27, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Oct. 27, 2022. The following Subgroup members participated: Ben Slutsker, Chair, and Lei Rao-Knight (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA)

1. Heard a Presentation on VM-22 SPA Mortality Assumptions

Eom said that the VM-22 Standard Projection Amount (SPA) Mortality Assumption Drafting Group had two objectives: 1) to develop an initial set of mortality adjustment factors to be used in the VM-22, Requirements for Principle-Based Reserves for Non-Variable Annuities, field test; and 2) to determine if a new set of best estimate mortality tables need to be developed based on recent experience. Joel Sklar (Society of Actuaries—SOA) then delivered a presentation (Attachment Twenty-Three-A) on the SOA's recommended mortality adjustment factors. Carmello asked if the same deferred annuity mortality would be used to value death benefits and annuitizations. Sklar noted that for death benefits, mortality is not a very critical assumption. However, he said the mortality used for living benefits and annuities would be consistent with payout annuities.

Tsang referred to the payout annuity mortality adjustment factors under age 60 and asked whether the factor of 150% would reduce the margins by too much for the affected ages. Sklar noted that the factors over age 60 were much more material. Alice Fontaine (Fontaine Consulting LLC) asked whether the factors would be applied to the mortality table and then the final mortality rates would be graduated to achieve a smooth progression from year to year. Sklar said that graduation would not be employed before age 50 due to a lack of materiality and credibility, but some smoothing would be done for age 50 and above. Slutsker noted that for guaranteed living benefit mortality, the SOA was recommending a ratio based on variable annuity experience and asked if the group had thought about alternative approaches given potential concerns with the appropriateness of the variable annuity experience to fixed annuities. Sklar said that there was active discussion on this topic, but the group did not find any better methodology to their recommendation. Sklar noted that more data would be needed on fixed annuities to be able to develop an assumption based on fixed annuity experience.

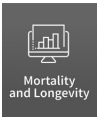
Having no further business, the VM-22 (A) Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/10 27/10\_27 VM-22 Minutes.docx

# VM-22 Standard Projection Amount (SPA) Mortality Assumption Update for Individual Annuities

Presentation to VM-22 Subgroup

Joel Sklar, ASA, MAAA



OCTOBER 27 | 2022

## Agenda

- Objectives
- Overview of Process and Progress
- Mortality Adjustment Factors for Fixed Deferred Annuities
- Mortality Adjustment Factors for Payout Annuities

# Objectives

- Short-term – Develop mortality adjustment factors based on industry experience studies for use as SPA assumptions in the VM-22 Field Tests; for Individual Annuities, distinct factors are being developed for:
  - Fixed Deferred Annuities
  - Payout Annuities
  - Structured Settlements (with Standard and Substandard lives considered separately)
- Long-term – Consider more robust mortality changes, including, if appropriate, new table development



3

# Overview of Process and Progress

## Process

- Subgroups of the SOA's Individual Annuity Experience Committee (IAEC) have been meeting since late 2021 on a bi-weekly basis
- Three subgroups were established to address three distinct individual annuity product lines – fixed deferred annuities, payout annuities, and structured settlement annuities
- Another subgroup, made up of members of the SOA's Group Annuity Experience Committee (GAEC), is preparing the recommendation for group annuities
- Each of the subgroups have had active American Academy of Actuaries participation

## Progress Update

- Fixed Deferred Annuities – the mortality adjustment factors we developed have been endorsed by the VM-22 SPA Mortality Assumption Drafting Group
- Individual Payout Annuities – the mortality adjustment factors we developed have been endorsed by the VM-22 SPA Mortality Assumption Drafting Group. However, we are close to completion of a new industry study, and expect to have the results in early 2023. Due to the timing of this new study, and with the delay of the field test (later than originally projected), we decided to develop updated adjustment factors to reflect the more recent experience.
- Structured Settlement Annuities – we are close to the finish line here, and expect to be able to present our proposal to the VM-22 SPA Mortality Assumption Drafting Group soon
- Group Annuities – a proposal is scheduled to be presented to the VM-22 SPA Mortality Assumption Drafting Group on Nov. 4



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## Fixed Deferred Annuities (FDAs)

- Adjustment Factors applied to 2012 IAM Table based on SOA Industry Deferred Annuity Mortality Study (2011-2015)
  - Includes both Traditional Fixed Rate Annuities and Fixed Indexed Annuities (FIAs)
  - Development of factors for Fixed Deferred Annuities *without* Guaranteed Living Benefits (GLBs) were based on study results
  - Development of factors for Fixed Deferred Annuities *with* GLBs were based on Variable Annuity study results (ratios taken between VAs with and without GLBs), since concentration and credibility issues negated the ability to use the DFA with GLB experience)
- Application of Historical Mortality Improvement to bring the factors up through 12/31/2021
- Future Mortality Improvement recommendation



## Base Adjustment Factors for Fixed Deferred Annuities

Base Mortality Adjustment Factors						
Age	Central Age	FDAs without GLBs		GLB/Non-GLB	FDAs with GLBs	
		Female	Male	Ratios from Vas	Female	Male
<50		150%	105%	<b>100%</b>	150%	105%
50-54	52	150%	105%	<b>100%</b>	150%	105%
55-59	57	125%	100%	<b>95%</b>	120%	95%
60-64	62	105%	85%	<b>84%</b>	90%	70%
65-69	67	105%	90%	<b>83%</b>	90%	75%
70-74	72	115%	95%	<b>83%</b>	95%	80%
75-79	77	115%	95%	<b>83%</b>	95%	80%
80-84	82	110%	100%	<b>89%</b>	95%	90%
85-89	87	100%	105%	<b>94%</b>	95%	100%
90-94	92	105%	105%	<b>94%</b>	100%	100%
95-99	97	105%	110%	<b>93%</b>	100%	100%
100-104	102	100%	100%	<b>100%</b>	100%	100%
105+		100%	100%	<b>100%</b>	100%	100%



# Development of Basis for Historical Mortality Improvement for FDAs

- Base mortality centered on mid-2013, the mid-point of the 2011-2015 study, needs to be brought up to the end of 2021
- Split the historical era into two periods, first through 2019, and then 2020-2021 covering the COVID pandemic period
- Historical Mortality Improvement through 2019
  - We used data from the SOA's report on Mortality by Socioeconomic Category, authored by Magali Barbieri, to generate improvement rates by quinquennial age groups
  - U.S. counties were assigned to one of ten deciles, based on various socioeconomic criteria
  - The 10<sup>th</sup> decile (highest socioeconomic category) aligned best with this population
  - Mortality data for this study was sourced from the National Center for Health Statistics (NCHS), which had a fairly good alignment with Social Security data except at older ages (above age 80)

# Development of Basis for Historical Mortality Improvement for FDAs, continued

- Historical Mortality Improvement for 2020 and 2021
  - Objective is to set a new baseline as of 12/31/2021, to be the new “jumping-off” point for mortality projections
  - Actual experience was obviously severely impacted by the pandemic
  - Even if specific COVID-related deaths could be identified with precision and factored out, other aspects of the pandemic environment affected overall mortality drivers
- Decided to use 50% of average annual 2013-2019 experience, floored at 0% if/where negative improvement occurred
  - This was based on the assumption that progress was made during the 2020-2021 period on some of the more significant drivers of mortality improvement, albeit at a lower level than would have occurred without the pandemic

# Historical Mortality Improvement Proposal

Age	G2 Improvement Rates		Improvement Rates for 2013 to 2019		Improvement Rates for 2020 and 2021	
	F	M	F	M	F	M
50	1.00%	1.00%	1.51%	0.95%	0.76%	0.48%
51	1.00%	1.10%	1.51%	1.10%	0.76%	0.55%
52	1.10%	1.10%	1.51%	1.25%	0.76%	0.63%
57	1.20%	1.40%	1.00%	1.05%	0.50%	0.53%
62	1.30%	1.50%	0.97%	0.68%	0.49%	0.34%
67	1.30%	1.50%	1.39%	0.45%	0.70%	0.23%
72	1.30%	1.50%	1.30%	0.69%	0.65%	0.35%
77	1.30%	1.50%	0.98%	0.80%	0.49%	0.40%
82	1.20%	1.30%	0.83%	0.78%	0.42%	0.39%
87	0.80%	0.90%	0.55%	0.54%	0.28%	0.27%
92	0.50%	0.60%	0.35%	0.36%	0.18%	0.18%
97	0.30%	0.30%	0.21%	0.18%	0.11%	0.09%
102	0.10%	0.10%	0.07%	0.06%	0.04%	0.03%



## FDA without GLB Adjustment Factors with Historical Mortality Improvement compared to Existing Basis

Age	FDA non-GLB Base Mortality Adjustment Factors		G2 Improvement Rates		Mortality Improvement Rates for 2013 to 2019		Mortality Improvement Rates for 2020 and 2021		FDA non-GLB Mortality Rates Projected to 12/31/2021 as % of Mort Rates Projected with G2		<u>Attribution Analysis</u>			
	F	M	F	M	F	M	F	M	F	M	FDA non-GLB Base Mortality Adjustment Factors		Impact of MI as Compared to G2	
50	150%	105%	1.00%	1.00%	1.51%	0.95%	0.76%	0.48%	145.8%	106.5%	150%	105%	97.2%	101.4%
51	150%	105%	1.00%	1.10%	1.51%	1.10%	0.76%	0.55%	145.8%	106.2%	150%	105%	97.2%	101.1%
52	150%	105%	1.10%	1.10%	1.51%	1.25%	0.76%	0.63%	147.0%	105.0%	150%	105%	98.0%	100.0%
57	125%	100%	1.20%	1.40%	1.00%	1.05%	0.50%	0.53%	128.5%	104.1%	125%	100%	102.8%	104.1%
62	105%	85%	1.30%	1.50%	0.97%	0.68%	0.49%	0.34%	109.1%	91.8%	105%	85%	103.9%	108.0%
67	105%	90%	1.30%	1.50%	1.39%	0.45%	0.70%	0.23%	105.7%	98.9%	105%	90%	100.6%	109.9%
72	115%	95%	1.30%	1.50%	1.30%	0.69%	0.65%	0.35%	116.5%	102.5%	115%	95%	101.3%	107.9%
77	115%	95%	1.30%	1.50%	0.98%	0.80%	0.49%	0.40%	119.4%	101.7%	115%	95%	103.8%	107.1%
82	110%	100%	1.20%	1.30%	0.83%	0.78%	0.42%	0.39%	114.5%	105.4%	110%	100%	104.1%	105.4%
87	100%	105%	0.80%	0.90%	0.55%	0.54%	0.28%	0.27%	102.7%	108.9%	100%	105%	102.7%	103.7%
92	105%	105%	0.50%	0.60%	0.35%	0.36%	0.18%	0.18%	106.7%	107.6%	105%	105%	101.6%	102.4%
97	105%	110%	0.30%	0.30%	0.21%	0.18%	0.11%	0.09%	106.0%	111.3%	105%	110%	101.0%	101.2%
102	100%	100%	0.10%	0.10%	0.07%	0.06%	0.04%	0.03%	100.3%	100.4%	100%	100%	100.3%	100.4%



# FDA with GLB Adjustment Factors with Historical Mortality Improvement compared to Existing Basis

Age	FDA with GLB Base Mortality Adjustment Factors		G2 Improvement Rates		Mortality Improvement Rates for 2013 to 2019		Mortality Improvement Rates for 2020 and 2021		FDA with GLB Mortality Rates Projected to 12/31/2021 as % of Mort Rates Projected with G2		<b>Attribution Analysis</b>			
	F	M	F	M	F	M	F	M	F	M	FDA with GLB Base Mortality Adjustment Factors		Impact of MI as Compared to G2	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
50	150%	105%	1.00%	1.00%	1.51%	0.95%	0.76%	0.48%	145.8%	106.5%	150%	105%	97.2%	101.4%
51	150%	105%	1.00%	1.10%	1.51%	1.10%	0.76%	0.55%	145.8%	106.2%	150%	105%	97.2%	101.1%
52	150%	105%	1.10%	1.10%	1.51%	1.25%	0.76%	0.63%	147.0%	105.0%	150%	105%	98.0%	100.0%
57	120%	95%	1.20%	1.40%	1.00%	1.05%	0.50%	0.53%	123.3%	98.9%	120%	95%	102.8%	104.1%
62	90%	70%	1.30%	1.50%	0.97%	0.68%	0.49%	0.34%	93.5%	75.6%	90%	70%	103.9%	108.0%
67	90%	75%	1.30%	1.50%	1.39%	0.45%	0.70%	0.23%	90.6%	82.4%	90%	75%	100.6%	109.9%
72	95%	80%	1.30%	1.50%	1.30%	0.69%	0.65%	0.35%	96.3%	86.4%	95%	80%	101.3%	107.9%
77	95%	80%	1.30%	1.50%	0.98%	0.80%	0.49%	0.40%	98.6%	85.6%	95%	80%	103.8%	107.1%
82	95%	90%	1.20%	1.30%	0.83%	0.78%	0.42%	0.39%	98.9%	94.9%	95%	90%	104.1%	105.4%
87	95%	100%	0.80%	0.90%	0.55%	0.54%	0.28%	0.27%	97.6%	103.7%	95%	100%	102.7%	103.7%
92	100%	100%	0.50%	0.60%	0.35%	0.36%	0.18%	0.18%	101.6%	102.4%	100%	100%	101.6%	102.4%
97	100%	100%	0.30%	0.30%	0.21%	0.18%	0.11%	0.09%	101.0%	101.2%	100%	100%	101.0%	101.2%
102	100%	100%	0.10%	0.10%	0.07%	0.06%	0.04%	0.03%	100.3%	100.4%	100%	100%	100.3%	100.4%



## Future Mortality Improvement Assumption

- Recommend the continued use of the G2 Improvement Scale for all Individual Annuity product lines
  - It is widely accepted in the industry
  - There's not a sufficiently compelling reason to move away from it at this time
  - Development of a new scale will require a thorough analysis that would be better suited for the longer-term update objective



# Development of Base Factors for Payout Annuities

- Based on SOA’s published study covering the 2009-2013 experience period, using Amount-based results (as versus Count-based results)
- Experience compared to the 2012 Individual Annuity Mortality (IAM) Basic table with Improvement Scale G2
- Payout Annuities include
  - Single Premium Immediate Annuities (SPIAs)
  - Deferred Income Annuities (DIAs)
  - Annuitizations of Deferred Annuities, including exercise of Guaranteed Minimum Income Benefits (GMIBs)
  - Life Annuity Settlement Options from Life Insurance policies
- Decision made to develop one set of factors for Payout Annuities
  - Assessment was that any greater granularity wasn’t warranted
  - Combining similar liability types allows for greater credibility of data



# Base Adjustment Factors for Payout Annuities

Base Mortality Adjustment Factors			
Age	Central Age	Female	Male
<50		150%	150%
50-54	52	150%	150%
55-59	57	150%	150%
60-64	62	100%	110%
65-69	67	95%	110%
70-74	72	95%	106%
75-79	77	100%	106%
80-84	82	100%	106%
85-89	87	102%	108%
90-94	92	110%	108%
95-99	97	110%	108%
100-104	102	100%	100%
105+		100%	100%





# Development of Basis for Historical Mortality Improvement for Payout Annuities

- Follows the same methodology as was used for Fixed Deferred Annuities, using the SOA’s report on Mortality by Socioeconomic Category
- Base mortality centered on mid-2011, the mid-point of the 2009-2013 study, thus it needed to be brought up to the end of 2021
- As the case with Fixed Deferred Annuities, the 10<sup>th</sup> decile (highest socioeconomic category) aligned with the Payout Annuity population, based on the mortality experience from the 2009-2013 industry study
- For the 2020-2021 pandemic period, we followed the same methodology as was used for FDAs (i.e. using 50% of the average annual 2011-2019 experience, floored at 0% if/where negative improvement occurred)



## Historical Mortality Improvement Proposal

Age	G2 Improvement Rates		Improvement Rates for 2011 to 2019		Improvement Rates for 2020 and 2021	
	F	M	F	M	F	M
50	1.00%	1.00%	1.56%	1.12%	0.78%	0.56%
51	1.00%	1.10%	1.54%	1.22%	0.77%	0.61%
52	1.10%	1.10%	1.51%	1.34%	0.76%	0.67%
57	1.20%	1.40%	0.94%	1.06%	0.47%	0.53%
62	1.30%	1.50%	1.03%	0.67%	0.52%	0.34%
67	1.30%	1.50%	1.51%	0.62%	0.76%	0.31%
72	1.30%	1.50%	1.48%	0.93%	0.74%	0.47%
77	1.30%	1.50%	1.21%	1.06%	0.61%	0.53%
82	1.20%	1.30%	0.92%	1.04%	0.46%	0.52%
87	0.80%	0.90%	0.62%	0.72%	0.31%	0.36%
92	0.50%	0.60%	0.38%	0.48%	0.19%	0.24%
97	0.30%	0.30%	0.23%	0.24%	0.12%	0.12%
102	0.10%	0.10%	0.08%	0.08%	0.04%	0.04%
103	0.10%	0.10%	0.08%	0.08%	0.04%	0.04%
104	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%



## Payout Annuities Adjustment Factors with Historical Mortality Improvement compared to Existing Basis

Age	Payout Annuities Base Mortality Adjustment Factors		G2 Improvement Rates		Mortality Improvement Rates for 2011 to 2019		Mortality Improvement Rates for 2020 and 2021		Payout Annuities Mortality Rates Projected to 12/31/2021 as % of Mort Rates Projected with G2		<b>Attribution Analysis</b>			
	F	M	F	M	F	M	F	M	F	M	Payout Annuities Base Mortality Adjustment Factors		Impact of MI as Compared to G2	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
50	150%	150%	1.00%	1.00%	1.56%	1.12%	0.78%	0.56%	143.6%	149.8%	150%	150%	95.7%	99.9%
51	150%	150%	1.00%	1.10%	1.54%	1.22%	0.77%	0.61%	143.9%	149.9%	150%	150%	95.9%	100.0%
52	150%	150%	1.10%	1.10%	1.51%	1.34%	0.76%	0.67%	145.8%	148.2%	150%	150%	97.2%	98.8%
57	150%	150%	1.20%	1.40%	0.94%	1.06%	0.47%	0.53%	155.7%	157.2%	150%	150%	103.8%	104.8%
62	100%	110%	1.30%	1.50%	1.03%	0.67%	0.52%	0.34%	104.0%	120.9%	100%	110%	104.0%	109.9%
67	95%	110%	1.30%	1.50%	1.51%	0.62%	0.76%	0.31%	94.3%	121.5%	95%	110%	99.3%	110.5%
72	95%	106%	1.30%	1.50%	1.48%	0.93%	0.74%	0.47%	94.6%	113.7%	95%	106%	99.6%	107.2%
77	100%	106%	1.30%	1.50%	1.21%	1.06%	0.61%	0.53%	102.2%	112.3%	100%	106%	102.2%	105.9%
82	100%	106%	1.20%	1.30%	0.92%	1.04%	0.46%	0.52%	104.0%	110.1%	100%	106%	104.0%	103.9%
87	102%	108%	0.80%	0.90%	0.62%	0.72%	0.31%	0.36%	104.6%	110.9%	102%	108%	102.6%	102.7%
92	110%	108%	0.50%	0.60%	0.38%	0.48%	0.19%	0.24%	111.8%	109.9%	110%	108%	101.7%	101.8%
97	110%	108%	0.30%	0.30%	0.23%	0.24%	0.12%	0.12%	111.1%	108.9%	110%	108%	101.0%	100.9%
102	100%	100%	0.10%	0.10%	0.08%	0.08%	0.04%	0.04%	100.3%	100.3%	100%	100%	100.3%	100.3%



## Payout Annuity Mortality Adjustment Factors – Impact of New Industry Study

- The SOA is currently conducting a Payout Annuity mortality study covering the period 2014-2019
- We would like to consider whether the results of the new study warrant updating the Payout Annuity adjustment factors, with an expectation that we will have a verdict (and possibly updated factors) by early 2023





Draft: 11/30/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
October 12, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Oct. 12, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Heard a Presentation on VM-22 SPA PB Assumptions

Tsang walked through a presentation (Attachment Twenty-Four-A) of the activities of the VM-22 Standard Projection Amount (SPA) Policyholder Behavior (PHB) Assumptions Drafting Group. Carmello asked whether experience from the 1980s and 1990s was considered when determining the dynamic lapse assumptions. Tsang noted that the Drafting Group considered that data but felt that it was too outdated to be used in the development of the current dynamic lapse assumption. John R. Miller (American Equity Investment Life Insurance Company) said sensitivity analysis could be provided on the dynamic lapse formula to illustrate how the results could change with different lapse parameters.

Brian Bayerle (American Council of Life Insurers—ACLI) asked for a rationale behind the approach to developing PHB assumptions using the VM-21, Requirements for Principle-Based Reserves for Variable Annuities, SPA as a starting point and blending in new experience data. Tsang noted that the Drafting Group was looking for consistency with VM-21. Carmello noted that the withdrawal assumptions are based on fixed-indexed annuities, and he asked if there is any plan to get data for vanilla fixed annuities. Tsang noted that data for vanilla fixed annuities should be available by the end of 2022, and separate withdrawal assumptions may be developed between fixed-indexed annuities and vanilla fixed annuities.

Carmello noted that for multi-year guaranteed annuities (MYGAs), if the market value adjustment (MVA) is based on treasury rates, then it may not be effective to mitigate disintermediation risk during a time when corporate spreads are increasing; therefore, should be subject to the dynamic lapse formula. Miller noted that he agrees that to the extent the MVA is not effective, MYGAs should be subject to the dynamic lapse formula.

Having no further business, the VM-22 (A) Subgroup adjourned

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/10 12/10\_12 VM-22 Minutes.docx

# VM-22 Standard Projection Amount (SPA) P/H Behavior (PHB) Assumptions Update

VM-22 SPA PHB Assumption  
Drafting Group

3/14/2022

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## Drafting Group and our objective

- The 12 members of the VM-22 SPA PHB Assumptions Drafting Group (DG) comprises regulators (IA, CA and IL) and representatives from the life industry, NAIC and LIMRA.
- Except for holidays and special events, the DG conducts weekly meetings since September 2021.
- Our objective is to develop a **strawman** of PHB assumptions (i.e., except mortality) for estimating the SPA of annuity contracts covered by the proposed VM-22.

3/14/2022

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## Level of Details and Product Categories

- Determining whether the VM-22 SPA is a reserve floor or a disclosure item is beyond our scope. It may be determined by VM-22 Subgroup based on the results of the field test.
  - If it is a reserve floor, the PHB assumptions should be more detail oriented.
  - If it is a disclosure item, the PHB assumptions could be at a high level.
- The current target is to develop PHB assumptions for fixed annuities (FA), fixed indexed annuities (FIA), with or w/o guaranteed living benefit (GLB).
- Indexed Linked Variable Annuities (ILVA) was determined to be out of our scope and should be covered under VM-21.
- MYGA is grouped with FA. If we have time, we may develop specific PHB assumptions for MYGA.
- Distribution channel can also be a factor for PHB assumptions.

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## Approaches for Developing PHB Assumptions

- Three approaches were discussed:
  - A. Use VM-21 SPA's actuarial assumptions as a starting point (a priori). By means of credibility theory or other methods to blend the SoA/LIMRA general account annuity experience data with VM-21 SPA assumptions to form the initial set of PHB assumptions (posterior).
  - B. Directly use SoA/LIMRA experience data to develop the initial set of actuarial PHB assumptions.
  - C. Develop a new method, other than those used for VM-21 or other valuation manual, to derive the initial set of actuarial assumptions.
- Approach A was chosen as the initial approach.
- For certain assumptions such as surrender, we may use SoA/LIMRA data to validate and modify assumptions developed by other sources.

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# Valuation Methods and Inventory of PHB Assumptions

- To be consistent with VM-21, the DG assumes both valuation methods (Company Specific Market Path and CTE with Prescribed Assumptions) specified in VM-21 for SPA are also applicable valuation methods for VM-22 SPA.
- The PHB assumptions for VM-22 SPA are listed below:
  - Assignment of VM-22 product types (FA/MYGA, FIA)
  - Maintenance expenses – not covered by LIMRA database
  - Guaranteed actuarial present value (GAPV)
  - Partial withdraw
  - Withdraw Delay Cohort – it was later determined to be too complicated and was not retained
  - Full surrender
  - Annuitization
  - Account transfers and future deposits
  - Account value depletion
  - Other voluntary terminations
  - Dynamic surrender and withdraw (not mentioned in VM-21) – sensitivity parameters, crediting rate, competitor rate
  - Base and dynamic GLB utilization (not mentioned in VM-21)

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## Crediting rate, competitor rate and dynamic parameters(1)

- With respect to crediting rate and competitor rate, there is no experience data suitable across the life industry.
- The practices for setting competitor rate or crediting rate floor should be included in an actuarial practice note rather the Valuation Manual.
- It is decided that this DG will not develop their exact definitions. Instead, this DG will
  - a. Allow qualified actuary to use his/her professional judgement to set the assumed crediting rate and competitor rate for the VM-22 stochastic reserve and use them for the VM-22 SPA
  - b. Require companies to provide detail documentation to justify these two assumptions
  - c. Incorporate dynamic lapse/PW parameters to reflect the diff between crediting/competitor rates
  - d. Provide guardrails for crediting rate and competitor rates, during and after the SC period
  - e. Use company's supporting documents for the assumptions to identify outliers for further scrutiny
  - f. The reasonableness of these assumed crediting and competitor rates should be reflected in the modeling of assumed surrender rates (base lapse rate and dynamic lapse)
  - g. There should be a limit on the PV of future investment spreads (not future profits) to avoid companies abuse the system by assuming significant annual investment spreads (e.g., 5%) between future earned rates and crediting rates. The PV of future investment spreads is calculated using VM-20 Scenario #9 "Baseline Scenario – All Shocks are Zero." This should be a part of the required documentation in (b).

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# Crediting rate, competitor rate and dynamic parameters (2)

- For FIA, the option budget is the assumed crediting rate for quantifying the investment spread between the net portfolio earned rate and the crediting rate.
- With respect to setting limit on the spread between the net portfolio earned rate and the crediting rate, DG proposes that
  - a. The maximum annual spread to be [2.25%] for policies without initial bonus.
  - b. For policies with initial bonus of [B%], the maximum annual spread is [2.25%] + [B%]/SCP during the surrender charge period (SCP). The maximum annual spread is reduced back to [2.25%] after the SCP.
  - c. The extra maximum annual spread [B%]/SCP allows the insurer to recapture the initial bonus via higher spread during the SCP.
  - d. If the proposed maximum annual spreads noted in (a) and (b) are adopted, an insurer may ask the regulators in its state of domicile for special permission if the insurer can justify the exception. As it can create non-uniform practices among states, such permission should only be granted with strong supports and may be scrutinized by VAWG. In other words, granting such permission should be a rare event.

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# Product groups and their assumptions

- There will be PHB assumptions for FIA and FA/MYGA.
- There will be no specific PHB assumptions for two-tier annuities due to immaterial amount of new business.
- There will be no PHB assumptions for payout annuities (e.g., pension risk transfer (PRT), SPIA, DIA, Structured Settlements contracts) due to lack of policyholder flexibilities (e.g., surrender or PW). Mortality is the key assumption for these payout annuities.
- An insurer may use its own retirement age assumption for PRT stochastic reserve as an assumption for VM-22 SPA. If there are credible experience data, we may develop appropriate guardrails for the retirement age assumption in the future.
- The effect of market value adjustment (MVA) should be incorporated into dynamic lapse formula.
- For annuities with both FA and FIA features, the general principle is to define whether the contract is FA/FIA in accordance with the classification of the base contract.
- GLB is the most common rider for FA and FIA. GLB and LTC riders may affect PHB.
- If there is no credible experience data for certain innovative riders, companies should incorporate margins into their PHB assumptions for annuities with such innovative riders.

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# Withdraw, annuitization and other minor assumptions

- **Withdraw assumptions**
  - Currently, VM-21 SPA has a special provision for withdraw cohort which may not be applicable for general account deferred annuities (FA and FIA).
  - DG will look at the LIMRA data first and try to keep it simple before considering a more complicated withdraw assumption.
- **Annuitization assumptions**
  - The industry’s experience on annuitization is that the utilization rate is minimal (10-15bp).
  - Due to its immateriality, DG will not prescribe the annuitization assumption.
  - Companies may use their own annuitization assumptions for stochastic reserve as the assumptions for SPA.
- **Maintenance expense, AV transfers, future deposits, AV depletion and other voluntary terminations are considered immaterial.**
  - For these minor assumptions, companies may use their own assumptions for stochastic reserve as assumptions for SPA.

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## Withdraw Assumptions(1)

The proposed VM-22 SPA withdraw assumptions follow the format of VM-21 SPA withdraw assumptions.

- For FA/FIA, either prior to exercising the GLB or FA/FIA without GLB, the partial withdrawal amount each year shall equal the following percentages of AV, based on the contract holder’s attained age:

Attained Age	With GLB; % of AV	W/O GLB; % of AV
59 and under	[1.50%]	[2.25%]
60-69	[1.75%]	[2.75%]
70-74	[3.75%]	[4.50%]
75+	[4.25%]	[4.50%]

- For FA/FIA contracts with GLB and account values of zero, the partial withdrawal amount shall be the guaranteed maximum annual withdrawal amount.
- Numbers quoted in brackets [ ] are based on the recent LIMRA collected data for FIA and are subject to change.

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## Withdraw Assumptions(2)

- For FA/FIA contracts with GLBs or hybrid GMIBs, that, in the contract year immediately preceding the valuation date, withdrew a non-zero amount not in excess of GMWB’s guaranteed withdrawal amount or the GMIB’s dollar-for-dollar maximum withdrawal amount, the partial withdrawal amount shall be [100%] of the guaranteed annual withdrawal amount or the GMIB’s dollar-for-dollar maximum withdrawal amount each year until the contract’s account value reaches zero.
- For other FA/FIA contracts with lifetime GMWBs or hybrid GMIBs, partial withdrawals shall be projected to commence pursuant to the Company’s own prudent best estimate assumptions, but ensuring that, at a minimum, GMWB or hybrid GMIB utilization rates in aggregate, measured by benefit base under Path A (replicating 70CTE), are at least as high as the utilization rates shown in the table below. Once GMWB or hybrid GMIB withdrawals are projected to commence, the partial withdrawal amount shall be 100% of the guaranteed annual withdrawal amount or the GMIB’s dollar-for-dollar maximum withdrawal amount each year until the contract’s account value reaches zero.

Qualification Status	Before 65	65-70	71-75	76+
Non-Qualified	[12%]	[20%]	[30%]	[35%]
Qualified	[15%]	[40%]	[80%]	[95%]

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## Withdraw Assumptions (3)

- For FA/FIA contracts with Non-Lifetime GLBs that, in the contract year immediately preceding the valuation date, withdrew a non-zero amount not in excess of GMWB’s guaranteed withdrawal amount, the partial withdrawal amount shall be [70%] of the guaranteed annual withdrawal amount each year until the contract’s account value reaches zero.
- For other FA/FIA contracts with Non-Lifetime GMWBs, partial withdrawals shall be projected to commence pursuant to the Company’s own prudent best estimate assumptions but ensuring that, at a minimum, GMWB utilization rates in aggregate, measured by benefit base under Path A (replicating 70CTE), are at least as high as the utilization rates shown in the table below. Once GMWB or hybrid GMIB withdrawals are projected to commence, the partial withdrawal amount shall be [70%] of the GMWB’s guaranteed annual withdrawal amount each year until the contract value reaches zero.

Qualification	Before 65	65-70	70-75	76+
Non-Qualified	[12%]	[20%]	[30%]	[35%]
Qualified	[15%]	[40%]	[80%]	[95%]

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# Initial thoughts on surrender assumptions and In-the-Money (ITM)

For deferred annuity products, base lapse/ surrender rates are dynamically adjusted upward (or downward) when the actual credited rate is below (or above) the competitor rate. For deferred annuity products with a GLIB, base lapse/ surrender rates are further adjusted based on the ITM of the rider value. The proposed lapse formula is as follows:

$Total\ Lapse = (Base\ Lapse + Rate\ Factor) \times ITM\ Factor$ , where

$ITM = PV\ of\ GMWB \div Account\ Value$

$PV\ of\ GMWB = Annuity\ Factor \times GMWB\ Benefit$

$ITM\ Factor = 1$  if  $ITM \leq 1.25$

$ITM\ Factor = \left(\frac{1.25}{ITM}\right)^2$  if  $ITM > 1.25$

$Rate\ Factor = Market\ Factor \times Max(0, 1 - 5 \times SC\ Percentage) / 100$ , where

$Market\ Factor = -1.25 \times (CR - MR)^{2.5}$  if  $CR \geq MR$

$Market\ Factor = 0$  if  $MR > CR \geq [MR - BF]$

$Market\ Factor = 1.25 \times (MR - BF - CR)^{2.5}$  if  $CR < [MR - BF]$

$Minimum\ Lapse = 1\%$

$Maximum\ Lapse = 60\%; 90\%$  for MYGA at the end of the interest guaranteed period

- CR represents the crediting rate at the time of the projection.
- MR represents the market competitor rate at the time of the projection.
- BF represents a buffer factor where dynamic lapses do not occur

The final formula and parameters for FA/FIA will be adjusted in accordance with emerging experience.

## Data for setting surrender assumptions (1)

- DG has studied the most recent LIMRA surrender data for FIA/ FA and does not consider the data for FA to be very insightful. A new revised set of FA surrender data is needed.
- A new set of experience data for FA can be obtained by either (a) collecting a new set of data from the industry or (b) collecting the new experience data for FA via VM-51 requirements.
- An alternative is to discuss this data issue with the Academy (ARCWG) and its consultants, WTW. The goal is to determine whether the DG can leverage on the data collected by WTW or to evaluate whether the Academy's suggested surrender assumptions for SPA are viable.

## Data for setting surrender assumptions (2)

- DG decided to ask LIMRA to send out a mini-survey for FA which contains less data fields (20-22) and focuses on surrender data.
- Some detail data fields are not included in the survey with the following assumptions:
  - MVA is not subject to dynamic lapse as the market value adjustment eliminates interest-related lapses.
  - MVA period is the same as the surrender charge period.
  - GLB is not as prevalent in FA as in FIA. Thus, DG only wants a GLB indicator for each FA contract to differentiate whether GLB has material effects on FA surrender rates.
- Distribution channel remains as an important factor for surrender and is a required data field for the mini-survey.

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## Data for setting surrender assumptions (3)

- LIMRA indicates that the regular data survey for FIA has been sent to the participating companies earlier this year and expects responses in the next few months.
- The remaining task is to prepare the mini-survey for FA in the same format as the regular data survey for FIA and submit it to the participating companies.
- The proposed approach is to review WTW's surrender assumptions and use the collected data to validate or modify the formulae and parameters for FA and FIA.

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# Timing of the data collection

- The time schedules for FIA/FA PHB data are:
  - a. FIA
    - i. Received data from 18 companies with 9 companies' data being validated.
    - ii. LIMRA is working with the remaining companies to clarify or amend the received data.
    - iii. All companies' data should be validated by end of September 2022
    - iv. A preliminary set of data should be available by mid-Oct.
  - b. FA
    - i. A project oversight group was formed.
    - ii. Deadline for the receiving the data should be end of the end of 2022.
    - iii. After data validation, a preliminary set of PHB data should be available at the end of 1Q2023.
- DG is responsible to develop the pivot tables for LIMRA (by mid-July) to analyze the collected data.

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# Questions?



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Draft: 11/22/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
October 4, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Oct. 4, 2022. The following Subgroup members participated: Ben Slutsker, Chair, and Lei Rao-Knight (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA)

1. Discussed Including the Fixed Annuity PBR Exemption in the VM-22 Exposure

Brian Bayerle (American Council of Life Insurers—ACLI) provided a summary of the *Fixed Annuity PBR Exemption Draft* (Attachment Twenty-Five-A) being considered for inclusion in *VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities* draft (VM-22 Draft) (Attachment Twenty-Five-B). Slutsker noted that some of the larger considerations included the basis for defining the threshold for exemption, the level of the threshold, and certain types of guarantees that would be ineligible for exclusion. Chupp noted his concern with the threshold being based off of reserves net of reinsurance, stating that a company could avoid the requirements by entering into reinsurance agreements. In addition, some Subgroup members commented that the proposed threshold of \$3 billion of prior year reserves on non-variable annuities seemed fairly high and that an open question for the exposure should be whether a lower figure, such as \$500 million, is more appropriate. After much discussion, the Subgroup decided to include the fixed annuity principle-based reserving (PBR) exemption language in the next exposure of the VM-22 Draft, along with guidance notes to ask for feedback on some of the key considerations for the next exposure of the VM-22 Draft.

2. Discussed Revised Scope and Definitions Sections and the Inclusion of a VM-V Section in VM-22 Exposure

Slutsker discussed revisions to the VM-22 Draft, including: 1) the addition of principles to the scope; 2) additional definitions in VM-01, Definitions for Terms in Requirements; and 3) moving the Statutory Maximum Valuation Interest Rates for Income Annuities to a new VM-V section. Hearing no objections from the Subgroup to the revisions, they will be included in the next exposure of the VM-22 Draft.

3. Discussed Longevity Reinsurance

Slutsker noted that the Subgroup had received comments on a June exposure of a proposal for longevity reinsurance (Attachment Twenty-Five-C). Brent Dooley (American Academy of Actuaries—Academy) summarized the three major points of the Academy's comment letter (Attachment Twenty-Five-D): 1) the Academy does not support the establishment of a longevity reinsurance reserve category, and instead favors more of a principle-based approach; 2) the Academy would favor a gross premium approach and flooring reserves at zero at the category level rather than contract-level flooring of reserves; and 3) if the k-factor approach is used, it should be based off of current prudent estimate assumptions as opposed to locked in assumptions. Bayerle said that the ACLI largely agrees with the Academy's comments (Attachment Twenty-Five-E). Tricia Matson (Risk & Regulatory Consulting—RRC) summarized her comment letter (Attachment Twenty-Five-F) by noting support for the k-factor approach.

Eom thanked the commenters for their letters and noted that the k-factor approach could be consistent with the principle-based statutory framework that includes conservatism. She said that she is open to approaches that would allow for the assumptions behind the k-factor to be unlocked. However, she said this could present resource

issues for some companies. John Robinson (Society of Actuaries—SOA) noted that some commenters seemed to indicate that the text of the VM-22 Draft did not align with the principles that were laid out and asked if state insurance regulators would consider removing principles where there was a lack of alignment. Bayerle agreed with Robinson’s comments but did not think it would be necessary to change the principles for the next exposure of the VM-22 Draft. Eom said that additional changes in this direction could be considered in the next exposure.

#### 4. Exposed the VM-22 Draft

Yanacheak made a motion, seconded by Leung, to expose the VM-22 Draft for a 90-day public comment period ending Jan. 2, 2023. The motion passed unanimously.

Having no further business, the VM-22 (A) Subgroup adjourned

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/10 04/10\_04 VM-22 Minutes.docx

II – Reserve Requirements Subsection 2: Annuity Products (new item D)

D. Annuity PBR Exemption

1. A company meeting at least one of the conditions in Subsection 2.D.2 below may file a statement of exemption for annuity contracts or certificates, except for contracts or certificates in Subsection 2.D.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-22. If a company has no business issued directly or assumed during the current calendar year that would otherwise be subject to VM-22, a statement of exemption is not required. For a filed statement of exemption, the statement must be filed with the domiciliary commissioner prior to July 1 of that year certifying that at least one of the two conditions in Subsection 2.D.2 was met, and the statement of exemption must also be included with the NAIC filing for the second quarter of that year.

The domiciliary commissioner may reject such statement prior to Sept. 1 and require the company to follow the requirements of VM-22 for the annuity contracts or certificates covered by the statement.

If a filed statement of exemption is not rejected by the domiciliary commissioner, the filing of subsequent statements of exemption is not required as long as the company continues to qualify for the exemption; rather, ongoing statements of exemption for each new calendar year will be deemed to not be rejected, unless: 1) the company does not meet either condition in Subsection 2.D.2 below; 2) the contracts contain those in Subsection 2.D.3 below; or 3) the domiciliary commissioner contacts the company prior to Sept. 1 and notifies them that the statement of exemption is rejected. If any of these three events occur, then the statement of exemption for the current calendar year is rejected, and a new statement of exemption must be filed and not rejected in order for the company to exempt additional contracts or certificates. In the case of an ongoing statement of exemption, rather than include a statement of exemption with the NAIC filing for the second quarter of that year, the company should enter “SEE EXPLANATION” in response to the Annuity PBR Exemption supplemental interrogatory and provide as an explanation that the company is utilizing an ongoing statement of exemption.

2. Condition for Exemption:
  - a. The company has less than \$3 billion of exempted prior year reserves, and if the company is a member of an NAIC group that includes other life insurance companies, the group has combined exempted prior year reserves of less than \$6 billion: or
  - b. The only new contract or certificates that would otherwise be subject to VM-22 being issued or assumed by the company are due to election of contract benefits or features from existing contracts or certificates valued under VM-A and VM-C and the company was exempted from, or otherwise not subject to, the requirements of VM-22 in the prior year.

Exemption reserves are determined as follows:



- a. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 2 (“Fixed Annuities”), line 15; plus
  - b. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 3 (“Indexed Annuities”), line 15; plus
  - c. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuitizations)”), line 15; plus
  - d. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 2 (“Fixed Annuities”), line 15; plus
  - e. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 3 (“Indexed Annuities”), line 15; plus
  - f. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuitizations)”), line 15.
3. Contracts and Certificates Excluded from the Annuity PBR Exemption:
- a. Contracts or certificates with guaranteed living benefits (GMIBs, GMABs, GMMBs, GLWBs).
4. Each exemption, or lack of an exemption, outlined in Subsection 2.D.1 – Subsection 2.D.3 above applies only to contracts or certificates issued or assumed in the current year, and it applies to all future valuation dates for those contracts or certificates. However, if contracts or certificates did not qualify for the Annuity PBR Exemption during the year of issue but would have qualified for the Annuity PBR Exemption if the current Valuation Manual requirements had been in effect during the year of issue, then the domiciliary commissioner may allow an exemption for such contracts or certificates. The minimum reserve requirements for the annuity contracts and certificates subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality tables as defined in VM-M.

**Comment Categories:**

- Tier 1: Key Decision Points – Discuss first
- Tier 2: High Substance Edits – Discuss second
- Tier 3: Moderate Substance Edits – Discuss third
- Tier 4: Noncontroversial or Low Substance Edits – Will expose and only discuss upon comment

**VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities**

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## Valuation Manual Section II. Reserve Requirements

### Subsection 2: Annuity Products

- A. This subsection establishes reserve requirements for all contracts classified as annuity contracts as defined in SSAP No. 50 in the AP&P Manual.
- B. Minimum reserve requirements for variable annuity (VA) contracts and similar business, specified in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, shall be those provided by VM-21. The minimum reserve requirements of VM-21 are considered PBR requirements for purposes of the *Valuation Manual*.
- C. Minimum reserve requirements for non-variable annuity contracts issued prior to 1/1/2025 are those requirements as found in VM-A and VM-C as applicable, with the exception of the minimum requirements for the valuation interest rate for single premium immediate annuity contracts, and other similar contracts, issued after Dec. 31, 2017, including those fixed payout annuities emanating from host contracts issued on or after Jan. 1, 2017, and on or before Dec. 31, 2017. The maximum valuation interest rate requirements for those contracts and fixed payout annuities are defined in VM-V, Statutory Maximum Valuation Interest Rates for Formulaic Reserves.
- D. Minimum reserve requirements for non-variable annuity contracts issued on 1/1/2025 and later are those requirements as found in VM-22, with the exception of Guaranteed Investment Contracts, Synthetic Guaranteed Investment Contracts, and other stable value contracts which shall follow the requirements found in VM-A and VM-C.

The requirements in this section are still considered a part of PBR requirements and therefore are applicable to VM-G.

- E. Minimum reserve requirements Upon determining whether annuities fall under the requirements in paragraphs B, C, and D in this subsection, the below principles shall be followed:
  - 1. Contracts that do not guarantee the principal amount of purchase payments, net of any partial withdrawals, and interest credited thereto, less any deduction (without regard to its timing) for sales, administrative or other expenses or charges are generally expected to follow the requirements in Paragraph B of this subsection .
  - 2. Contracts that do not credit a rate of interest under the contract prior to the application of any market value adjustments that is at least equal to the minimum rate required to be credited by the standard nonforfeiture law in the jurisdiction in which the contract is issued are generally expected to follow the requirements in Paragraph B of this subsection.
  - 3. Contracts falling under the definition of Index-Linked Variable Annuities provided in VM-01 are generally expected to follow the requirements in Paragraph B of this subsection.
  - 4. All annuity contracts that do not fall under E.1, E.2, or E.3 in this subsection are generally expected to follow the requirements in Paragraph C or D of this subsection, in accordance with the date on which the contract has been issued.

### Minimum reserve requirements for index



Subsection 6: Riders and Supplemental Benefits

**Guidance Note:** Designs of policies or contracts with riders and supplemental benefits which are created to simply disguise benefits subject to the Valuation Manual section describing the reserve methodology for the base product to which they are attached, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs with similar riders.

- A. If a rider or supplemental benefit is attached to a health insurance product, deposit-type contract, or credit life or disability product, it may be valued with the base contract unless it is required to be separated by regulation or other requirements.
- B. For supplemental benefits on life insurance policies or annuity contracts, including Guaranteed Insurability, Accidental Death or Disability Benefits, Convertibility, or Disability Waiver of Premium Benefits, the supplemental benefit may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A, and/or VM-C, as applicable.
- C. ULSG and other secondary guarantee riders on a life insurance policy and any guaranteed minimum benefits on life insurance policies or annuity contracts including, but not limited to, Guaranteed Minimum Accumulation Benefits, Guaranteed Minimum Death Benefits, Guaranteed Minimum Income Benefits, Guaranteed Minimum Withdrawal Benefits, Guaranteed Lifetime Income Benefits, Guaranteed Lifetime Withdrawal Benefits, Guaranteed Payout Annuity Floors, Waiver of Surrender Charges, Return of Premium, Systematic Withdrawal Benefits under Required Minimum Distributions, and all similar guaranteed benefits shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.
- D. If a rider or supplemental benefit to a life insurance policy or annuity contract that is not addressed in Paragraphs B, C, or D above possesses any of the following attributes, the rider or supplemental benefit shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.
  - 1. The rider or supplemental benefit does not have a separately identified premium or charge.
  - 2. After issuance, the rider or supplemental benefit premium, charge, value or benefits are determined by referencing the base policy or contract features or performance.
  - 3. After issuance, the base policy or contract value or benefits are determined by referencing the rider or supplemental benefit features or performance. The deduction of rider or benefit premium or charge from the contract value is not sufficient for a determination by reference.
- E. If a term life insurance rider on the named insured[s] on the base life insurance policy does not meet the conditions of Paragraph E above, and either (1) guarantees level or near level premiums until a specified duration followed by a material premium increase; or (2) for a rider for which level or near level premiums are expected for a period followed by a material premium increase, the rider is separated from the base policy and follows the reserve requirements for term policies under VM20, VM-A and/or VM-C, as applicable.
- F. For all other riders or supplemental benefits on life insurance policies or annuity contracts not addressed in Paragraphs B through F above, the riders or supplemental benefits may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A and/or VM-C, as applicable. For a given rider, the election to

include riders or supplemental benefits with the base policy or contract shall be determined at the policy form level, not on a policy-by-policy basis, and shall be treated consistently from year-to-year, unless otherwise approved by the domiciliary commissioner.

Any supplemental benefits and riders offered on life insurance policies or annuity contracts that would have a material impact on the reserve (for VM-20 and VM-22) or TAR (for VM-21) if elected later in the contract life, such as joint income benefits, nursing home benefits, or withdrawal provisions on annuity contracts, shall be considered when determining reserves (for VM-20 and VM-22) or reserves and TAR (for VM-21). The company must assume that policyholders' and contract holders' efficiency will increase over time unless the company has relevant and credible experience or clear evidence to the contrary. For example, policyholders with living benefits and annuitization in the same contract may generally use the more valuable of the two benefits.



#### VM-01: Definitions for Terms in Requirements

- The term “Deferred Income Annuity” (DIA) means an annuity contract that guarantees a periodic payment for the life of the annuitant or a term certain and payments begin 13 months or later from the issue date if the contract holder survives to a predetermined future age.
- The term Guaranteed Investment Contract (GIC) means an accumulation-based group annuity contract issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.
- The term “Guaranteed Minimum Accumulation Benefit” (GMAB) means a guaranteed benefit providing, or resulting in the provision, that an amount payable on the contractually determined maturity date of the benefit will be increased and/or will be at least a minimum amount. Only such guarantees having the potential to produce a contractual total amount payable on benefit maturity that exceeds the account value, or in the case of an annuity providing income payments, an amount payable on benefit maturity other than continuation of any guaranteed income payments, are included in this definition.
- The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:
  - Increased by an amount that may be either specified by or computed from other policy or contract values; and
  - Contains either:
    - The potential to produce a contractual total amount payable on such death that exceeds the account value, or
    - In the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.
- The term “guaranteed minimum income benefit” (GMIB) means an option under which the contractholder has the right to apply a specified minimum amount that could be greater than the amount that would otherwise be available in the absence of such benefit to provide periodic income using a specified purchase basis.
- The term “Index Credit” means any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to contract values that is linked to an index or indices. Amounts credited to the contract resulting from a floor on an index account are included.
- The term “Index Credit Hedge Margin” means a margin capturing the risk of inefficiencies in the company’s hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions

- The term “Index Crediting Strategies” means strategies defined in a contract to determine index credits for a contract. For example, this may refer to underlying index, index parameters, date, timing, performance triggers, and other elements of the crediting method.
- The term “Index-Linked Variable Annuity” (ILVA) means an annuity contract with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, in addition to downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.
- The term “Longevity Reinsurance” means an agreement or reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.
  - The reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.
  - Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular, contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.
- The term “Pension Risk Transfer” (PRT) means an annuity, either a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).
- The term “Single Premium Immediate Annuity” (SPIA) means an annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months from the issue date.
- The term “Stable Value Contracts” means accumulation-based group contracts that provide limited investment guarantees, preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios may consist of fixed income securities, which may sit in the insurer’s general account, a separate account, or in a third-party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.
- The term “Structured Settlement Contracts” are defined as annuity contracts that provide periodic benefits and purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes.

- The term “Synthetic Guaranteed Investment Contract” (SGIC) means contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the contract holder or plan trust.
- The term “Term Certain Payout Annuity” means an annuity contract that offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.

## Section 1: Background

### A. Purpose

These requirements establish the minimum reserve valuation standard for non-variable annuity contracts as defined in Section 2.A and issued on or after 1/1/2024. For all contracts encompassed by the Scope, these requirements constitute the Commissioners Annuity Reserve Valuation Method (CARVM) and, for certain contracts and certificates, the Commissioners Reserve Valuation Method (CRVM).

**Guidance Note:** CRVM requirements apply to some group pension contracts.

**Drafting Note:** There is a guidance note in VM-21 explains that the reserve projection requirements are generally consistent with RBC C-3 Phase II requirements. However, it was decided to exclude this guidance note from VM-22 for the time being, though this may be revisited depending on whether further updates are made to the C-3 Phase I capital framework.

### B. Principles

The projection methodology used to calculate the SR is based on the following set of principles. These principles should be followed when interpreting and applying the methodology in these requirements and analyzing the resulting reserves.

**Guidance Note:** The principles should be considered in their entirety, and it is required that companies meet these principles with respect to those contracts that fall within the scope of these requirements and are in force as of the valuation date to which these requirements are applied.

**Principle 1:** The objective of the approach used to determine the SR is to quantify the amount of statutory reserves needed by the company to be able to meet contractual obligations in light of the risks to which the company is exposed with an element of conservatism consistent with statutory reporting objectives.

**Principle 2:** The calculation of the SR is based on the results derived from an analysis of asset and liability cash flows produced by the application of a stochastic cash-flow model to equity return and interest rate scenarios. For each scenario, the greatest present value of accumulated deficiency is calculated. The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions and prescribed guardrails) to allow the natural offset of risks within a given scenario. The methodology uses a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model and sets the SR at a degree of confidence using the CTE measure applied to the set of scenario specific greatest present values of accumulated deficiencies that is deemed to be reasonably conservative over the span of economic cycles.

**Guidance Note:** Examples where full aggregation between contracts may not be possible include experience rated group contracts and the operation of reinsurance treaties.

**Principle 3:** The implementation of a model involves decisions about the experience assumptions and the modeling techniques to be used in measuring the risks to which the company is exposed. Generally, assumptions are to be based on the conservative end of the confidence interval. The choice of a conservative estimate for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the SR at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the SR, the company should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

**Guidance Note:** The intent of Principle 3 is to describe the conceptual framework for setting assumptions. Section 10 provides the requirements and guidance for setting contract holder behavior assumptions and includes alternatives to this framework if the company is unable to fully apply this principle. More guidance and requirements for setting assumptions in general are provided in Section 12.

**Principle 4:** While a stochastic cash-flow model attempts to include all real-world risks relevant to the objective of the stochastic cash-flow model and relationships among the risks, it will still contain limitations because it is only a model. The calculation of the SR is based on the results derived from the application of the stochastic cash-flow model to scenarios, while the actual statutory reserve needs of the company arise from the risks to which the company is (or will be) exposed in reality. Any disconnect between the model and reality should be reflected in setting prudent estimate assumptions to the extent not addressed by other means.

**Principle 5:** Neither a cash-flow scenario model can completely quantify a company's exposure to risk. A model attempts to represent reality but will always remain an approximation thereto and, hence, uncertainty in future experience is an important consideration when determining the SR. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve solely to reduce the calculated SR without also reducing risk on scenarios similar to those used in the actual cash-flow modeling are inconsistent with these principles. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit "foreknowledge" of the components of the required methodology.

C. Risks Reflected and Risks Not Reflected

1. The risks reflected in the calculation of reserves under these requirements arise from actual or potential events or activities that are both:
  - a. Directly related to the contracts falling under the scope of these requirements or their supporting assets; and

- b. Capable of materially affecting the reserve.
2. Categories and examples of risks reflected in the reserve calculations include, but are not necessarily limited to:
- a. Asset risks
    - i. Credit risks (e.g., default or rating downgrades).
    - ii. Commercial mortgage loan roll-over rates (roll-over of bullet loans).
    - iii. Uncertainty in the timing or duration of asset cash flows (e.g., shortening (prepayment risk) and lengthening (extension risk)).
    - iv. Performance of equities, real estate, and Schedule BA assets.
    - v. Call risk on callable assets.
    - vi. Separate account fund performance.

**Drafting Note:** Feedback welcome on whether to remove reference to separate accounts in VM-22. Whether references to separate accounts are retained or removed, consider making the treatment of such references consistent throughout VM-22.

- vii. Risk associated with hedge instrument (includes basis, gap, price, parameter estimation risks, and variation in assumptions).
  - viii. Currency risk.
- b. Liability risks
    - i. Reinsurer default, impairment, or rating downgrade known to have occurred before or on the valuation date.
    - ii. Mortality/longevity, persistency/lapse, partial withdrawal, and premium payment risks.
    - iii. Utilization risk associated with guaranteed living benefits.
    - iv. Anticipated mortality trends based on observed patterns of mortality improvement or deterioration, where permitted.
    - v. Annuitization risks.
    - vi. Additional premium dump-ins (high interest rate guarantees in low interest rate environments).
    - vii. Applicable expense risks, including fluctuation in maintenance expenses directly attributable to the business, future commission expenses, and expense inflation/growth.

- c. Combination risks
  - i. Risks modeled in the company’s risk assessment processes that are related to the contracts, as described above.
  - ii. Disintermediation risk (including such risk related to payment of surrender or partial withdrawal benefits).
  - iii. Risks associated with revenue-sharing income.
- 3. Categories and examples of risks not reflected in the reserve calculations include, but are not necessarily limited to:
  - a. Asset risks
    - i. Liquidity risks associated with a “run on the bank.”
  - b. Liability risks
    - i. Reinsurer default, impairment or rating downgrade occurring after the valuation date.
    - ii. Catastrophic events (e.g., epidemics or terrorist events).
    - iii. Major breakthroughs in life extension technology that have not yet altered recently observed mortality experience.
    - iv. Significant future reserve increases as an unfavorable scenario is realized.
  - c. General business risks
    - i. Deterioration of reputation.
    - ii. Future changes in anticipated experience (reparameterization in the case of stochastic processes), which would be triggered if and when adverse modeled outcomes were to actually occur.
    - iii. Poor management performance.
    - iv. The expense risks associated with fluctuating amounts of new business.
    - v. Risks associated with future economic viability of the company.
    - vi. Moral hazards.
    - vii. Fraud and theft.
    - viii. Operational.
    - ix. Litigation.

D. Materiality

The company shall establish a standard containing the criteria for determining whether an assumption, risk factor, or other element of the principle-based valuation has a material impact on the size of the reserve. This standard shall be applied when identifying material risks.

Section 2: Scope and Effective Date

A. Scope

Non-variable annuity contracts specified in VM Section II, Subsection 2 “Annuity Contracts”, Paragraph D are subject to VM-22 requirements.

B. Effective Date & Transition

**Effective Date**

These requirements apply for valuation dates on or after January 1, 2025.

**Transition**

A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-22 PBR requirements and issued during the first three years following the effective date of VM-22 PBR. If a company during the three-year transition period elects to apply VM-22 PBR to a block of such business, then a company must continue to apply the requirements of VM-22 PBR for future issues of this business. Irrespective of the transition date, a company shall apply VM-22 PBR requirements to applicable blocks of business on a prospective basis starting at least three years after the effective date.



### Section 3: Reserve Methodology

#### A. Aggregate Reserve

The aggregate reserve for contracts falling within the scope of these requirements shall equal the SR (following the requirements of Section 4) plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option, less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A and VM-C.

**Guidance Note:** Contracts valued under applicable requirements in VM-A and VM-C are ones that pass the exclusion test and elect to not model PBR SRs, per the requirements in Section 3.E.

#### B. Impact of Reinsurance Ceded

All components in the aggregate reserve shall be determined post-reinsurance ceded, that is net of any reinsurance cash flows arising from treaties that meet the statutory requirements that allow the treaty to be accounted for as reinsurance. A pre-reinsurance ceded reserve also needs to be determined by ignoring all reinsurance cash flows (costs and benefits) in the reserve calculation.

#### C. The Additional Standard Projection Amount

The additional standard projection amount is determined by applying one of the two standard projection methods defined in Section 6. The same method must be used for all contracts within a group of contracts that are aggregated together to determine the reserve. The company shall elect which method they will use to determine the additional standard projection amount. The company may not change that election for a future valuation without the approval of the domiciliary commissioner.

#### D. The SR

1. The SR shall be determined based on asset and liability projections for the contracts falling within the scope of these requirements, excluding those contracts valued using the methodology pursuant to applicable requirements in VM-A and VM-C, over a broad range of stochastically generated projection scenarios described in Section 8 and using prudent estimate assumptions as required in Section 3.G herein.
2. The SR amount for any group of contracts shall be determined as CTE70 of the scenario reserves following the requirements of Section 4.

#### E. The DR

The DR for groups of contracts for which a company elects the Deterministic Certification Option in Section 7.E shall be determined as the DR following the requirements of Section 4.

3. The reserve may be determined in aggregate across various groups of contracts within each Reserving Category as a single model segment when determining the SR.

#### F. Aggregation of Contracts for the DR and SR

Groups of contracts within different Reserving Categories may not be aggregated together in determining the SR or DR. For the purposes of VM-22, Reserving Categories are classified as the following:

- a. The “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities:
  - i. Single premium immediate annuity contracts;
  - ii. Deferred income annuity contracts;
  - iii. Structured settlements in payout or deferred status;
  - iv. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
  - v. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
  - vi. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;

<p><b>Drafting Note:</b> Additional feedback is welcome for whether to permit optionality for categorizing guaranteed living benefit contracts with depleted fund value as either in the payout or accumulation reserving category.</p>
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- vii. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
  - viii. Pension Risk Transfer Annuities; and
  - ix. Longevity Reinsurance.
- b. The “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category”.
4. Do not aggregate groups of contracts for which the company elects to use the Deterministic Certification Option in Section 7.E with any groups of contracts that do not use such option.
  5. To the extent that aggregation results in more than one model segment, the aggregate reserve shall equal the sum of the SR amounts computed for each model segment and DR amounts computed for each model segment for which the company elects to use the Deterministic Certification Option in Section 7.E.

#### G. Stochastic Exclusion Test

1. To the extent that certain groups of contracts pass the stochastic exclusion test in Section 7.B, these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, VM-C, and VM-V.
2. For dividend-paying contracts, a dividend liability shall be established following requirements in VM-A and VM-C, as described above, for the base contract.
3. The company may not group together contract types with significantly different risk profiles when performing the exclusion test.

#### H. Allocation of the Aggregate Reserve to Contracts

The aggregate reserve shall be allocated to the contracts falling within the scope of these requirements using the method outlined in Section 13, with the exception of contract following Section 3.E which are to be calculated on a seriatim basis.

#### I. Prudent Estimate Assumptions

1. With respect to the SR in Section 3.D, the company shall establish the prudent estimate assumption for each risk factor in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.

**Drafting Note:** Consider replacing “periodically” with “at least every 3 years in the paragraph above upon adoption of a similar APF for VM-20/VM-21.

2. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of the review indicate that previously anticipated experience for a given factor is inadequate, then the Company shall set a new, adequate, anticipated experience assumption for the factor.
3. To determine the prudent estimate assumptions, the SR shall also follow the requirements in Sections 4 and general assumptions including Section 9 for asset assumptions, Section 10 for contract holder behavior assumptions, Section 11 for mortality assumptions, and Section 12 for general guidance and expense assumptions.

#### J. Approximations, Simplifications, and Modeling Efficiency Techniques

A company may use simplifications, approximations, and modeling efficiency techniques to calculate the SR and/or the additional standard projection amount required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations, and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

**Guidance Note:**

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Examples of modeling efficiency techniques include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques or other similar simplifications.

There are multiple ways of providing the demonstration required by Section 3.H. The complexity of the demonstration depends upon the simplifications, approximations or modeling efficiency techniques used. Examples include, but are not limited to:

1. Rounding at a transactional level in a direction that is clearly and consistently conservative or is clearly and consistently unbiased with an obviously immaterial impact on the result (e.g., rounding to the nearest dollar) would satisfy 3.H without needing a demonstration. However, rounding to too few significant digits relative to the quantity being rounded, even in an unbiased way, may be material and in that event, the company may need to provide a demonstration that the rounding would not produce a material understatement of the reserve.
2. A brute force demonstration involves calculating the minimum reserve both with and without the simplification, approximation or modeling efficiency technique, and making a direct comparison between the resulting reserve. Regardless of the specific simplification, approximation or modeling efficiency technique used, brute force demonstrations always satisfy the requirements of Section 3.H.
3. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters and providing a detailed demonstration of why it did not understate the reserve by a material amount and the expected value of the reserve would not be less than the expected value of the reserve that would otherwise be calculated. This demonstration may be a theoretical, statistical or mathematical argument establishing, to the satisfaction of the insurance commissioner, general bounds on the potential deviation in the reserve estimate rather than a brute force demonstration.

**Drafting Note:** Add back in the WDCM method example in the above guidance note if VM-22 uses this method for the SPA calculation.

## Section 4: Determination of SR

### A. Projection of Accumulated Deficiencies

#### 1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9. The company shall project cash flows including the following:

- a. Gross premium received by the company from the contract holder (including any due premiums as of the projected start date).

<p><b>Guidance Note:</b> If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.</p>
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- b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses).

All material benefits projected to be paid to contract holders—including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

- c. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.
- d. Insurance company expenses (including overhead and maintenance expense), commissions and other acquisition expenses associated with business inforce as of the valuation date,.
- e. Cash flows associated with any reinsurance.
- f. Cash flows from hedging instruments as described in Section 4.A.4.
- g. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.
- h. If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.

**Guidance Note:** Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.1.b are before consideration of policy loans), less additional policy loan principal (but excluding policy loan interest that is added to the policy loan principal balance).

2. Grouping of Index Crediting Strategies

Index crediting strategies for non-variable annuities may be grouped for modeling using an approach that recognizes the objectives of each index crediting strategy. In assigning each index crediting strategy to a grouping for projection purposes, the fundamental characteristics of the index crediting strategy shall be reflected, and the parameters shall have the appropriate relationship to the stochastically generated projection scenarios described in Section 8. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

Index accounts sharing similar index crediting strategies may also be grouped for modeling to an appropriately crafted proxy strategy normally expressed as a linear combination of recognized market indices, sub-indices or funds, in order to develop the investment return paths and associated interest crediting. Each index crediting strategy's specific risk characteristics, associated index parameters, and relationship to the stochastically generated scenarios in Section 8 should be considered before grouping or assigning to a proxy strategy. Grouping and/or development of a proxy strategy may not be done in a manner that intentionally understates the resulting reserve.

3. Model Cells

Projections may be performed for each contract in force on the date of valuation or by assigning contracts into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Assigning contracts to model cells may not be done in a manner that intentionally understates the resulting reserve.

4. Modeling of Hedges

- a. For a company that does not have a future hedging strategy supporting the contracts:
  - i. The company shall not consider the cash flows from any future hedge purchases or any rebalancing of existing hedge assets in its modeling, since they are not included in the company's investment strategy supporting the contracts.
  - ii. Existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the starting assets.
- b. For a company that has one or more future hedging strategies supporting the contracts:

- i. For a hedging program with hedge payoffs that offset interest credits associated with indexed interest strategies (indexed interest credits):
  - a) In modeling cash flows, the company shall include the cash flows from future hedge purchases or any rebalancing of existing hedge assets that are intended solely to offset interest credits to contract holders.
  - b) Existing hedging instruments that are currently held by the company for offsetting the indexed credits in support of the contracts falling under the scope of these requirements shall be included in the starting assets. Existing hedging instruments that are currently held by the company not for offsetting the indexed credits should be modeled consistently with the requirements of Section 4.A.4.a.ii.
  - c) An Index Credit Hedge Margin for these hedge instruments shall be reflected by reducing index interest credit hedge payoffs by a margin multiple that shall be justified by sufficient and credible company experience and be no less than [X%] multiplicatively of the interest credited. This margin is intended to cover sources of potential error due the hedging itself and the ability for the company to accurately model it. In the absence of sufficient and credible company experience, a margin of [Y%] shall be assumed. There is no cap on the index credit hedge margin if company experience indicates actual error is greater than [Y%].
- ii. For a company with any future hedging strategies that hedge any contractual obligation or risks other than indexed interest credits, the detailed requirements for the modeling of hedges are defined in Section 9. The following requirements do not supersede the detailed requirements.
  - a) The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the projections used in the determination of the SR.
  - b) The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future. Because models do not always accurately portray the results of hedge programs, the company shall, through back-testing and other means, assess the accuracy of the hedge modeling. The company shall determine a SR as the weighted average of two CTE values; first, a CTE70 (“best efforts”) representing the company’s projection of all of the hedge cash flows, including future hedge purchases, and a second CTE70 (“adjusted”) which shall use only hedge assets held by the company on the valuation date and only future hedge purchases associated with indexed

interest credited. These are discussed in greater detail in Section 9. The SR shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E)I determined following the guidance of Section 9.C.4.

- c) Consistent with Section 4.A.4.b.i, if the company has an indexed credit hedging program, the index credit hedge margin for instruments associated with indexed interest credited shall be reflected by reducing hedge payoffs by a margin multiple as defined in Section 4.A.4.b.i.c in both the “best efforts” run and the “adjusted” run.
- d) The use of products not falling under the scope of VM-22 Section 1 through 13 requirements (e.g., variable annuities) (~~e.g., equity-indexed annuities~~) as a hedge shall not be recognized in the determination of accumulated deficiencies.

**Guidance Note:** Section 4.A.4.b.i is intended to address common situations for products with index crediting strategies where the company only hedges index credits or clearly separates index credit hedging from other hedging. In this case the hedge positions are considered similarly to other fixed income assets supporting the contracts, and a margin is reflected rather than modeling using a CTE70 adjusted run with no future hedge purchases. If a company has a more comprehensive hedge strategy combining index credits, guaranteed benefit, and other risks (e.g., full fair value or economic hedging), an appropriate and documented bifurcation method should be used in the application of sections 4.A.4.b.i and 4.A.4.b.ii above for the hedge modeling and justification. Such bifurcation methods may quantify the specific risk exposure attributable to index credit liabilities versus other liabilities such as guaranteed living benefits, and apply such for the basis for allocation.

**Guidance Note:** The requirements of Section 4.A.4 govern the determination of reserves for annuity contracts and do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

## 5. Revenue Sharing

If applicable, projections of accumulated deficiencies may include income from projected future revenue sharing, net of applicable projected expenses (net revenue-sharing income) by following the requirements set forth in VM-21 Sections 4.A.5.a through 4.a.5.f.

## 6. Length of Projections

Projections of accumulated deficiencies shall be run for as many future years as needed so that no obligations remain at the end of the projection periods.

## 7. Interest Maintenance Reserve (IMR)

The IMR shall be handled consistently with the treatment in the company’s cash flow testing, and the amounts should be adjusted to a pre-tax basis.



B. Determination of Scenario Reserve

1. For a given scenario, the scenario reserve shall be determined using one of two methods described below:
  - a) The starting asset amount plus the greatest present value, as of the projection start date, of the projected accumulated deficiencies; or

**Guidance Note:** The greatest present value of accumulated deficiencies can be negative.

- b) The direct iteration method, where the scenario reserve is determined by solving for the amount of starting assets which, when projected along with all contract cash flows, result in the defeasement of all projected future benefits and expenses at the end of the projection horizon with no positive accumulated deficiencies at the end of any projection year during the projection period.

The scenario reserve for any given scenario shall not be less than the cash surrender value in aggregate on the valuation date for the group of contracts modeled in the projection. In the case where assets supporting the liability are held at market value, the market value adjustment shall also be applied to the cash surrender value.

2. Discount Rates

In determining the scenario reserve, unless using the direct iteration method pursuant to Section 4.B.1.b, the accumulated deficiencies shall be discounted at the NAER on additional assets, as defined in Section 4.B.3.

3. Determination of NAER on Additional Invested Asset Portfolio

- a. The additional invested asset portfolio for a scenario is a portfolio of general account assets as of the valuation date, outside of the starting asset portfolio, that is required in that projection scenario so that the projection would not have a positive accumulated deficiency at the end of any projection year. This portfolio may include only (i) General Account assets available to the company on the valuation date that do not constitute part of the starting asset portfolio; and (ii) cash assets.

**Guidance Note:**

Additional invested assets should be selected in a manner such that if the starting asset portfolio were revised to include the additional invested assets, the projection would not be expected to experience any positive accumulated deficiencies at the end of any projection year.

It is assumed that the accumulated deficiencies for this scenario projection are known.

- b. To determine the NAER on additional invested assets for a given scenario:

- i. Project the additional invested asset portfolio as of the valuation date to the end of the projection period,
  - a) Investing any cash in the portfolio and reinvesting all investment proceeds using the company's investment policy.
  - b) Excluding any liability cash flows.
  - c) Incorporating the appropriate returns, defaults and investment expenses for the given scenario.
- ii. If the value of the projected additional invested asset portfolio does not equal or exceed the accumulated deficiencies at the end of each projection year for the scenario, increase the size of the initial additional invested asset portfolio as of the valuation date, and repeat the preceding step.
- iii. Determine a vector of annual earned rates that replicates the growth in the additional invested asset portfolio from the valuation date to the end of the projection period for the scenario. This vector will be the NAER for the given scenario.
- iv. If the projection results contain any extremely negative or positive NAER due to the depletion of assets in the denominator, the NAER shall be reset to a more appropriate discount rate, which may be carried out by imposing upper/lower limits or by using another approach, subject to actuarial judgement, that is appropriately prudent for statutory valuation.

**Guidance Note:** There are multiple ways to select the additional invested asset portfolio at the valuation date. Similarly, there are multiple ways to determine the earned rate vector. The company shall be consistent in its choice of methods, from one valuation to the next.

### C. Projection Scenarios

#### 1. Number of Scenarios

The number of scenarios for which the scenario reserve shall be computed shall be the responsibility of the company, and it shall be considered to be sufficient if any resulting understatement in the SR, as compared with that resulting from running additional scenarios, is not material.

#### 2. Economic Scenario Generation

Treasury Department interest rate curves, as well as investment return paths for index funds, equities, and fixed income assets shall be determined on a stochastic basis using the methodology described in Section 8. If the company uses a proprietary generator to develop scenarios, the company shall demonstrate that the resulting scenarios meet the requirements described in Section 8.

D. Projection of Assets

1. Starting Asset Amount

- a. For the projections of accumulated deficiencies, the value of assets at the start of the projection shall be set equal to the approximate value of statutory reserves at the start of the projection plus the allocated amount of PIMR attributable to the assets selected. Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:
  - i. Any hedge instruments held in support of the contracts being valued; and
  - ii. An amount of assets held in the general account equal to the approximate value of statutory reserves as of the start of the projections less the amount in (i).
- b. If the amount of initial general account assets is negative, the model should reflect a projected interest expense. General account assets chosen for use as described above shall be selected on a consistent basis from one reserve valuation hereunder to the next.

2. Valuation of Projected Assets

For purposes of determining the projected accumulated deficiencies, the value of projected assets shall be determined in a manner consistent with their value at the start of the projection. For assets assumed to be purchased during a projection, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics. However, for derivative instruments that are used in hedging and are not assumed to be sold during a particular projection interval, the company may account for them at an amortized cost in an appropriate manner elected by the company.

<p><b>Guidance Note:</b> Accounting for hedge assets should recognize any methodology prescribed by a company's state of domicile.</p>
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3. General Account Assets

- a. General account assets shall be projected, net of projected defaults, using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested in a manner that is representative of and consistent with the company's investment policy, subject to the following requirements:
  - i. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments or a fixed or floating rate interest basis, shall be determined by the company as part of the model representation;

- ii. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the projected Treasury Department curve along the relevant scenario and the requirements for gross asset spread assumptions stated below;
  - iii. For purchases of public non-callable corporate bonds, follow the requirements defined in VM-20 Sections 7.E, 7.F and 9.F. The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four;
  - iv. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in VM-20 Section 9.F for interest rate swap spreads;
  - v. For purchases of other fixed income investments, if included in modeled company investment strategy, set assumed gross asset spreads over U.S. Treasuries in a manner that is consistent with, and results in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.
- b. Notwithstanding the above requirements, the aggregate reserve shall be the higher of that produced by the modeled company investment strategy and that produced by substituting an alternative investment strategy in which the fixed income reinvestment assets have the same weighted average life (WAL) as the reinvestment assets in the modeled company investment strategy and are all public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of:
- i. ~~5% Treasury~~
  - 15
  - ii. 20% PBR credit rating 3 (Aa2/AA)
  - iii. 80% PBR credit rating 6 (A2/A)
- c. Any disinvestment shall be modeled in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable, provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period, taking into account duration, ratings, and other attributes of the borrowing mechanism. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with, but not necessarily the same as, the gross asset spreads in Section 4.D.4.a.iii and Section 4.D.4.a.v, recognizing that initial assets that mature

during the projection may have different characteristics than modeled reinvestment assets.

**Guidance Note:** This limitation is being referred to Life Actuarial (A) Task Force for review. The simple language above “provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period” is not intended to impose a literal requirement. It is intended to reflect a general concept to prevent excessively optimistic borrowing assumptions. It is recognized that borrowing parameters and rules can be complicated, such that modeling limitations may not allow for literal compliance, in every time step, as long as the reserve is not materially affected. However, if the company is unable to fully apply this restriction, prudence dictates that a company shall not allow borrowing assumptions to materially reduce the reserve.

4. Cash Flows from Invested Assets

- a. Cash flows from general account fixed income assets, including starting and reinvestment assets, shall be reflected in the projection as follows:
  - i. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario.
  - ii. Reflect asset default costs as prescribed in VM-20 Section 9.F and anticipated investment expenses through deductions to the gross investment income.
  - iii. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.
  - iv. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns or other economic values directly in the projection of asset cash flows. Asset defaults are not subject to this requirement, since asset default assumptions must be determined by the prescribed method as noted in 4.a.ii above.
- b. Cash flows from index funds and general account equity assets—i.e., non-fixed income assets having substantial volatility of returns, such as common stocks and real estate— including starting and reinvestment assets, shall be reflected in the projection as follows:
  - i. Determine the grouping for asset categories and the allocation of specific assets to each category in a manner that is consistent with that used for index crediting strategies, as discussed in Section 4.A.2.
  - ii. Project the gross investment return including realized and unrealized capital gains in a manner that is consistent with the stochastically generated scenarios.
  - iii. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses

through a deduction to the gross investment return using prudent estimate assumptions.

- c. Cash flows for each projection interval for policy loan assets shall follow the requirements in Section 10.H.

E. Projection of Annuitization Benefits

1. Assumed Annuitization Purchase Rates

- a. For payouts specified at issue (such as single premium immediate annuities, deferred income annuities, and certain structured settlements), such purchase rates shall reflect the payout rate specified in the contract.
- b. For purposes of projecting future elective annuitization benefits (including annuitizations stemming from the election of a GMIB) and withdrawal amounts from GMWBs, the projected annuitization purchase rates shall be determined assuming that market interest rates available at the time of election are the interest rates used to project general account assets, as determined in Section 4.D.4.

2. Projected Election of GMIBs, GMWBs and Other Annuitization Options

- a. For contracts projected to elect future annuitization options (including annuitizations stemming from the election of a GMIB) or for projections of GMWB benefits once the account value has been depleted, the projections shall assume the contract will stay in force, the projected periodic payments are paid, and the associated maintenance expenses are incurred.

F. Frequency of Projection

- 1. Use of an annual cash-flow frequency (“timestep”) is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of sensitivity to projection frequency should be validated by testing wherein the company should determine that the use of a more frequent—i.e., shorter—time step does not materially increase reserves. A more frequent time increment should always be used when the product features are sensitive to projection period frequency.

Care must be taken in simulating fee income and expenses when using an annual time step. For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption. It is also important that the frequency of the investment return model be linked appropriately to the projection horizon in the liability model.

G. Compliance with ASOPs

When determining a SR, the analysis shall conform to the ASOPs as promulgated from time to time by the ASB.

Under these requirements, an actuary will make various determinations, verifications and certifications. The company shall provide the actuary with the necessary information sufficient to

permit the actuary to fulfill the responsibilities set forth in these requirements and responsibilities arising from each applicable ASOP.

## Section 5: Reinsurance

### A. Treatment of Reinsurance in the Aggregate Reserve

#### 1. Aggregate Reserve Pre- and Post-Reinsurance Ceded

As noted in Section 3.B, the aggregate reserve is determined both pre-reinsurance ceded and post-reinsurance ceded. Therefore, it is necessary to determine the components needed to determine the aggregate reserve—i.e., the additional standard projection amount, the SR, DR, and/or the reserve amount valued using requirements in VM-A and VM-C, as applicable—on both bases. Sections 5.A.2 and 5.A.3 discuss adjustments to inputs necessary to determine these components on both a post-reinsurance ceded and a pre-reinsurance ceded basis.

#### 2. Reflection of Reinsurance Cash Flows in the DR or SR

- a. In order to determine the aggregate reserve post-reinsurance ceded, accumulated deficiencies, scenario reserves, and the resulting SR and DR shall be determined reflecting the effects of reinsurance treaties that meet the statutory requirements that would allow the treaty to be accounted for as reinsurance within statutory accounting. This involves including, where appropriate, all projected reinsurance premiums or other costs and all reinsurance recoveries, where the reinsurance cash flows reflect all the provisions in the reinsurance agreement, using prudent estimate assumptions.
  - i. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.
  - ii. All significant terms and provisions within reinsurance treaties shall be reflected. In addition, it shall be assumed that each party is knowledgeable about the treaty provisions and will exercise them to their advantage.

**Guidance Note:** Renegotiation of the treaty upon the expiration of an experience refund provision or at any other time shall not be assumed if such would be beneficial to the company and not beneficial to the counterparty. This is applicable to both the ceding party and assuming party within a reinsurance arrangement.

- iii. If the company has knowledge that a counterparty is financially impaired, the company shall establish a margin for the risk of default by the counterparty. In the absence of knowledge that the counterparty is financially impaired, the company is not required to establish a margin for the risk of default by the counterparty.
    - iv. A company shall include the cash flows from a reinsurance agreement or amendment in calculating the stochastic reserve if such qualifies for credit in compliance with Appendix A-791 of the Accounting Practices and Procedures Manual. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the aggregate reserve by the absolute value of such reductions in surplus.
  - b. In order to determine the SR and DR on a pre-reinsurance ceded basis, accumulated deficiencies, scenario reserves, and the resulting SR and DR shall be determined ignoring the effects of reinsurance ceded within the projections. Different approaches may be used to determine the starting assets on the ceded portion of the contracts, dependent upon the characteristics of a given treaty:



- i. For a standard coinsurance treaty, where the assets supporting the ceded liabilities were transferred to the assuming reinsurer, one acceptable approach involves a projection based on using starting assets on the ceded portion of the policies that are similar to those supporting the retained portion of the ceded policies or supporting similar types of policies. Scaling up each asset supporting the retained portion of the contract is also an acceptable method.

**Guidance Note:** For standard pro rata insurance treaties that do not include experience refunds, where allocated expenses are similar to the renewal expense allowance, reflecting the quota share applied to the present value of future reinsurance cash flows pertaining to the reinsured block of business may be considered as a possible approach to determine the ceded reserves.

- ii. Alternatively, a treaty may contain an identifiable portfolio of assets associated with the ceded liabilities. This could be the case for several forms of reinsurance: funds withheld coinsurance; modified coinsurance; coinsurance with a trust. To the extent these assets would be available to the cedant, an acceptable approach could involve modeling this portfolio of assets. To the extent that these assets were insufficient to defease the ceded liabilities, the modeling would partially default to the approach discussed for a standard coinsurance treaty. To the extent these assets exceeded what might be needed to defease the ceded liabilities (perhaps an over collateralization requirement in a trust), the inclusion of such assets shall be limited.

**Guidance Note:** Section 3.5.2 in ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*, provides possible methods for constructing a hypothetical pre-reinsurance asset portfolio, if necessary, for purposes of the pre-reinsurance reserve calculation.

- c. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
- d. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the NGE in reinsurance cash flows, the company shall include, but not be limited to, the following:
  - i. The usual and customary practices associated with such agreements.
  - ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
  - iii. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
  - iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.
  - v. Actions that might be taken by a party if the counterparty is in financial difficulty.
- e. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:

- i. Stochastically model the risk factors directly in the cash-flow model when calculating the SR.
- ii. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the SR to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is longevity reinsurance.

### 3. Reserve Determined Upon Passing the Exclusion Test

If a company passes the stochastic exclusion test and elects to use a methodology pursuant to applicable Sections VM-A and VM-C, as allowed in Section 3.E, it is important to note that the methodology produces reserves on a pre-reinsurance ceded basis. Therefore, the reserve must be adjusted for any reinsurance ceded accordingly. In addition, reserves valued under applicable Sections in VM-A and VM-C, unadjusted for reinsurance, shall be applied to the contracts falling under the scope of these requirements to determine the aggregate reserve prior to reinsurance.

It should be noted that the pre-reinsurance-ceded and post-reinsurance-ceded reserves may result in different outcomes for the exclusion test. In particular, it is possible that the pre-reinsurance-ceded reserves would pass the relevant exclusion test (and allow the use of VM-A and VM-C) while the post-reinsurance-ceded reserves might not, or vice versa.

### 4. Additional Standard Projection Amount

Where reinsurance is ceded, the additional standard projection amount shall be calculated as described in Section 6 to reflect the reinsurance costs and reinsurance recoveries under the reinsurance treaties. The additional standard projection amount shall also be calculated pre-reinsurance ceded using the methods described in Section 6 but ignoring the effects of the reinsurance ceded.

Section 6: Standard Projection Amount

## Section 7: Exclusion Testing

### A. Stochastic Exclusion Test Requirement Overview

1. The company may elect to exclude one or more groups of contracts from the SR calculation if the stochastic exclusion test (SET) is satisfied for each of the group of contracts. The company has the option to calculate or not calculate the SET.
  - a. If the company does not elect to calculate the SET for one or more groups of contracts, or the company calculates the SET and fails the test for such groups of contracts, the reserve methodology described in Section 4 shall be used for calculating the aggregate reserve for those groups of contracts.
  - b. If the company elects to calculate the SET for one or more groups of contracts, and passes the test for such groups of contracts, then for each group of contracts that passes the SET, the company shall choose whether or not to use the reserve methodology described in Section 4 for that group of contracts. If the reserve methodology described in Section 4 is not used for one or more groups of contracts, then the company shall use the reserve methodology pursuant to applicable requirements in VM-A and VM-C for those groups of contracts.
  - c. A company may not exclude a group of contracts from the SR requirements if there are one or more future hedging strategies supporting the contracts, with the exception of hedging programs solely supporting index credits as described in Section 9.A.1.
  - d. A company may elect to automatically exclude one or more groups of policies from the stochastic reserve calculation without passing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
    - i. All of the contracts are either:
      - Single Premium Immediate Annuities,
      - Term Certain Payout Annuities, or
      - Structured Settlement Contracts;
    - ii. None of the contracts are pension risk transfer annuities (PRT) or are covered under a longevity reinsurance agreement;
    - iii. Future payout benefits are either level or stay within 5% of the initial payout benefit amount over time;
    - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
    - v. The average [Macauley duration] of the liabilities of the contracts as measured from the issue date (or premium determination date) is less than [X].

### B. Requirement to Pass the Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date ~~within 12 months before the valuation date~~ the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. SET Certification Method—For groups of contracts that do not have guaranteed living benefits, future hedging strategies, or pension risk transfer business, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material across interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments).

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary's conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

- a) A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great as the assets required to support the group of contracts and certificates using the company's cash-flow testing model under each of the 48 scenarios identified in Section 7.C.1 or alternatively each of the New York seven economic scenarios under each of the three mortality adjustment factors identified in Section 7.C.1.
- b) A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
- c) A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company's non-guaranteed elements (NGEs) policy, assets backing the group of contracts, the company's longevity risk, and the company's investment strategy.

### C. Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the SR requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of  $(b-a)/a$  is less than the lesser of  $[x]\%$  and the percentage change that would trigger the company's materiality standard, where:
  - a.  $a$  = the adjusted scenario reserve described in Paragraph 7.C.2.a below using economic scenario 9 and 100% as the adjustment factor for mortality, the baseline economic scenario, as described in Appendix 1.E of VM-20.

- b.  $b$  = the largest adjusted scenario reserve described in Paragraph 7.C.2.a below under any of the 16 economic scenarios described in Appendix 1.E of VM-20 under [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company's margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company's margin for this exercise.

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve, minus the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of  $b$ .

- 2. In calculating the ratio in Section 7.C.1 above:
  - a. The company shall calculate an adjusted scenario reserve for the group of contracts for ~~each of~~ each of the 16 economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:
    - i. The scenario reserve defined in Section 4, but with the following differences:
      - a) Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Section 7.C.1.b of this section.
      - b) Using the interest rates and equity return assumptions specific to each scenario.
      - c) Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
      - d) Shall reflect future mortality improvement in line with anticipated experience assumptions.
      - e) Shall not reflect correlation between longevity and economic risks.
    - ii. The gross premium reserve developed from the cash flows from the company's asset adequacy analysis models, using the experience assumptions of the company's cash-flow analysis, but with the following differences:
      - a) Using the interest rates and equity return assumptions specific to each scenario.
      - b) Using the mortality scalars described in Section 7.C.1.b of this section.
      - c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the

company's cash-flow testing assumptions for default costs and reinvestment earnings.

- b. The company shall use the most current available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.
  - c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
  - d. The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.
  - e. If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to conduct the stochastic exclusion ratio test on only a single basis, either pre-reinsurance-ceded or post-reinsurance-ceded.
3. If the ratio calculated in this section is less than  $[x]\%$  pre-non-proportional reinsurance, but is greater than  $[x]\%$  post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.

<b>Guidance Note:</b> Further description of non-proportional reinsurance is provided in Paragraph 16 of SSAP 61R.
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- a. An example of an acceptable demonstration:
  - i. For convenience in notation •  $SERT = \frac{b-a}{a}$  defined in Section 7.C.1 above
    - a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted  $SERT_{gn}$
    - b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted  $SERT_{nn}$
  - ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.
  - iii. So, if  $SERT_{gn} \leq [x]\%$  but  $SERT_{nn} > [x]\%$ , then compute the largest percent increase in reserve (LPIR) =  $(b-a)/a$ , both “gross of non-proportional” and “net of non-proportional.”

$$\text{LPIR}_{\text{gn}} = (b_{\text{gn}} - a_{\text{gn}})/a_{\text{gn}}$$

$$\text{LPIR}_{\text{nn}} = (b_{\text{nn}} - a_{\text{nn}})/a_{\text{nn}}$$

Note that the scenario underlying  $b_{\text{gn}}$  could be different from the scenario underlying  $b_{\text{nn}}$ .

If  $\text{SERT}_{\text{gn}} \times \text{LPIR}_{\text{nn}}/\text{LPIR}_{\text{gn}} < [x]\%$ , then the block of contracts passes the SERT.

- b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 48 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.
4. The SERT may not be used for a group of contracts if, using the current year's data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in this section and concluded that such certification could not legitimately be made.

#### D. Stochastic Exclusion Demonstration Test

1. In order to exclude a group of contracts from the SR requirements using the Stochastic Exclusion Demonstration Test, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:
  - a. The demonstration shall provide a reasonable assurance that if the SR was calculated on a stand-alone basis for the group of contracts subject to the SR exclusion, the resulting stochastic reserve for those groups of contracts would not be higher than the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of contracts from the SR requirements.
  - b. If, as of the end of any calendar year, the company determines the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C for the group of contracts no longer adequately provides for all material risks, the exclusion shall be discontinued, and the company fails the SET for those contracts.
  - c. The demonstration may be based on analysis from a date that precedes the valuation date for the initial year to which it applies if the demonstration includes an explanation of why the use of such a date will not produce a material change in the outcome, as compared to results based on an analysis as of the valuation date.
  - d. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques, such as derivative programs and reinsurance.
2. The company may use one of the following or another method acceptable to the insurance commissioner to demonstrate compliance with Section 7.D.1 above:



- a. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the SR calculated on a stand-alone basis.
- b. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios.
- c. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the SR calculated on a stand-alone basis, but using a representative sample of contracts in the SR calculations.
- d. Demonstrate that any risk characteristics that would otherwise cause the SR calculated on a stand-alone basis to exceed the statutory reserve calculated in accordance with VM-A and VM-C, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance or passing the risk on to the contract holder by contract provision.

#### E. Deterministic Certification Option

1. The company may determine the SR for a group of contracts using a single deterministic economic scenario, subject to the following conditions.
  - a. The company certifies that economic conditions do not materially influence anticipated contract holder behavior for the group of contracts and certificates. Examples of contract holder options that are materially influenced by economic conditions include surrender benefits, recurring premium payments, and guaranteed living benefits.
  - b. The company certifies that the group of contracts and certificates is not supported by a reinvestment strategy that contains future hedge purchases.
  - c. The company must perform and disclose results from the stochastic exclusion ratio test following the requirements in Section 7.C, and the company must pass the SERT when considering only the 16 economic scenarios paired with the 100% mortality scenario.
  - d. The company must disclose a description of contracts and associated features in the certification.
2. The SR for the group of contracts under the Deterministic Certification Option is determined as follows:
  - a. Cash flows are projected in compliance with the applicable requirements in Section 4, Section 5, Section 10, and Section 11 of VM-22 over a single economic scenario (scenario 12 found in Appendix 1 of VM-20).
  - b. The SR equals the scenario reserve following the requirements for Section 4.



Section 8: To Be Determined (Scenario Generation for VM-21)

## Section 9: Modeling Hedges under a Non-Index Credit Future Hedging Strategy

### A. Initial Considerations

1. This section applies to modeling of hedges other than situations where the company only hedges index credits. If the company clearly separates index credit hedging from other hedging, then only the section only pertains to the other hedging if the index hedging follows the requirements in Section 4.A.4.b.i.
2. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the calculation of the SR, determined in accordance with Section 3.D and Section 4.D.
3. The company shall take into account the costs and benefits of hedge positions expected to be held by the company in the future along each scenario. Company management is responsible for developing, documenting, executing and evaluating the investment strategy, including the hedging strategy, used to implement the investment policy
4. For this purpose, the investment assets refer to all the assets, including derivatives supporting covered products and guarantees. This also is referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which also is referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. There is no attempt to distinguish what is the hedging portfolio and what is the investment portfolio in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.
5. This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the stochastic cash-flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

### B. Modeling Approaches

1. The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two types of methods as described below. Although a hedging strategy normally would be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the SR otherwise calculated. Particular attention should be given to Section 1.B Principle 5 for the modeling of future hedging strategies.
2. The fundamental characteristic of the first type of method, referred to as the “explicit method,” is that hedging positions and their resulting cash flows are included in the stochastic cash-flow model used to determine the scenario reserve, as discussed in Section 3.D, for each scenario.
3. The fundamental characteristic of the second type of method, referred to as the “implicit method,” is that the effectiveness of the current hedging strategy on future cash flows is evaluated, in part or in whole, outside of the stochastic cash-flow model. There are multiple

ways that this type of modeling can be implemented. In this case, the reduction to the SR otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.

4. Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions) on the SR needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. In addition, the reduction to the SR attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company's ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect.

**Guidance Note:** No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transform some risks into others, introduce new risks, or have other imperfections.

5. A safe harbor approach is permitted for reflection of future hedging strategies supporting the contracts for those companies whose modeled hedge assets comprise only linear instruments not sensitive to implied volatility. For companies with option-based hedge strategies, electing this approach would require representing the option-based portion of the strategy as a delta-rho two-Greek hedge program. The normally modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greeks as the original option portfolio.

C. Calculation of SR (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the future hedging strategies supporting the contracts (including both currently held and future hedge positions) into the stochastic cash-flow model on a best efforts basis, including all of the factors and assumptions needed to execute the future hedging strategies supporting the contracts (e.g., stochastic implied volatility). The determination of CTE70 (best efforts) may utilize either explicit or implicit modeling techniques.
2. The company shall calculate a CTE70 (adjusted) by recalculating the CTE70 assuming the company has no future hedging strategies supporting the contracts except those to hedge interest credits and hedge assets held by the company on the valuation date, therefore following the requirements of Section 4.A.4.a and 4.A.4.b.i.

However, for a company with a future hedging strategy supporting the contracts, existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements may be considered in one of two ways for the CTE70 (adjusted):

- a) Include the asset cash flows from any contractual payments and maturity values in the projection model; or
- b) No hedge positions – in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

3. Because most models will include at least some approximations or idealistic assumptions, CTE70 (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the value for the SR is given by:

$$SR = CTE70 (\text{best efforts}) + E \times \max[0, CTE70 (\text{adjusted}) - CTE70 (\text{best efforts})]$$

4. The company shall specify a value for *E* (the “error factor”) in the range from 5% to 100% to reflect the company’s view of the potential error resulting from the level of sophistication of the stochastic cash-flow model and its ability to properly reflect the parameters of the hedging strategy (i.e., the Greeks being covered by the strategy), as well as the associated costs, risks and benefits. The greater the ability of the stochastic model to capture all risks and uncertainties, the lower the value of *E*. The value of *E* may be as low as 5% only if the model used to determine the CTE70 (best efforts) effectively reflects all of the parameters used in the hedging strategy. If certain economic risks are not hedged, yet the model does not generate scenarios that sufficiently capture those risks, *E* must be in the higher end of the range, reflecting the greater likelihood of error. Likewise, simplistic hedge cash-flow models shall assume a higher likelihood of error.
5. The company shall conduct a formal back-test, based on an analysis of the available relevant period of data (but no less than 12 months), to assess how well the model is able to replicate the hedging strategy in a way that supports the determination of the value used for *E*.
6. Such a back-test shall involve one of the following analyses:
  - a. For companies that model hedge cash flows directly (“explicit method”), replace the stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario that represents the market path that actually manifested over the selected back-testing period and compare the projected hedge asset gains and losses against the actual hedge asset gains and losses – both realized and unrealized – observed over the same time period. For this calculation, the model assumptions may be replaced with parameters that reflect actual experience during the back-testing period. In order to isolate the comparison between the modeled hedge results and actual hedge results for this calculation, the projected liabilities should accurately reflect the actual liabilities throughout the back-testing period; therefore, adjustments that facilitate this accuracy (e.g. reflecting actual experience instead of model assumptions, including new business, etc.) are permissible.

To support the choice of a low value of *E*, the company should ascertain that the projected hedge asset gains and losses are within close range of 100% (e.g., 80–125%) of the actual hedge asset gains and losses. The company may also support the choice of a low value of *E* by achieving a high R-squared (e.g., 0.80 or higher) when using a regression analysis technique.
  - b. For companies that model hedge cash flows implicitly by quantifying the cost and benefit of hedging using the fair value of the hedged item (an “implicit method” or

“cost of reinsurance method”), calculate the delta, rho and vega coverage ratios in each month over the selected back-testing period in the following manner:

- i. Determine the hedge asset gains and losses—both realized and unrealized—incurred over the month attributable to equity, interest rate, and implied volatility movements.
  - ii. Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements. The hedged item should be defined in a manner that reflects the proportion of risks hedged (e.g., if a company elects to hedge 50% of a contract’s market risks, it should quantify the fair value of the hedged item as 50% of the fair value of the contract).
  - iii. Calculate the delta coverage ratio as the ratio between (i) and (ii) attributable to equity movements.
  - iv. Calculate the rho coverage ratio as the ratio between (i) and (ii) attributable to interest rate movements.
  - v. Calculate the vega coverage ratio as the ratio between (i) and (ii) attributable to implied volatility movements.
  - vi. To support the company’s choice of a low value of E, the company should be able to demonstrate that the delta and rho coverage ratios are both within close range of 100 % (e.g., 80–125%) consistently across the back-testing period.
  - vii. In addition, the company should be able to demonstrate that the vega coverage ratio is within close range of 100 % in order to use the prevailing implied volatility levels as of the valuation date in quantifying the fair value of the hedged item for the purpose of calculating CTE70 (best efforts). Otherwise, the company shall quantify the fair value of the hedged item for the purpose of calculating CTE70 (best efforts) in a manner consistent with the realized volatility of the scenarios captured in the CTE (best efforts).
- c. Companies that do not model hedge cash flows explicitly, but that also do not use the implicit method as outlined in Section 9.C.6.b above, shall conduct the formal back-test in a manner that allows the company to clearly illustrate the appropriateness of the selected method for reflecting the cost and benefit of hedging, as well as the value used for E.
7. A company that does not have 12 months of experience to date shall set E to a value that reflects the amount of experience available, and the degree and nature of any change to the hedge program. For a material change in strategy, with less than 12 months of experience and without robust mock testing, E should be 1.0. For a material change in strategy, with no less than 3 months of history, E should be 1.0. However, when a material change in hedging strategy with less than 3 months history is the introduction of hedging for a newly introduced product or newly acquired block of business and is supplemented by robust mock testing, E should instead be at least 0.3. Moreover, with prior approval from the domestic regulator, material changes in hedge strategy with less than 3 months history but with robust mock testing may have error factors less than 1.0, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for additional uncertainty in anticipated hedging experience beyond that of a

robust hedging program already in existence. E may be lower than 1.0 if the change in strategy is a minor refinement rather than a material change in strategy, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for any additional uncertainty associated with the refinement.

The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily 100% for substantial changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy) without robust mock-testing.
  - An increase in the error factor may not always be needed for minor refinements to the hedge strategy (e.g., moving from swaps to Treasury futures).
8. The company shall set the value of E reflecting the extent to which the future hedging program is clearly defined. To support a value of E below 1.0, there should be very robust documentation outlining the future hedging strategies. To the extent that documentation outlining any of the future hedging strategies is incomplete, the value of E shall be increased. In particular, the value of E shall be 1.0 if documentation is materially incomplete for any of the individual CDHS attributes (a) through (j), as listed in VM-01.

Any increases required to the value of E to reflect that documentation is not available to support that the future hedging strategies are clearly defined shall be in addition to increases to the value of E to reflect a lack of historical experience or to reflect the back-testing results, subject to an overall ceiling of 1.0 for E.

**Guidance Note:** Companies must use judgment both in determining an E factor and in applying this requirement in the case where there are multiple future hedging strategies, particularly where some may be CDHS and some may not be CDHS. In this case, the SR should be ensured to be no less than the CTE(70) reflecting the future hedging strategies that are CDHS and not reflecting those that are not CDHS. Companies with multiple future hedging strategies with very different levels of effectiveness or with multiple future hedging strategies that include both CDHS and non-CDHS should discuss with their domestic regulator.

#### E. Additional Considerations for CTE70 (best efforts)

If the company is following one or more future hedging strategies supporting the contracts, the fair value of the portfolio of contracts falling within the scope of these requirements shall be computed and compared to the CTE70 (best efforts) and CTE70 (adjusted). If the CTE70 (best efforts) is below both the fair value and CTE70 (adjusted), the company should be prepared to explain why that result is reasonable.

For the purposes of this analysis, the SR and fair value calculations shall be done without requiring the scenario reserve for any given scenario to be equal to or in excess of the cash surrender value in aggregate for the group of contracts modeled in the projection.

#### D. Specific Considerations and Requirements

1. As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for



purposes of reducing the SR, the company should review actual historical hedging effectiveness. The company shall evaluate the appropriateness of the assumptions on future trading, transaction costs, other elements of the model, the strategy, the mix of business and other items that are likely to result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, are likely to result in adverse results relative to those modeled. The parameters and assumptions shall be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model shall be modified to reflect them at either anticipated experience or adverse estimates of the parameters.

2. A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with the guaranteed contract holder options embedded in the non-variable annuities and other in-scope products and these same sensitivities associated with the hedging assets are subject to material discontinuities. This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the non-variable annuity and other in-scope products account balances reach a predetermined level in relationship to the guarantees. Any hedging strategy can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed contract holder options embedded in the non-variable annuities and other in-scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the SR, the company must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.
3. A strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.
4. The combination of elements of the stochastic cash-flow model—including the initial actual market asset prices, prices for trading at future dates, transaction costs and other assumptions—should be analyzed by the company as to whether the stochastic cash-flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:
  - a. Hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money.
  - b. Hedging strategies that, with a given amount of initial money, never make less than accumulation at the one-period risk-free rates in any scenario but make more than this in one or more scenarios.
5. If the stochastic cash-flow model allows for such situations, the company should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the SR otherwise calculated.

6. In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.
7. The company may also consider historical experience for similar current or past hedging programs on similar products to support the error factor determined for the projection.

## Section 10: Guidance and Requirements for Setting Contract Holder Behavior Prudent Estimate Assumptions

### A. General

Contract holder behavior assumptions encompass actions such as lapses, withdrawals, transfers, recurring deposits, benefit utilization, option election, etc. Contract holder behavior is difficult to predict accurately, and variance in behavior assumptions can significantly affect the reserves level. In the absence of relevant and fully credible empirical data, the company should set behavior assumptions as guided by Principle 3 in Section 1.B and Section 12.

In setting behavior assumptions, the company should examine, but not be limited by, the following considerations:

1. Behavior can vary by product, market, distribution channel, index performance, interest credited (current and guaranteed rates), time/product duration, etc.
2. Options embedded in the product may affect behavior.
3. Utilization of options may be elective or non-elective in nature. Living benefits often are elective, and death benefit options are generally non-elective.
4. Elective contract holder options may be more driven by economic conditions than non-elective options.
5. As the value of a product option increases, there is an increased likelihood that contract holders will behave in a manner that maximizes their financial interest (e.g., lower lapses, higher benefit utilization, etc.).
6. Behavior formulas may have both rational and irrational components (irrational behavior is defined as situations where some contract holders may not always act in their best financial interest). The rational component should be dynamic, but the concept of rationality need not be interpreted in strict financial terms and might change over time in response to observed trends in contract holder behavior based on increased or decreased financial efficiency in exercising their contractual options.
7. Options that are ancillary to the primary product features may or may not be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many considerations, such as:
  - a. The purpose for which the product purchased.
  - b. Whether the is option elective or non-elective.
  - c. Whether the value of the option is well-known.
8. External influences may affect behavior.

### B. Aggregate vs. Individual Margins

1. Prudent estimate assumptions are developed by applying a margin for uncertainty to the anticipated experience assumption. The issue of whether the level of the margin applied to the anticipated experience assumption is determined in aggregate or independently for each and every behavior assumption is discussed in Principle 3 in Section 1.B.

2. Although this principle discusses the concept of determining the level of margins in aggregate, it notes that the application of this concept shall be guided by evolving practice and expanding knowledge. From a practical standpoint, it may not always be possible to completely apply this concept to determine the level of margins in aggregate for all behavior assumptions.
3. Therefore, the company shall determine prudent estimate assumptions independently for each behavior (e.g., mortality, lapses and benefit utilization), using the requirements and guidance in this section and throughout these requirements, unless the company can demonstrate that an appropriate method was used to determine the level of margin in aggregate for two or more material behavior assumptions, if relevant to the risks in the product, and thus the approach will not understate the reserve.

C. Sensitivity Testing

The impact of behavior can vary by product, time period, etc. For any assumption that is not prescribed or stochastically modeled, the company shall use sensitivity testing to ensure that the assumption is set at the conservative end of the plausible range. The company shall sensitivity test:

- Surrenders.
- Partial withdrawals.
- Benefit utilization.
- Account transfers.
- Future deposits.
- Other behavior assumptions if relevant to the risks in the product.

Sensitivity testing of assumptions is required and shall be more complex than, for example, base lapse assumption plus or minus X% across all contracts. A more appropriate sensitivity test in this example might be to devise parameters in a dynamic lapse formula to reflect more out-of-the-money contracts lapsing and/or more holders of in-the-money contracts persisting and eventually using the guarantee. The company should apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the company shall use higher margins when the underlying experience is less than fully relevant and credible.

The company shall examine the results of sensitivity testing to understand the materiality of prudent estimate assumptions on the modeled reserve. The company shall update the sensitivity tests periodically as appropriate, considering the materiality of the results of the tests. The company may update the tests less frequently (but no less than every 3 years) when the tests show less sensitivity of the modeled reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company may perform sensitivity testing:

1. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
2. Using data from prior periods.

D. Specific Considerations and Requirements

1. Within materiality considerations, the company should consider all relevant forms of contract holder behavior and persistency, including, but not limited to, the following:
  - a. Mortality (additional guidance and requirements regarding mortality is contained in Section 11).
  - b. Surrenders.
  - c. Partial withdrawals (systematic and elective).
  - d. Account transfers (switching/exchanges).
  - e. Resets/ratchets of the guaranteed amounts (automatic and elective).
  - f. Future deposits.
  - g. Income start date for the benefit utilization.
  - h. Commutation of benefit (from periodic payment to lump sum or vice versa.)
2. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the calculated provisions.  
For example:
  - a. The impact of account transfers (intra-contract index “switching”) might be ignored, unless required under the terms of the contract (e.g., automatic re-allocation/rebalancing, ) or if the contract provisions incentivize the contract holders to transfer between accounts.
  - b. Future deposits might be excluded from the model, unless required by the terms of the contracts under consideration and then only in such cases where future premiums can reasonably be anticipated (e.g., with respect to timing and amount).
  - c. For some non-elective benefits (nursing home benefits for example), a zero incidence rate after the surrender charge has ended, or the cash value has depleted, may be acceptable since use of a non-zero rate could reduce the modeled reserve.
3. However, the company should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to test the impact of a shifting asset mix and/or consider future deposits to the extent they can reasonably be anticipated and increase the calculated amounts.
4. Normally, the underlying model assumptions would differ according to the attributes of the contract being valued. This would typically mean that contract holder behavior and persistency may be expected to vary according to such characteristics as (this is not an exhaustive list):
  - a. Gender.

- b. Attained age.
  - c. Issue age.
  - d. Contract duration.
  - e. Time to maturity.
  - f. Tax status.
  - g. Account value.
  - h. Interest credited (current and guaranteed).
  - i. Available indices.
  - j. Guaranteed benefit amounts.
  - k. Surrender charges, transaction fees or other contract charges.
  - l. Distribution channel.
5. Unless there is clear evidence to the contrary, behavior assumptions should be no less conservative than past experience. Margins for contract holder behavior assumptions shall assume, without relevant and credible experience or clear evidence to the contrary, that contract holders' efficiency will increase over time.
6. In determining contract holder behavior assumptions, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience), whether or not the segment is directly written by the company. If data from a similar business segment are used, the assumption shall be adjusted to reflect differences between the two segments. Margins shall reflect the data uncertainty associated with using data from a similar but not identical business segment.
7. Where relevant and fully credible empirical data do not exist for a given contract holder behavior assumption, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is shifted towards the conservative end of the plausible range of expected experience that serves to increase the SR. If there are no relevant data, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is at the conservative end of the range. Such adjustments shall be consistent with the definition of prudent estimate, with the principles described in Section 1.B, and with the guidance and requirements in this section.
8. Ideally, contract holder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. It is important to note, however, that contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally. These extreme assumptions may be used for modeling efficiency if the result is more conservative.

#### E. Dynamic Assumptions

1. Consistent with the concept of prudent estimate assumptions described earlier, the liability model should incorporate margins for uncertainty for all risk factors that are not stochastically modeled.
2. The company should exercise care in using static assumptions when it would be more appropriate to use a dynamic model or other scenario-dependent formulation for behavior. With due allowance for appropriate simplifications, approximations and modeling efficiency techniques, the use of dynamic models is encouraged, but not mandatory. Static assumptions that could reasonably be expected to vary according to a stochastic process, or future states of the world (especially in response to economic drivers), may require higher margins and/or signal a need for higher margins for certain other assumptions.
3. Risk factors that are modeled dynamically should encompass the plausible range of behavior consistent with the economic scenarios and other variables in the model, including the non-scenario tested assumptions. The company shall test the sensitivity of results to understand the materiality of making alternate assumptions and follow the guidance discussed above on setting assumptions for sensitive behaviors.

F. Consistency with the CTE Level

1. All behaviors (i.e., dynamic, formulaic and non-scenario tested) should be consistent with the scenarios used in the CTE calculations (generally, the top 30% of the loss distribution). To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the company should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use prudent estimate assumptions for behavior that are reasonable and appropriate in such scenarios. For non-variable annuities, these “valuation” scenarios would typically display one or more of the following attributes:
  - a. Declining, increasing and/or volatile index values, where applicable.
  - b. Price gaps and/or liquidity constraints.
  - c. Volatile interest rates or persistently low interest rates.
2. The behavior assumptions should be logical and consistent both individually and in aggregate, especially in the scenarios that govern the results. In other words, the company should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:
  - a. Remain logically and internally consistent across the scenarios tested.
  - b. Represent plausible outcomes.
  - c. Lead to appropriate, but not excessive, asset requirements.
4. The company should remember that the continuum of “plausibility” should not be confined or constrained to the outcomes and events exhibited by historic experience.
5. Companies should attempt to track experience for all assumptions that materially affect their risk profiles by collecting and maintaining the data required to conduct credible and meaningful studies of contract holder behavior.

G. Additional Considerations and Requirements for Assumptions Applicable to Guaranteed Living Benefits

Experience for contracts without guaranteed living benefits may be of limited use in setting a lapse assumption for contracts with in-the-money or at-the-money guaranteed living benefits. Such experience may only be used if it is appropriate (e.g., lapse experience on contracts without a living benefit may have relevance to the early durations of contracts with living benefits) and relevant to the business.

H. Policy Loans

If policy loans are applicable for the block of business, the company shall determine cash flows for each projection interval for policy loan assets by modeling existing loan balances either explicitly or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

1. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution:
  - a. Produces reserves that are no less than those that would be produced by modeling existing loan balances explicitly.
  - b. Complies with the contract holder behavior requirements stated in Section 10.A to Section 10.G above.
2. If the company models policy loans explicitly, the company shall:
  - a. Treat policy loan activity as an aspect of contract holder behavior and subject to the requirements above in this section.
  - b. Assign loan balances either to exactly match each contract's utilization or to reflect average utilization over a model segment or sub-segments if the results are materially similar.
  - c. Model policy loan interest in a manner consistent with contract provisions and with the scenario. Include interest paid in cash as a positive policy loan cash flow in that projection interval, but do not include interest added to the loan balance as a policy loan cash flow. (The increased balance will require increased repayment cash flows in future projection intervals.)
  - d. Model policy loan principal repayments, including those that occur automatically upon death or surrender. Include policy loan principal repayments as a positive policy loan cash flow, per Section 4.A.1.h.
  - e. Model policy loan principal. Include additional policy loan principal as a negative policy loan cash flow, per Section 4.A.1.h (but do not include interest added to the loan balance as a negative policy loan cash flow).
  - f. Model any investment expenses allocated to policy loans and include them either with negative policy loan cash flows or insurance expense cash flows.

I. Non-Guaranteed Elements



Consistent with the definition in VM-01, Non-Guaranteed Elements (NGEs) are elements within a contract that affect contract costs or values and are not guaranteed or not determined at issue. NGEs consist of elements affecting contract holder costs or values that are both established and subject to change at the discretion of the insurer.

Examples of NGEs specific to non-variable annuities include but are not limited to the following: the credited rates on fixed accounts, index parameters (caps, spreads, participation rates, etc.), rider fees, rider benefit features being subject to change (rollup rates, rollup period, etc.), account value charges, and dividends under participating policies or contracts.

1. Except as noted below in Section 10.I.5, the company shall include NGE in the models to project future cash flows beyond the time the company has authorized their payment or crediting.
2. The projected NGE shall reflect factors that include, but are not limited to, the following (not all of these factors will necessarily be present in all situations):
  - a. The nature of contractual guarantees.
  - b. The company's past NGE practices and established NGE policies.
  - c. The timing of any change in NGE relative to the date of recognition of a change in experience.
  - d. The benefits and risks to the company of continuing to authorize NGE.
3. Projected NGE shall be established based on projected experience consistent with how actual NGE are determined.
4. Projected levels of NGE in the cash-flow model must be consistent with the experience assumptions used in each scenario. Contract holder behavior assumptions in the model must be consistent with the NGE assumed in the model.
5. The company may exclude any portion of an NGE that is not based on some aspect of the contract's experience.
6. However, if the board has guaranteed a portion of the NGE into the future, the company must model that amount. In other words, the company cannot exclude from its model any NGE that the board has guaranteed for future years, even if it could have otherwise excluded them, based on this subsection.

**Drafting Note:** Comments are sought for any insight into whether authorization from the board or documentation should be considered in allowing exclusion of NGEs.

7. The liability for contract holder dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date is reported separately from the statutory reserve. The contract holder dividends that give rise to this dividend liability as of the valuation date may or may not be included in the cash-flow model at the company's option.
  - a. If the contract holder dividends that give rise to the dividend liability are not included in the cash-flow model, then no adjustment is needed to the resulting SR.
  - b. If the contract holder dividends that give rise to the dividend liability are included in the cash-flow model, then the resulting SR should be reduced by the amount of the dividend liability.

8. All projected cash flows associated with NGEs shall reflect margins for adverse deviations and estimation error in prudent estimate assumptions.

## Section 11: Guidance and Requirements for Setting Prudent Estimate Mortality Assumptions

### A. Overview

#### 1. Intent

The guidance and requirements in this section apply to setting prudent estimate mortality assumptions when determining the SR. The intent is for prudent estimate mortality assumptions to be based on facts, circumstances and appropriate actuarial practice.

#### 2. Description

Prudent estimate mortality assumptions shall be determined by first developing expected mortality curves based on either available experience or published tables. Where necessary, margins shall be applied to the experience to reflect data uncertainty. The expected mortality curves shall then be adjusted based on the credibility of the experience used to determine the expected mortality curve. Section 11.B addresses guidance and requirements for determining expected mortality curves, and Section 11.C addresses guidance and requirements for adjusting the expected mortality curves to determine prudent estimate mortality.

Finally, the credibility-adjusted tables shall be adjusted for mortality improvement (where such adjustment is permitted or required) using the guidance and requirements in Section 11.D.

#### 3. Business Segments

For purposes of setting prudent estimate mortality assumptions, the products falling under the scope of these requirements shall be grouped into business segments with different mortality assumptions. The grouping, at a minimum, should differentiate between payout annuities or deferred annuity contracts that contain GLBs, and deferred annuity contracts with no guaranteed benefits or only GMDBs. Where appropriate, the grouping should also differentiate between segments which are known or expected to contain contract holders with sociodemographic, geographic, or health factors reasonably expected to impact the mortality assumptions for the segment (e.g., annuitants drawn from different countries, geographic areas, industry groups, or impaired lives on individually underwritten contracts such as structured settlements). The grouping should also generally follow the pricing, marketing, management and/or reinsurance programs of the company.

**Guidance Note:** This paragraph contemplates situations where it may be appropriate to differentiate mortality assumptions by segment or even by contract due to varying sociodemographic, geographic, or health factors. Particularly, though not exclusively, in the context of group payout annuity contracts, companies may have credible, contract-specific mortality experience data or relevant pooled data from annuitants drawn from similar industries or geographies that may be used to sub-divide inforce blocks into business segments for purposes of setting prudent estimate mortality assumptions.

For example, a company may sell group PRT contracts both to union plans in the U.S. and to private single-employer plans in another country. While both are “PRT contracts,” it would be appropriate to differentiate them for mortality assumption purposes, similar to

how payout annuities vs. deferred annuities are distinguished.

4. Margin for Data Uncertainty

The expected mortality curves that are determined in Section 11.B may need to include a margin for data uncertainty. The margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the provision for uncertainty to mortality. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment.

For purposes of this section, if mortality must be increased (decreased) to provide for uncertainty, the business segment is referred to as a mortality (longevity) segment.

It may be necessary, because of a change in the mortality risk profile of the segment, to reclassify a business segment from a mortality (longevity) segment to a longevity (mortality) segment to the extent compliance with this section requires such a reclassification.

B. Determination of Expected Mortality Curves

1. Experience Data

In determining expected mortality curves, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience). See Section 11.B.2 for additional considerations. Finally, if there is no data, the company shall use the applicable table, as required in Section 11.B.3.

2. Data Other Than Direct Experience

Adjustments shall be applied to the data to reflect differences between the business segments, and margins shall be applied to the adjusted expected mortality curves to reflect the data uncertainty associated with using data from a similar but not identical business segment.

To the extent the mortality of a business segment is reinsured, any mortality charges that are consistent with the company's own pricing and applicable to a substantial portion of the mortality risk also may be a reasonable starting point for the determination of the company's expected mortality curves.

3. Little or No Data Requirements

- i. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no less than:

[2021 SOA Deferred Annuity Mortality Table] with [Projection Scale G2] for individual deferred annuities that do not contain guaranteed living benefits

$$q_x^{20XX+n} = q_x^{20XX}(1 - G2_x)^n$$

ii. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no greater than:

- a. [The appropriate percentage ( $F_x$ ) from Table 11.1 applied to the 2012 IAM Basic Mortality Table] with [Projection Scale G2] for individual payout annuity contracts and deferred annuity contracts with guaranteed living benefits

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n * F_x$$

- b. [1983 Table “a”] for structured settlements or other contracts with impaired mortality
- c. [1994 GAR Table] with [Projection Scale AA] for group annuities

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

Table 11.1

Attained Age (x)	$F_x$	
<=65	80.0%	
66	81.5%	
67	83.0%	
68	84.5%	
69	86.0%	
70	87.5%	
71	89.0%	
72	90.5%	
73	92.0%	
74	93.5%	
75	95.0%	
76	96.5%	
77	98.0%	
78	99.5%	
79	101.0%	
80	102.5%	
81	104.0%	
82	105.5%	
83	107.0%	
84	108.5%	
85	110.0%	
86	110.0%	
87	110.0%	
88	110.0%	

89	110.0%	
90	110.0%	
91	110.0%	
92	110.0%	
93	110.0%	
94	110.0%	
95	110.0%	
96	109.0%	
97	108.0%	
98	107.0%	
99	106.0%	
100	105.0%	
101	104.0%	
102	103.0%	
103	102.0%	
104	101.0%	
>=105	100.0%	

iii. For a business segment with non-U.S. insureds, when little or no experience or information is available on a business segment, an established industry or national mortality table and mortality improvement scale may be used, with approval from the domiciliary commissioner.

4. Additional Considerations Involving Data

The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., direct data discussed in Section 11.B.1 or other than direct data discussed in Section 11.B.2).

a. Underreporting of Deaths

Mortality data shall be examined for possible underreporting of deaths. Adjustments shall be made to the data if there is any evidence of underreporting. Alternatively, exposure by lives or amounts on contracts for which death benefits were in the money may be used to determine expected mortality curves. Underreporting on such exposures should be minimal; however, this reduced subset of data will have less credibility.

b. Experience by Contract Duration

Experience of a plus segment shall be examined to determine if mortality by contract duration increases materially due to selection at issue. In the absence of information, the company shall assume that expected mortality will increase by contract duration for an appropriate select period. As an alternative, if the company determines that mortality is affected by selection, the company could apply margins to the expected mortality in such a way that the actual mortality modeled does not depend on contract duration.

c. Modification and Relevance of Data

Even for a large company, the quantity of life exposures and deaths are such that a significant amount of smoothing may be required to determine expected mortality curves from mortality experience. Expected mortality curves, when applied to the recent historic exposures (e.g., three to seven years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments.

In determining expected mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine expected mortality curves should be documented.

d. Other Considerations

In determining expected mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

C. Adjustment for Credibility to Determine Prudent Estimate Mortality

1. Adjustment for Credibility

The expected mortality curves determined in Section 11.B shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at prudent estimate mortality. The adjustment for credibility shall result in blending the expected mortality curves including margins for uncertainty with the mortality assumptions described in Section 11.B.3. The approach used to adjust the curves shall suitably account for credibility.

**Guidance Note:** For example, when credibility is zero, an appropriate approach should result in a mortality assumption consistent with 100% of the industry mortality assumption described in Section 11.B.3 used in the blending.

2. Adjustment of Industry Mortality for Improvement

For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be and the industry mortality table for a minus segment must be adjusted for mortality improvement. Such adjustment shall reflect the mortality improvement scale described in Section 11.B.3 from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the expected mortality curves.

3. Credibility Procedure

The credibility procedure used shall:

- a. Produce results that are reasonable.
- b. Not tend to bias the results in any material way.
- c. Be practical to implement.
- d. Give consideration to the need to balance responsiveness and stability.

- e. Take into account not only the level of aggregate claims but the shape of the mortality curve.
- f. Contain criteria for full credibility and partial credibility that have a sound statistical basis and be appropriately applied.

4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement

The credibility-adjusted table used for plus segments may be and the credibility adjusted table used for minus segments must be adjusted for mortality improvement using the applicable mortality improvement scale described in Section 11.B.3 from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement beyond the valuation date is discussed in Section 11.D.

D. Future Mortality Improvement

The mortality assumption resulting from the requirements of Section 11.C shall be adjusted for mortality improvements beyond the valuation date if such an adjustment would serve to increase the resulting SR. If such an adjustment would reduce the SR, such assumptions are permitted, but not required. In either case, the assumption must be based on current relevant data with a margin for uncertainty (increasing assumed rates of improvement if that results in a higher reserve or reducing them otherwise).

## Section 12: Other Guidance and Requirements for Assumptions

### A. Overview

This section provides guidance and requirements in general for setting prudent estimate assumptions when determining either the SR or DR. It also provides specific guidance and requirements for expense assumptions.

### B. General Assumption Requirements

1. The company shall use prudent estimate assumptions for risk factors that are not stochastically modeled by applying margins to the anticipated experience assumptions if such risk factors have been categorized as material risks by following Section 1.B Principle 3 and requirements in Section 12.C.
2. The company shall establish the prudent estimate assumptions for risk factors in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.
3. The company shall model the following risk factors stochastically unless the company elects the stochastic modeling exclusion defined in Section 7:
  - a. Interest rate movements (i.e., Treasury interest rate curves).
  - b. Equity performance (e.g., Standard & Poor's 500 index [S&P 500] returns and returns of other equity investments).
4. If the company elects to stochastically model risk factors in addition to the economic scenarios, the requirements in this section for determining prudent estimate assumptions for these risk factors do not apply.

**Guidance Note:** It is expected that companies will not stochastically model risk factors other than the economic scenarios, such as contract holder behavior or mortality, until VM-22 has more specific guidance and requirements available. Companies shall discuss with domiciliary regulators if they wish to stochastically model other risk factors.

5. The company shall use its own experience, if relevant and credible, to establish an anticipated experience assumption for any risk factor. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the anticipated experience assumption, making modifications as needed to reflect the circumstances of the company.
  - a. For risk factors (such as mortality) to which statistical credibility theory may be appropriately applied, the company shall establish anticipated experience assumptions for the risk factor by combining relevant company experience with industry experience data, tables or other applicable data in a manner that is consistent with credibility theory and accepted actuarial practice.



- b. For risk factors (such as utilization of guaranteed living benefits) that do not lend themselves to the use of statistical credibility theory, and for risk factors (such as some of the lapse assumptions) to which statistical credibility theory can be appropriately applied but cannot currently be applied due to lack of industry data, the company shall establish anticipated experience assumptions in a manner that is consistent with accepted actuarial practice and that reflects any available relevant company experience, any available relevant industry experience, or any other experience data that are available and relevant. Such techniques include:
    - i. Adopting standard assumptions published by professional, industry or regulatory organizations to the extent they reflect any available relevant company experience or reasonable expectations.
    - ii. Applying factors to relevant industry experience tables or other relevant data to reflect any available relevant company experience and differences in expected experience from that underlying the base tables or data due to differences between the risk characteristics of the company experience and the risk characteristics of the experience underlying the base tables or data.
    - iii. Blending any available relevant company experience with any available relevant industry experience and/or other applicable data using weightings established in a manner that is consistent with accepted actuarial practice and that reflects the risk characteristics of the underlying contracts and/or company practices.
  - c. For risk factors that have limited or no experience or other applicable data to draw upon, the assumptions shall be established using sound actuarial judgment and the most relevant data available, if such data exists.
  - d. For any assumption that is set in accordance with the requirements of Section 12.B.5.c, the qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing and disclose the analysis performed to ensure that the assumption is set at the conservative end of the plausible range.
  - e. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of statistical or other testing indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary shall set a new, adequate, anticipated experience assumption for the factor.
6. The company shall sensitivity test risk factors that are not stochastically modeled and examine the impact on the stochastic reserve. The company shall update the sensitivity tests periodically as appropriate. The company may update the tests less frequently, but no less than every 3 years, when the tests show less sensitivity of the stochastic reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company

may perform sensitivity testing:

- a. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
- b. Using data from prior periods.

**Guidance Note:** Sensitivity testing every risk factor on an annual basis is not required. For some risk factors, it may be reasonable, in lieu of sensitivity testing, to employ statistical measures for margins, such as adding one or more standard deviations to the anticipated experience assumption.

7. The company shall vary the prudent estimate assumptions from scenario to scenario within the stochastic reserve calculation in an appropriate manner to reflect the scenario-dependent risks.

C. Assumption Margins

The company shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed, subject to the following:

1. The level of margin applied to the anticipated experience assumptions may be determined in aggregate or independently as discussed in Section 1.B Principle 3. It is not permissible to set a margin less toward the conservative end of the spectrum to recognize, in whole or in part, implicit or prescribed margins that are present, or are believed to be present, in other risk factors.

Risks that are stochastically modeled (e.g., interest rates, equity returns) or have prescribed margins or guardrails (e.g., assets, revenue sharing) shall be considered material risks. Other risks generally considered to be material include, but are not limited to, mortality, contract holder behavior, maintenance and overhead expenses, inflation and implied volatility. In some cases, the list of material risks may also include acquisition expenses, partial withdrawals, policy loans, annuitizations, account transfers and deposits, and/or option elections that contain an element of anti-selection.

2. The greater the uncertainty in the anticipated experience assumption, the larger the required margin, with the margin added or subtracted as needed to produce a larger Sr or DR than would otherwise result. For example, the company shall use a larger margin when:
  - a. The experience data have less relevance or lower credibility.
  - b. The experience data are of lower quality, such as incomplete, internally inconsistent or not current.
  - c. There is doubt about the reliability of the anticipated experience assumption, such as, but not limited to, recent changes in circumstances or changes in company policies.
  - d. There are constraints in the modeling that limit an effective reflection of the risk factor.

3. In complying with the sensitivity testing requirements in Section 12.B.6 above, greater analysis and more detailed justification are needed to determine the level of uncertainty when establishing margins for risk factors that produce greater sensitivity on the stochastic reserve.
4. A margin is permitted but not required for assumptions that do not represent material risks.
5. A margin should reflect the magnitude of fluctuations in historical experience of the company for the risk factor, as appropriate.
6. The company shall apply the method used to determine the margin consistently on each valuation date but is permitted to change the method from the prior year if the rationale for the change and the impact on the stochastic reserve is disclosed.

#### D. Expense Assumptions

##### 1. General Prudent Estimate Expense Assumption Requirements

In determining prudent estimate expense assumptions, the company:

- a. May spread certain information technology development costs and other capital expenditures over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles.

**Guidance Note:** Care should be taken with regard to the potential interaction with the inflation assumption below.

- b. Shall assume that the company is a going concern.
- c. Shall choose an appropriate expense basis that properly aligns the actual expense to the assumption. If values are not significant, they may be aggregated into a different base assumption.

**Guidance Note:** For example, death benefit expenses should be modeled with an expense assumption that is per death incurred.

- d. Shall reflect the impact of inflation.
- e. Shall not assume future expense improvements.
- f. Shall not include assumptions for federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) and foreign income taxes.
- g. Shall use assumptions that are consistent with other related assumptions.
- h. Shall use fully allocated expenses.

**Guidance Note:** Expense assumptions should reflect the direct costs associated with the block of contracts being modeled, as well as indirect costs and overhead costs that have been allocated to the modeled contracts.

- i. Shall allocate expenses using an allocation method that is consistent across

company lines of business. Such allocation must be determined in a manner that is within the range of actuarial practice and methodology and consistent with applicable ASOPs. Allocations may not be done for the purpose of decreasing the stochastic reserve.

- j. Shall reflect expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger in the expense assumption only when any future costs associated with achieving the efficiencies are also recognized.

**Guidance Note:** For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past, then there would be no future expenses to reflect in the valuation.

- k. Shall reflect the direct costs associated with the contracts being modeled, as well as an appropriate portion of indirect costs and overhead (i.e., expense assumptions representing fully allocated expenses should be used), including expenses categorized in the annual statement as “taxes, licenses and fees” (Exhibit 3 of the annual statement) in the expense assumption.
- l. Shall include acquisition expenses associated with business in force as of the valuation date and significant non-recurring expenses expected to be incurred after the valuation date in the expense assumption.
- m. For contracts sold under a new policy form or due to entry into a new product line, the company shall use expense factors that are consistent with the expense factors used to determine anticipated experience assumptions for contracts from an existing block of mature contracts taking into account:
  - i. Any differences in the expected long-term expense levels between the block of new contacts and the block of mature contracts.
  - ii. That all expenses must be fully allocated as required under Section 12.D.1.h above.

## 2. Margins for Prudent Estimate Expense Assumptions

The company shall determine margins for expense assumptions following Section 12.C.

### Section 13: Allocation of Aggregate Reserves to the Contract Level

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve; however, contracts for which the Deterministic Certification Option is elected in Section 7.E are subject to the allocation methodology described in this Section 12. Allocation calculations shall be done separately for the DR and SR, and for different reserving categories.

Under the allocation methodology described in this section, the reserve held for any contract will be no less than the cash surrender value provided under that contract, after consideration of any reinsurance. Additionally, the reserve held for a Payout Annuity contract (whether life-contingent or not) will be no less than the present value of the liability cash flows provided under the contract, after consideration of any reinsurance, discounted using the NAER described in Section 12.B.1 or 12.B.2, as applicable. The allocation methodology is a formulaic approach that is designed, generally, to allocate the excess aggregate reserves based on a measure of the risk and, therefore, to generally allocate a greater portion of the excess aggregate reserves to contracts that have greater risk. For example, an indexed annuity contract with a high benefit GLWB will typically have a larger allocated excess reserve than an otherwise identical indexed annuity contract with a low benefit GLWB or no GLWB.

- A. The contract-level reserve for each contract shall be the sum of the following:
1. The contract's minimum allocation value (MAV), as defined in Section 13.C.
  2. The contract's allocated excess reserve (AER), as defined in Section 12.D.
- B. Scenario actuarial present value (APV)
1. For a group of contracts for which a company does not elect the Deterministic Certification Option in Section 7.E, the Scenario APV for each contract is equal to the discounted liability cash flows at the NAER, pursuant to requirements in Section 4, for the aggregate scenario that produces the scenario reserve for the group that is closest to, but not greater than the SR defined in Section 3.D.
    - a. If the Direct Iteration Method is used to satisfy the requirements in Section 4.B.1, then the company shall:
      - i. Determine a path of NAER for each model segment that reflects the net general account portfolio rate in each projection interval (i.e., monthly, quarterly, annually), which will depend primarily on:
        1. Projected net investment earnings from the portfolio of starting assets.
        2. Pattern of projected asset cash flows from the starting assets and subsequent reinvestment assets.
        3. Pattern of net liability cash flows.
        4. Projected net investment earnings from reinvestment assets.
      - ii. The company shall calculate the NAER as the ratio of net investment

earnings divided by invested assets subject to the requirements in a through e below. All items reflected in the ratio are consistent with statutory asset valuation and accrual accounting, including reflection of due, accrued or unearned investment income where appropriate.

1. The NAER for each projection interval is calculated in a manner that is consistent with the timing of cash flows and length of the projection interval of the related cash-flow model.
2. Net investment earnings include:
  - a. Gross investment income plus capital gains and losses, minus prescribed default costs, and minus investment expenses.
  - b. Income from derivative asset programs, subject to the requirements in Sections 4 and 9 of VM-22.
3. Invested assets are determined in a manner that is consistent with the timing of cash flows within the cash-flow model and the length of the projection interval of the cash-flow model.
4. The annual statement value of derivative instruments or a reasonable approximation thereof is in invested assets.

**Drafting Note:** The above NAER guidance is in line with the VM-20 NAER methodology, rather than the VM-21/VM-22 NAER methodology under an additional invested asset portfolio. During the exposure period, interested parties are encouraged to provide any feedback on the appropriateness of this approach.

2. For a group of contracts for which a company elects the Deterministic Certification Option defined in Section 7.E, the Scenario APV for each contract is equal to the discounted liability cash flows at the NAER in the single scenario used to calculate the reserve.
  3. For projecting future liability cash flows under either Section 13.B.1 or 13.B.2, as applicable, assume the same liability assumptions that were used to calculate the SR defined in Section 3.D.
- C. Minimum allocation value (MAV)
1. For Payout Annuity contracts, the MAV is equal to the greater of:
    - a. The Scenario APV for the contract, or
    - b. The cash surrender value provided under the contract, if any.
  2. For Account Value Based Annuity contracts, the MAV is equal to the cash surrender value provided under the contract, if any, otherwise zero.
- D. Allocated excess reserve (AER)

1. For each contract in a group of contracts, the AER is determined by allocating the excess, if any, of the group's aggregate reserve over the group's aggregate MAV to the contract in proportion to the excess of the Scenario APV over the MAV for such contract.
2. If the Scenario APV for any contract is less than the MAV, then the excess Scenario APV to be used for allocating the excess aggregate reserve to that contract shall be floored at zero.
3. If all contracts in the group have an excess Scenario APV that is floored at zero, then use the MAV to allocate any excess aggregate reserve over the aggregate MAV.
4. If a group's aggregate reserve is less than the group's aggregate MAV, that difference should be allocated to life contingent contracts in proportion to each life contingent contract's MAV to the sum of the life contingent contracts MAV.

E. As a hypothetical example, consider a company with the results of the following eight contracts in reserving categories:

Table 12.1.A: Hypothetical Sample Allocation of Aggregate Reserve: Group A, Account Value Based Annuity Contracts

					Excess (floored)		Excess of Aggregate	Allocated	
			Scenario	Minimum	of Scenario	Aggregate	Reserve over	Excess	Total
		CSV	APV	Allocation	APV over MAV	Reserve	Aggregate MAV	Reserve	Contract
		(1)	(2)	Value (MAV)	(4) =	CTE 70	(6) = Max[(5 Total)	((7) = (4) x	Level
Contract	Example Product Type	(1)	(2)	(3) *	Max[(2)-(3),0]	(5)	-(3 Total),0]	((4 Total)]	(8) = (3)+(7)
1	Individual annuity w/ no GLWB	95.0	91.0	95.0	-			-	95.0
2	Indexed annuity w/ low benefit GLWB	92.0	98.0	92.0	6.0			6.3	98.3
3	Indexed annuity w/ medium benefit GLWB	90.0	104.0	90.0	14.0			14.7	104.7
4	Indexed annuity w/ high benefit GLWB	88.0	111.0	88.0	23.0			24.1	112.1
Total		365.0	404.0	365.0	43.0	410.0	45.0	45.0	410.0

\* MAV for Payout Annuity contracts equals Max[(1), (2)]. MAV for Account Value Based Annuity contracts equals (1) if any, otherwise zero.

Table 12.1.B: Hypothetical Sample Allocation of Aggregate Reserve: Group B, Payout Annuity Contracts that do not have Cash Surrender Values

Contract	Example Product Type	CSV (1)	Scenario APV (2)	Minimum Allocation Value (MAV) (3) *	Excess (floored) of Scenario APV over MAV (4) =	Aggregate Reserve CTE 70 (5)	Excess of Aggregate Reserve over Aggregate MAV (6) = Max[(5 Total) -(3 Total),0]	Allocated Excess Reserve (7) = (3) x [(6 Total)/ (3 Total)] **	Total Contract Level Reserve (8) = (3)+(7)
					Max[(2)-(3),0]		-(3 Total),0]	[(6 Total)/ (3 Total)] **	
1	Fixed Life Contingent payout annuity	-	91.0	91.0	-			1.4	92.4
2	Fixed Life Contingent payout annuity	-	111.0	111.0	-			1.6	112.6
3	Fixed Non-life Contingent payout annuity	-	98.0	98.0	-			1.5	99.5
4	Fixed Non-life Contingent payout annuity	-	104.0	104.0	-			1.5	105.5
Total		-	404.0	404.0	-	410.0	6.0	6.0	410.0

\* MAV for Payout Annuity contracts equals Max[(1), (2)]. MAV for Account Value Based Annuity contracts equals (1) if any, otherwise zero.

\*\* Because all contracts have an excess Scenario APV of 0, the AER is allocated in proportion to MAV.

**Guidance Note:** The Scenario actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the Scenario APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

## VM-V: Statutory Maximum Valuation Interest Rates for Formulaic Reserves

### 1. Income Annuities

#### A. Purpose and Scope

1. These requirements define for single premium immediate annuity contracts and other similar contracts, certificates and contract features the statutory maximum valuation interest rate that complies with Model #820. These are the maximum interest rate assumption requirements to be used in the CARVM and for certain contracts, the CRVM. These requirements do not preclude the use of a lower valuation interest rate assumption by the company if such assumption produces statutory reserves at least as great as those calculated using the maximum rate defined herein.
2. The following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits arising from variable annuities and all contracts not passing the SET covered by Sections 1 through 13 of VM-22, are covered in VM-V:
  - a. Immediate annuity contracts issued after Dec. 31, 2017;
  - b. Deferred income annuity contracts issued after Dec. 31, 2017;
  - c. Structured settlements in payout or deferred status issued after Dec. 31, 2017;
  - d. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued after Dec. 31, 2017;



- e. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued during 2017, for fixed payouts commencing after Dec. 31, 2018, or, at the option of the company, for fixed payouts commencing after Dec. 31, 2017;
- f. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest), issued after Dec. 31, 2017;
- g. Fixed income payment streams, attributable to contingent deferred annuities (CDAs) issued after Dec. 31, 2017, once the underlying contract funds are exhausted;
- h. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts issued after Dec. 31, 2017, once the contract funds are exhausted; and
- i. Certificates with premium determination dates after Dec. 31, 2017, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders benefits upon their retirement.

**Guidance Note:** For VM-V Section 1.A.2.d, Section 1.A.2.e, Section 1.A.2.f and Section 1.A.2.h above, there is no restriction on the type of contract that may give rise to the benefit.

- 3. Exemptions:
  - a. With the permission of the domiciliary commissioner, for the categories of annuity contracts, certificates and/or contract features in scope as outlined in VM-V Section 1.A.2.d, Section 1.A.2.e, Section 1.A.2.f, Section 1.A.2.g or Section 1.A.2.h, the company may use the same maximum valuation interest rate used to value the payment stream in accordance with the guidance applicable to the host contract. In order to obtain such permission, the company must demonstrate that its investment policy and practices are consistent with this approach.
- 4. The maximum valuation interest rates for the contracts, certificates and contract features within the scope of VM-V Section 1 supersede those described in Appendix VM-A and Appendix VM-C, but they do not otherwise change how those appendices are to be interpreted. In particular, *Actuarial Guideline IX-B—Clarification of Methods Under Standard Valuation Law for Individual Single Premium Immediate Annuities, Any Deferred Payments Associated Therewith, Some Deferred Annuities and Structured Settlements Contracts* (AG-9-B) (see VM-C) provides guidance on valuation interest rates and is, therefore, superseded by these requirements for contracts, certificates and contract features in scope. Likewise, any valuation interest rate references in *Actuarial Guideline IX-C—Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives Under Individual Single Premium Immediate Annuities* (AG-9-C) (see VM-C) are also superseded by these requirements.

## B. Definitions

- 1. The term “reference period” means the length of time used in assigning the Valuation Rate Bucket for the purpose of determining the statutory maximum valuation interest rate and is determined as follows:
  - a. For contracts, certificates or contract features with life contingencies and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the earlier of: i) the date of the last non-life-contingent payment under the contract, certificate or contract feature; and ii) the date of the first life-contingent payment under the contract, certificate or contract feature, or

- b. For contracts, certificates or contract features with no life-contingent payments and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the date of the last non-life-contingent payment under the contract, certificate or contract feature, or
- c. For contracts, certificates or contract features where the payments are not substantially similar, the actuary should apply prudent judgment and select the Valuation Rate Bucket with Macaulay duration that is a best fit to the Macaulay duration of the payments in question.

**Guidance Note:** Contracts with installment refunds or similar features should consider the length of the installment period calculated from the premium determination date as the non-life contingent period for the purpose of determining the reference period.

**Guidance Note:** The determination in VM-V Section 1.B.1.c above shall be made based on the materiality of the payments that are not substantially similar relative to the life-contingent payments.

- 2. The term “jumbo contract” means a contract with an initial consideration equal to or greater than \$250 million. Considerations for contracts issued by an insurer to the same contract holder within 90 days shall be combined for purposes of determining whether the contracts meet this threshold.

**Guidance Note:** If multiple contracts meet this criterion in aggregate, then each contract is a jumbo contract.

- 3. The term “non-jumbo contract” means a contract that does not meet the definition of a jumbo contract.
- 4. The term “premium determination date” means the date as of which the valuation interest rate for the contract, certificate or contract feature being valued is determined.
- 5. The term “initial age” means the age of the annuitant as of his or her age last birthday relative to the premium determination date. For joint life contracts, certificates or contract features, the “initial age” means the initial age of the younger annuitant. If a contract, certificate or contract feature for an annuitant is being valued on a standard mortality table as an impaired annuitant, “initial age” means the rated age. If a contract, certificate or contract feature is being valued on a substandard mortality basis, “initial age” means an equivalent rated age.
- 6. The term “Table X spreads” means the prescribed VM-V Section 1 current market benchmark spreads for the quarter prior to the premium determination date, as published on the Industry tab of the NAIC website. The process used to determine Table X spreads is the same as that specified in VM-20 Appendix 2.D for Table F, except that JP Morgan and Bank of America bond spreads are averaged over the quarter rather than the last business day of the month.
- 7. The term “expected default cost” means a vector of annual default costs by weighted average life. This is calculated as a weighted average of the VM-20 Table A prescribed annual default costs published on the Industry tab of the NAIC website in effect for the quarter prior to the premium determination date, using the prescribed portfolio credit quality distribution as weights.
- 8. The term “expected spread” means a vector of spreads by weighted average life. This is calculated as a weighted average of the Table X spreads, using the prescribed portfolio credit quality distribution as weights.

9. The term “prescribed portfolio credit quality distribution” means the following credit rating distribution:
- a. 5% Treasuries
  - b. 15% Aa bonds (5% Aa1, 5% Aa2, 5% Aa3)
  - c. 40% A bonds (13.33% A1, 13.33% A2, 13.33% A3)\*
  - d. 40% Baa bonds (13.33% Baa1, 13.33% Baa2, 13.33% Baa3)\*
- \*40%/3 is used unrounded in the calculations.

C. Determination of the Statutory Maximum Valuation Interest Rate

1. Valuation Rate Buckets

- a. For the purpose of determining the statutory maximum valuation interest rate, the contract, certificate or contract feature being valued must be assigned to one of four Valuation Rate Buckets labeled A through D.
- b. If the contract, certificate or contract feature has no life contingencies, the Valuation Rate Bucket is assigned based on the length of the reference period (RP), as follows:

**Table 3-1: Assignment to Valuation Rate Bucket by Reference Period Only**

RP ≤ 5 Years	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
A	B	C	D

- c. If the contract, certificate or contract feature has life contingencies, the Valuation Rate Bucket is assigned based on the length of the RP and the initial age of the annuitant, as follows:

**Table 3-2: Assignment to Valuation Rate Bucket by Reference Period and Initial Age**

Initial Age	RP ≤ 5Y	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
90+	A	B	C	D
80–89	B	B	C	D
70–79	C	C	C	D
< 70	D	D	D	D

2. Premium Determination Dates

- a. The following table specifies the decision rules for setting the premium determination date for each of the contracts, certificates and contract features listed in Section 1:

**Table 3-3: Premium Determination Dates**

Section	Item Description	Premium determination date
A.2.a	Immediate annuity	Date consideration is determined and committed to by contract holder
A.2.b	Deferred income annuity	Date consideration is determined and committed to by contract holder
A.2.c	Structured settlements	Date consideration is determined and committed to by contract holder
A.2.d and A.2.e	Fixed payout annuities resulting from settlement options or annuitizations from host contracts	Date consideration for benefit is determined and committed to by contract holder
A.2.f	Supplementary contracts	Date of issue of supplementary contract
A.2.g	Fixed income payment streams from CDAs, AV becomes 0	Date on which AV becomes 0
A.2.h	Fixed income payment streams from guaranteed living benefits, AV becomes 0	Date on which AV becomes 0
A.2.i	Group annuity and related certificates	Date consideration is determined and committed to by contract holder

**Guidance Note:** For the purposes of the items in the table above, the phrase “date consideration is determined and committed to by the contract holder” should be interpreted by the company in a manner that is consistent with its standard practices. For some products, that interpretation may be the issue date or the date the premium is paid.

b. Immaterial Change in Consideration

If the premium determination date is based on the consideration, and if the consideration changes by an immaterial amount (defined as a change in present value of less than 10% and less than \$1 million) subsequent to the original premium determination date, such as due to a data correction, then the original premium determination date shall be retained. In the case of a group annuity contract where a single premium is intended to cover multiple certificates, certificates added to the contract after the premium determination date that do not trigger the company’s right to reprice the contract shall be treated as if they were included in the contract as of the premium determination date.

3. Statutory Maximum Valuation Interest Rate

- a. For a given contract, certificate or contract feature, the statutory maximum valuation interest rate is determined based on its assigned Valuation Rate Bucket (VM-V Section

1.C.1) and its Premium Determination Date (VM-V Section 1.C.2) and whether the contract associated with it is a jumbo contract or a non-jumbo contract.

- b. Statutory maximum valuation interest rates for jumbo contracts are determined and published daily by the NAIC on the Industry tab of the NAIC website. For a given premium determination date, the statutory maximum valuation interest rate is the daily statutory maximum valuation interest rate published for that premium determination date.
- c. Statutory maximum valuation interest rates for non-jumbo contracts are determined and published quarterly by the NAIC on the Industry tab of the NAIC website by the third business day of the quarter. For a given premium determination date, the statutory maximum valuation interest rate is the quarterly statutory maximum valuation interest rate published for the quarter in which the premium determination date falls.
- d. Quarterly Valuation Rate:

For each Valuation Rate Bucket, the quarterly valuation rate is defined as follows:

$$I_q = R + S - D - E$$

Where:

- a. R is the reference rate for that Valuation Rate Bucket (defined in VM-V Section 1.C.4);
  - b. S is the spread rate for that Valuation Rate Bucket (defined in VM-V Section 1.C.5);
  - c. D is the default cost rate for that Valuation Rate Bucket (defined in VM-V Section 1.C.6);
- and
- d. E is the spread deduction defined as 0.25%.
- e. Daily Valuation Rate:

For each Valuation Rate Bucket, the daily valuation rate is defined as follows:

$$I_d = I_q + C_{d-1} - C_q$$

Where:

- a.  $I_q$  is the quarterly valuation rate for the calendar quarter preceding the business day immediately preceding the premium determination date;
- b.  $C_{d-1}$  is the daily corporate rate (defined in VM-V Section 1.C.7) for the business day immediately preceding the premium determination date; and
- c.  $C_q$  is the average daily corporate rate (defined in VM-V Section 1.C.8) corresponding to the same period used to develop  $I_q$ .

For jumbo contracts, the daily statutory maximum valuation interest rate is the daily valuation rate ( $I_d$ ) rounded to the nearest one-hundredth of one percent (1/100 of 1%).

#### 4. Reference Rate

Reference rates are updated quarterly as described below:

- a. The “quarterly Treasury rate” is the average of the daily Treasury rates for a given maturity over the calendar quarter prior to the premium determination date. The quarterly Treasury rate is downloaded from <https://fred.stlouisfed.org>, and is rounded to two decimal places.
- b. Download the quarterly Treasury rates for two-year, five-year, 10-year and 30-year U.S. Treasuries.
- c. The reference rate for each Valuation Rate Bucket is calculated as the weighted average of the quarterly Treasury rates using Table 1 weights (defined in VM-V Section 1.C.9) effective for the calendar year in which the premium determination date falls.

5. Spread

The spreads for each Valuation Rate Bucket are updated quarterly as described below:

- a. Use the Table X spreads from the NAIC website for WALs two, five, 10 and 30 years only to calculate the expected spread.
- b. Calculate the spread for each Valuation Rate Bucket, which is a weighted average of the expected spreads for WALs two, five, 10 and 30 using Table 2 weights (defined in Section 3.I) effective for the calendar year in which the premium determination date falls.

6. Default costs for each Valuation Rate Bucket are updated annually as described below:

- a. Use the VM-20 prescribed annual default cost table (Table A) in effect for the quarter prior to the premium determination date for WAL two, WAL five and WAL 10 years only to calculate the expected default cost. Table A is updated and published annually on the Industry tab of the NAIC website during the second calendar quarter and is used for premium determination dates starting in the third calendar quarter.
- b. Calculate the default cost for each Valuation Rate Bucket, which is a weighted average of the expected default costs for WAL two, WAL five and WAL 10, using Table 3 weights (defined in VM-V Section 1.C.9) effective for the calendar year in which the premium determination date falls.

7. Daily Corporate Rate

Daily corporate rates for each valuation rate bucket are updated daily as described below:

- a. Each day, download the Bank of America Merrill Lynch U.S. corporate effective yields as of the previous business day’s close for each index series shown in the sample below from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from the table below\]](https://research.stlouisfed.org/fred2/series/[replace with series name from the table below]).

**Table 3-4: Index Series Names**

Maturity	Series Name
----------	-------------

1Y – 3Y	BAMLC1A0C13YEY
3Y – 5Y	BAMLC2A0C35YEY
5Y – 7Y	BAMLC3A0C57YEY
7Y – 10Y	BAMLC4A0C710YEY
10Y – 15Y	BAMLC7A0C1015YEY
15Y+	BAMLC8A0C15PYEY

- b. Calculate the daily corporate rate for each valuation rate bucket, which is a weighted average of the Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in VM-V Section 1.C.9) effective for the calendar year in which the business date immediately preceding the premium determination date falls.

8. Average Daily Corporate Rate

Average daily corporate rates are updated quarterly as described below:

- a. Download the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields for each index series shown in Section 3.G.1 from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from VM-V Section 1.C.7.a\]](https://research.stlouisfed.org/fred2/series/[replace with series name from VM-V Section 1.C.7.a]).
- b. Calculate the average daily corporate rate for each valuation rate bucket, which is a weighted average of the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in VM-V Section 1.C.9) for the same calendar year as the weight tables (i.e. Tables 1, 2, and 3) used in calculating  $I_q$  in VM-V Section 1.C.3.e.

9. Weight Tables 1 through 4

The system for calculating the statutory maximum valuation interest rates relies on a set of four tables of weights that are based on duration and asset/liability cash-flow matching analysis for representative annuities within each valuation rate bucket. A given set of weight tables is applicable to the calculations for every day of the calendar year.

In the fourth quarter of each calendar year, the weights used within each valuation rate bucket for determining the applicable valuation interest rates for the following calendar year will be updated using the process described below. In each of the four tables of weights, the weights in a given row (valuation rate bucket) must add to exactly 100%.

Weight Table 1

The process for determining Table 1 weights is described below:

- a. Each valuation rate bucket has a set of representative annuity forms. These annuity forms are as follows:

- i. Bucket A:
    - a) Single Life Annuity age 91 with 0 and five-year certain periods.
    - b) Five-year certain only.
  - ii. Bucket B:
    - a) Single Life Annuity age 80 and 85 with 0, five-year and 10-year certain periods.
    - b) 10-year certain only.
  - iii. Bucket C:
    - a) Single Life Annuity age 70 with 0 and 15-year certain periods.
    - b) Single Life Annuity age 75 with 0, 10-year and 15-year certain periods.
    - c) 15-year certain only.
  - iv. Bucket D:
    - a) Single Life Annuity age 55, 60 and 65 with 0 and 15-year certain periods.
    - b) 25-year certain only.
- b. Annual cash flows are projected assuming annuity payments are made at the end of each year. These cash flows are averaged for each valuation rate bucket across the annuity forms for that bucket using the statutory valuation mortality table in effect for the following calendar year for individual annuities for males (ANB).
  - c. The average daily rates in the third quarter for the two-year, five-year, 10-year and 30-year U.S. Treasuries are downloaded from <https://fred.stlouisfed.org> as input to calculate the present values in Step d.
  - d. The average cash flows are summed into four time period groups: years 1–3, years 4–7, years 8–15 and years 16–30. (**Note:** The present value of cash flows beyond year 30 are discounted to the end of year 30 and included in the years 16–30 group. This present value is based on the lower of 3% and the 30-year Treasury rate input in Step c.)
  - e. The present value of each summed cash-flow group in Step d is then calculated by using the Step 3 U.S. Treasury rates for the midpoint of that group (and using the linearly interpolated U.S. Treasury rate when necessary).
  - f. The duration-weighted present value of the cash flows is determined by multiplying the present value of the cash-flow groups by the midpoint of the time period for each applicable group.
  - g. Weightings for each cash-flow time period group within a valuation rate bucket are calculated by dividing the duration weighted present value of the cash flow by the sum of the duration weighted present value of cash flow for each valuation rate bucket.

Weight Tables 2 through 4

Weight Tables 2 through 4 are determined using the following process:



- i. Table 2 is identical to Table 1.
- ii. Table 3 is based on the same set of underlying weights as Table 1, but the 10-year and 30-year columns are combined since VM-20 default rates are only published for maturities of up to 10 years.
- iii. Table 4 is derived from Table 1 as follows:
  - a) Column 1 of Table 4 is identical to column 1 of Table 1.
  - b) Column 2 of Table 4 is 50% of column 2 of Table 1.
  - c) Column 3 of Table 4 is identical to column 2 of Table 4.
  - d) Column 4 of Table 4 is 50% of column 3 of Table 1.
  - e) Column 5 of Table 4 is identical to column 4 of Table 4.
  - f) Column 6 of Table 4 is identical to column 4 of Table 1.

10. Group Annuity Contracts

For a group annuity purchased under a retirement or deferred compensation plan (VM-V Section 1.A.2.i), the following apply:

- a. The statutory maximum valuation interest rate shall be determined separately for each certificate, considering its premium determination date, the certificate holder's initial age, the reference period corresponding to its form of payout and whether the contract is a jumbo contract or a non-jumbo contract.

**Guidance Note:** Under some group annuity contracts, certificates may be purchased on different dates.

- b. In the case of a certificate whose form of payout has not been elected by the beneficiary at its premium determination date, the statutory maximum valuation interest rate shall be based on the reference period corresponding to the normal form of payout as defined in the contract or as is evidenced by the underlying pension plan documents or census file. If the normal form of payout cannot be determined, the maximum valuation interest rate shall be based on the reference period corresponding to the annuity form available to the certificate holder that produces the most conservative rate.

**Guidance Note:** The statutory maximum valuation interest rate will not change when the form of payout is elected.

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## RESERVING CATEGORY DEFINITIONS

The Term “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities. For the purposes of the “Payout Annuity Reserving Category”, Longevity Reinsurance shall be excluded from the following categories of contracts, certificates and contract features.

:

1. Immediate annuity contracts;
2. Deferred income annuity contracts;
3. Structured settlements in payout or deferred status;
4. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
5. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
6. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;
7. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
8. Pension Risk Transfer Annuities.

The term “Longevity Reinsurance Reserving Category” refers to Longevity Reinsurance under the definition provided in [VM-01 or VM-22 Section 1.d of the Valuation Manual].

The term “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category” or “Longevity Reinsurance Reserving Category”.

***Drafting Note:*** Intent is to not permit aggregation between longevity reinsurance and other contracts for VM-22 PBR calculations.

Section 4: Determination of SR

A. Projection of Accumulated Deficiencies

1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9. The company shall project cash flows including the following:

- a. Gross premium received by the company from the contract holder (including any due premiums as of the projected start date). For purposes of Longevity Reinsurance, net premium shall be used in the projection and defined as the gross premium multiplied by a “K-factor,” where the K-factor is determined as:
  - i. The present value of the expected future benefits at contract inception using the prudent estimate assumptions determined at contract inception and an interest rate equal to the prescribed interest rate under VM-A and VM-C, divided by item ii immediately below.
  - ii. The present value of the expected future gross premiums at contract inception using the prudent estimate assumptions determined at contract inception and an interest rate equal to the prescribed interest rate under VM-A and VM-C.
  - iii. The resulting amount is capped at 1, in other words the application of the K-factor shall not result in the net premium exceeding the gross premium.

<p><b>Guidance Note:</b> If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.</p>
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- b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses). For purposes of Longevity Reinsurance, it is not expected that any such other revenues will apply. To the extent there are other revenues, they should be included with item ii under a. immediately above so that the calculation of the K-factor includes all expected future revenues from the contract holder.
- c. All material benefits projected to be paid to contract holders—including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

- d. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.
- e. Insurance company expenses (including overhead and maintenance expense), commissions and other acquisition expenses associated with business inforce as of the valuation date.
- f. Cash flows associated with any reinsurance.
- g. Cash flows from hedging instruments as described in Section 4.A.4.
- h. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.

If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.



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August 11, 2022

Mr. Ben Slutsker, Chair  
Valuation Manual (VM)-22 (A) Subgroup of the Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners

Re: Comments on the recently exposed VM-22 Longevity Reinsurance Proposal

Dear Mr. Slutsker,

The American Academy of Actuaries<sup>1</sup> Annuity Reserves and Capital Work Group (“ARCWG”) appreciates the opportunity to comment on the recently exposed VM-22 Longevity Reinsurance Proposal (“the Proposal”) and is pleased to provide the following comments.

ARCWG has identified several concerns with the proposal as drafted and proposes modifications in this letter to address them. In summary, ARCWG notes that:

- a.) Establishing a separate reserve category for Longevity Reinsurance is unnecessary and inconsistent with the principles outlined in the VM-22 PBR Framework as VM-22 principles allow for the aggregation of policies when utilized as part of an integrated risk management system.
- b.) While any category-level flooring of reserves is inconsistent with the principles outlined in the VM-22 PBR Framework, flooring the final reserve at zero for the Longevity Reinsurance reserve category should be sufficient to achieve the outcomes stated in the Proposal without the need for a K-factor approach. ARCWG notes other concerns with a K-factor approach including:
  - i. Using a locked-in K-factor may produce unexpected and unintended outcomes in the stochastic reserve calculation.
  - ii. Performing a contract-by-contract K-factor calculation does not align the reserve calculation with how many companies monitor and manage the risk associated with these contracts in practice.
  - iii. It is unclear how the K-factor approach would work for nonproportional/stop-loss longevity reinsurance coverages.

While ARCWG does not support application of a K-factor approach, it has also provided some technical considerations if the NAIC adopts this approach, including the addition of expenses in the calculation.

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

In addition to these comments for the Longevity Reinsurance proposal specifically, ARCWG has recommendations regarding changes to the definitions and related elements of the VM-22 Framework to clarify points that were raised as part of recent NAIC discussions and as part of ARCWG discussions regarding the Longevity Reinsurance proposal. These recommendations are attached to this letter.

*Review of Relevant PBR Principles and the VM-22 Framework*

While acknowledging the view expressed at NAIC discussions regarding the implementation of multiple reserve categories, ARCWG notes that, in its view, the VM-22 PBR Framework guidance that the reserve should be determined in aggregate across various groups of contracts as a single model segment remains appropriate in situations where the company manages the risks for contracts included in the model segment on an integrated basis, taking into account factors including whether the contracts are part of the same portfolio, part of the same integrated risk management system, administered/managed together, etc.

ARCWG is deeply committed to the principles underlying the fixed annuity principle-based reserving (PBR) framework exposed on July 16, 2021 (“VM-22 PBR Framework”). Principle 2 of the VM-22 PBR Framework lays out several important points which are relevant for evaluating the Proposal, including the principle that the analysis should be performed “in aggregate (subject limitations related to contractual provisions) to allow the natural offset of risks within a given scenario” and that the calculation methodology should use “a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model....”

Further, Principle 3 of the VM-22 PBR Framework states that “conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the stochastic reserve at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes.” ARCWG notes that this principle implies the use of a probability model for future outcomes that reflects all relevant historical and current experience information, including post-inception experience to the extent such experience is available, credible, and meaningfully different than at-inception anticipated experience.

*Projection of Accumulated Deficiencies and the K-Factor Approach*

Based upon ARCWG’s members reading of the Proposal, the approach used to determine the “K-factor” would be performed on a contract-by-contract basis for blocks of Longevity Reinsurance contracts that contain multiple individual reinsurance contracts and would produce net premium schedules that are locked-in from each reinsurance contract’s inception. This effectively means that gross premiums in excess of the locked-in net premium schedule would be excluded from the reserve projections, even though such contractually guaranteed premiums would be available to the company to offset any unfavorable deviations in experience post-inception.

This restriction appears inconsistent with Principle 2 and with the aggregation concepts included in the VM-22 PBR Framework in that it would restrict reflection of a portion of the “projected income” related to the Longevity Reinsurance contracts in the model while fully reflecting the associated benefit and expense items. It would also restrict the natural offset of risks among multiple Longevity Reinsurance contracts within the same block of jointly managed Longevity Reinsurance contracts.

Locking-in assumptions used for any portion of the reserve calculation also appears inconsistent with Principle 3, since using locked-in assumptions or net premium factors would be unlikely to



result in a Conditional Tail Expectation (“CTE”) calculation that achieves the target level of confidence based on current (as of the valuation date) expectations of future outcomes.

Finally, it is unclear how well the K-factor approach would work for nonproportional or stop-loss longevity reinsurance contracts, since the risk of future claim payments at contract inception is often purposefully designed to be remote but may grow significantly over the life of the agreement.

If the NAIC applies a K-factor approach, ARCWG notes several unintuitive technical consequences that may emerge, including:

- a.) For a newly issued contract, the K-factor approach would be designed to produce zero initial reserve on a deterministic basis, but the proposal would be unlikely to produce this outcome for at least two reasons:
  - i. Maintenance expenses are not included in the K-factor calculation but are included in the scenario projections used to determine the stochastic reserve.
  - ii. Under a stochastic projection framework using a conditional tail expectation-based reserve calculation, initial reserves may be non-zero due to the differing asset assumptions within each scenario.
- b.) The K-factor would not be adjusted over time to reflect deviation of current prudent estimate assumptions vs. at-inception prudent estimate assumptions or for changes in economic conditions. This situation could produce unintuitive outcomes for at least three reasons:
  - i. If credible contract experience post-issue is favorable to the assuming company (e.g., supports higher future prudent estimate mortality than the at-inception prudent estimate assumptions), then locking-in the K-factor at inception may cause reserves to be quite low or potentially negative, which appears inconsistent with the intent of using a K-factor approach
  - ii. If credible contract experience post-issue is unfavorable to the assuming company (e.g., supports lower future prudent estimate mortality than the at-inception prudent estimate assumptions), then locking-in the K-factor at inception at a value less than 100% may cause reserves to be overstated since the net premiums would be arbitrarily reduced from the actual gross premium received in future periods, which are available to offset unfavorable experience.
  - iii. The initial interest rates used in the stochastic projection will fluctuate over time, yet the present value calculation used to determine the K-factor uses a locked-in rate. This could produce reserves either higher or lower than if the K-factor were periodically reset, which would better reflect the investment risk to which the company is actually exposed.

#### Reserve Categories

Regarding the creation of a separate reserving category and contract-by-contract reserve calculation for Longevity Reinsurance, ARCWG notes that no allowance is made for considering how the company manages the risks associated with Longevity Reinsurance contracts. While this may be consistent with the VM-22 PBR Framework for certain companies who manage their Longevity Reinsurance contracts on a standalone basis, ARCWG notes it would be more appropriate for companies to define their model segments for performing the projections used to determine reserves in a manner that reflects how the contracts are actually managed in practice, in alignment with Principle 2.

For certain companies who jointly manage the risks and support investments for their Longevity Reinsurance contracts with other fixed annuity business, this may imply that Longevity Reinsurance should be aggregated with other Payout contracts in-scope for the VM-22 PBR Framework when performing these projections. For companies who manage reinsurance contracts on a standalone basis, it may instead imply that Longevity Reinsurance should be modeled on a standalone basis or potentially even on a standalone contract-by-contract basis. Separating groups of policies that are jointly managed in practice strictly for reserving purposes may lead to counterintuitive, noneconomic outcomes and may reduce the incentives for companies to pursue well-balanced books of business with natural risk offsets.

Suggested Modifications

In summary, ARCWG suggests the following modifications to the Proposal:

- a.) Remove the K-factor concept and instead include all contractual premium, benefit, and expenses cashflows outlined in the existing VM-22 PBR Framework, consistent with all other in-scope products. Using current (as of the valuation date) prudent estimate assumptions should produce reserves for companies where future premium cash flows are not sufficient to fund future expected benefits at a level of conservatism consistent with the overall CTE70 reserve objective outlined in the VM-22 PBR Framework.
- b.) While ARCWG notes that any category-level flooring of reserves is inconsistent with the principles outlined in the VM-22 PBR Framework, if the NAIC applies a floor to Longevity Reinsurance contracts as a standalone category, then flooring the final reserve at zero for this reserve category should be sufficient to address concerns regarding the total reserves held for products with ongoing premiums without the need for a K-factor or scenario-by-scenario flooring of reserves.
- c.) While ARCWG supports aggregation of all contracts according to the risk management, investment, and management/administration practices of the company, if the NAIC includes Longevity Reinsurance contracts as a separate reserve category, then sub-segmentation of the Longevity Reinsurance category should be subject only to the general guidance provided in the VM-22 PBR Framework. ARCWG does not support contract-level sub-segmentation or reserve flooring at the contract level, except for those companies who follow a contract-by-contract approach to risk management, investment management, contract administration, etc. If concerns remain regarding the impact of contract-level dynamics within the Longevity Reinsurance reserving category, then contract-level disclosures could be considered as an alternative.

While ARCWG does not support the application of a contract-by-contract reserve flooring approach for the reasons outlined above, ARCWG notes that certain complications could arise in the event of the insolvency of an assuming reinsurer to the extent that reserves are floored at zero only at the category level (e.g., if a contract-by-contract allocation of reserves were required as part of the insolvency proceedings). We recommend that regulators review any potential implications of reserve flooring, in the event of the insolvency of an assuming reinsurer, in evaluating this recommendation.

Thank you for your consideration of these comments. Please contact Amanda Barry-Moilanen ([barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org)), the Academy's life policy analyst, with any questions on this comment letter.

Sincerely,

Chris Conrad, MAAA, FSA  
Chairperson  
Annuity Reserves and Capital Work Group  
American Academy of Actuaries

## Recommended Clarifications on Definitions and Other Framework Elements

### Section 1.D.

- **Longevity Insurance/Reinsurance**  
*An agreement, ~~typically a reinsurance arrangement~~ covering benefits provided under one or more group or individual annuity contracts or covering benefits provided under one or more retirement plans, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants or retirement plan participants under one or more immediate or deferred payout annuity contracts. ~~A common example is participants in one or more underlying retirement plans. The coverage provided under these agreements may be either proportional or non-proportional and may take a variety of structural forms. The key defining characteristic for this group of contracts is that longevity risk is the primary risk transferred through the agreement, with any other transferred risks being ancillary or incidental.~~*
- ~~Typically~~*In the case of reinsurance, a common structure is that the reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, ~~a pre-agreed amount per annuitant~~ the benefit payment amount per annuitant may be limited to a pre-agreed amount), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these agreements, longevity risk may be transferred on either a permanent basis or for a pre-specified period of time, and these agreements may or may not permit early termination.*
- ~~Reinsurance Agreements~~*agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition.*
- ~~In particular, contracts~~*Agreements under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.*
- **Pension Risk Transfer (PRT) Annuity**  
*An annuity, ~~typically a~~ A group annuity, issued by an insurance company or assumed by an insurance company under a reinsurance agreement that transfers all significant risks ~~contract or reinsurance agreement, issued by an insurance company~~ providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. ~~Typically~~*For these contracts, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also ~~asset risks~~ all other significant risks, including significant asset risks (e.g., credit risk and reinvestment risk). In the case of reinsurance,**

if only the longevity risk associated with the underlying Pension Risk Transfer Annuity is transferred, such an agreement would instead be considered Longevity Insurance/Reinsurance as defined above.

- **Single Premium Immediate Annuity (SPIA)**

*An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months from the issue date. Such annuities may be purchased by individuals directly or as a settlement option under certain group annuity contracts that permit individual purchases (e.g., contracts funding benefits provided under defined contribution retirement plans). In the case of reinsurance, only those agreements where the underlying direct contract is a Single Premium Immediate Annuity and all significant risks, including significant asset risks (e.g., credit risk and reinvestment risk), are transferred to the assuming company through the agreement would meet this definition. In the case of reinsurance, if only the longevity risk associated with the underlying Single Premium Immediate Annuity is transferred, such an agreement would instead be considered Longevity Insurance/Reinsurance as defined above.*

**Section 2.A.** *Subject to the requirements of Sections 1 to 13 of VM-22 are annuity contracts, certificates and contract features issued on or after 1/1/2024, whether group or individual, including both life contingent and term-certain-only, directly written or assumed through reinsurance ~~issued on or after 1/1/2024~~, with the exception of contracts or benefits listed below.*

**Section 5.A.2.c.** *An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement. To the extent that credible, contract or treaty-specific experience is available (e.g., for reinsurance assumed on a Pension Risk Transfer Annuity where the underlying pension plan has provided credible, plan-specific data to the ceding and assuming insurers), the assuming company may use such data in addition to or in place of the assuming company's experience for the business segment generally.*



**Brian Bayerle**  
Senior Actuary

August 19, 2022

Ben Slutsker  
Chair, NAIC Valuation Manual (VM)-22 (A) Subgroup (Subgroup)

Seong-min Eom  
Chief Actuary, New Jersey Dept of Banking & Insurance

Re: VM-22 Longevity Reinsurance Proposal

Dear Ben and Seong-min:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit feedback on the longevity reinsurance proposal for VM-22.

Consistent with our prior comments, ACLI favors longevity reinsurance reserves to be principles-based with prudent margins included in the assumptions. For this reason, we have several concerns about the proposal:

- A separate reserving category for longevity reinsurance moves the framework further away from alignment with how companies actually manage their business. Additionally, there may be implications for any future treaties that combine business that meets the definition of longevity reinsurance together with other products.
- There are comparable products in the marketplace that exhibit similar cashflows and overlapping risk profiles as longevity reinsurance. Separate requirements could ultimately disadvantage longevity reinsurance. Further, such an approach may exacerbate differences between ceding and assuming company treatment.
- The definition of “longevity reinsurance” and the SSAP 61R requirements creates challenges to identify what would go into this reserving category versus other categories containing analogous risks.
- Net premium ratios and net premiums go against Principle 2 of VM-22 and the idea that a company should be modeling all their cashflows (and not arbitrarily excluding some).

One of the stated objectives of this proposal is to address the possibility of negative reserves. However, the net premium reserve methodology will not prevent negative reserves. We believe alternative solutions could better meet regulators’ concerns and the spirit of a principle-based framework (such as a floor of zero), and we wish to work with regulators to craft a better solution.

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American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

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The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI’s member companies are dedicated to protecting consumers’ financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI’s 280 member companies represent 94 percent of industry assets in the United States.

[acll.com](http://acll.com)

Thank you for your consideration.

A handwritten signature in cursive script, appearing to read "B. Banerji". The signature is written in black ink on a white background.

cc: Reggie Mazyck, NAIC



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# Memo

**To:** Ben Slutsker, Chair, VM-22 (A) Subgroup

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**From:** Tricia Matson, Partner

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**Date:** August 24, 2022

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**Subject:** RRC comments regarding the VM-22 Longevity Reinsurance Proposal

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## **Background**

The VM-22 (A) Subgroup exposed for comment a proposal for treatment of Longevity Reinsurance in VM-22. RRC appreciates the opportunity to offer our comments. Should you have any questions, we would be glad to discuss our comments with you and the VM-22 (A) Subgroup members.

## **RRC Comments**

- We have the following general comments on the Considerations:
  - We generally agree with including separate, specific considerations for Longevity Reinsurance in VM-22 in light of its unique characteristics relative to many other products in the scope of VM-22.
- We have the following specific comments:
  - The use of a “k-factor” approach appears reasonable within the objectives of a statutory reporting framework.
  - In item A.1.a.i, we suggest including expenses (in addition to benefits) in the determination of the k factor.
  - In item A.1.f, we suggest clarifying that the “cash flows associated with any reinsurance” do not include the Longevity Reinsurance cash flows (since those are already covered in items a, c, and e.). Perhaps adding “to the extent not already included elsewhere” would address this.

We also suggest that the VM-22 (A) Subgroup consider whether there are other similar types of reinsurance that might warrant similar treatment, for example other non-proportional reinsurance agreements that may result in recognition of significant time 0 profits under the VM-22 framework. To the extent there are, it may make sense to apply a similar approach to those contracts.

Thank you for the opportunity to provide comments on this important initiative. I can be reached at [tricia.matson@riskreg.com](mailto:tricia.matson@riskreg.com)/(860) 305-0701 if you or other VM-22 Subgroup members have any questions.



Draft: 11/15/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
September 21, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Sept. 21, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); and Craig Chupp (VA)

1. Reviewed “Tier 3” Comments in the VM-22 Draft

Slutsker continued the discussion from the Subgroup’s prior meeting of the remaining “Tier Three” comments on the draft of VM-22, Requirements for Principle-Based Reserves for Non-Variable Annuities (VM-22 Draft) (Attachment Twenty-Six-A). He noted a comment from the American Council of Life Insurers (ACLI) that discussed an apparent inconsistency between the policyholder efficiency assumption that allowed for less than 100% efficiency in Section 10.D.8 and the language in Section 6.H.2. that implied 100% efficiency. He said that additional language on policyholder efficiency existed in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, that specified that increasing levels of policyholder efficiency should be assumed over time. Hemphill said that she supports eliminating the contradiction on policyholder efficiency in the VM-22 Draft, being consistent with the efficiency language in other sections of the *Valuation Manual*, and including an example of efficient policyholder behavior. The VM-22 Draft was updated with that direction.

Slutsker introduced a comment from the Texas Department of Insurance (TDI) in Section 10.I.5.b of the VM-22 Draft that questioned why non-guaranteed elements can be excluded if authorized by the board. Hemphill asked the Subgroup if anyone had background on the intention of the language. Hearing none, the Subgroup decided to remove the language but add a drafting note to inquire about the purpose of the language in the VM-22 Draft.

Slutsker said that the TDI had made a comment in Section 11.A.1 of the VM-22 Draft that language should be deleted that referred to unsupported actuarial judgment. Hemphill noted that actuarial judgment is not arbitrary and should always be supportable. Hearing no objections to striking the language, it was removed from the VM-22 Draft.

Slutsker introduced a comment in Section 11.A.4 of the VM-22 Draft from the TDI that questioned how to interpret language that would require risk reclassification for a segment depending on whether it was gross or net of reinsurance. After discussion, the Subgroup decided to remove the language as it was not consistent with VM-21.

Slutsker said that the American Council of Life Insurers (ACLI) commented on Section 11.C.2 of the VM-22 Draft that mortality improvement should be consistent with the underlying tables used based on available experience and subject to appropriate guardrails. He also noted that the TDI made a comment that Section 11.C.2 should only refer to industry mortality. He asked if the ACLI had any objection to the section only referring to industry mortality. Brian Bayerle (ACLI) agreed that it made sense that this section would only refer to industry mortality but would see if the ACLI had any additional comments after reviewing the exposure.

2. Discussed Allocation for Non-Life Contingent Contracts

Barbara Gold (ACLI) walked through the technical specifics of the allocation methodology (Attachment Twenty-Six-B). Slutsker noted that there were originally two options for the allocation in a prior exposure: 1) use the same language as VM-21 where allocation was based on a risk measure for a given contract;

and 2) an allocation based on an actuarial present value (APV). Gold confirmed that the latest language was consistent with option 2 above using APVs. Hemphill noted a concern with different APV definitions in the language between contracts that take the deterministic certification option versus contracts where a stochastic reserve (SR) is calculated. Gold committed to adding language to make it clear that the allocation is intended to be done separately for the deterministic reserve and stochastic reserve.

Slutsker noted a comment that the TDI brought up about how to address contract reserves that are calculated using the direct iteration method. Gold noted that companies using the direct iteration method would need to calculate a net asset earned rate for the scenario with the reserve value closest to, but not greater than, the SR. Hemphill asked that specific instructions be added to the language to specify the allocation methodology for contracts using the direct iteration method.

Slutsker inquired whether any Subgroup members had concerns with moving forward with the allocation language. Hearing no objections, the language is planned to be added to the VM-22 Draft.

### 3. Discussed Fixed Annuity PBR Exemption

Bayerle noted that the Fixed Annuity Principle-Based Reserving (PBR) Exemption (Attachment Twenty-Six-C) is designed to mirror the Life PBR Exemption, with most of the language corresponding line for line. However, Bayerle said that there was some language that was added as requested by state insurance regulators during the Subgroup's April 13 meeting. He said that instead of premiums, the Fixed Annuity PBR Exemption is based off of reserves, with a threshold of \$3 billion and \$6 billion of prior year reserves for individual entities and groups, respectively. Chupp noted that a large difference between the Life PBR Exemption and the current Fixed Annuity PBR Exemption is that the Life PBR Exemption was gross of reinsurance, where the Fixed Annuity PBR Exemption is on a net basis. The Subgroup agreed to start with that discussion during its next meeting.

Having no further business, the VM-22 (A) Subgroup adjourned

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/09 21/9\_21 VM-22 Minutes.docx

**Comment Categories:**

- Tier 1: **Key Decision Points** – Discuss first
- Tier 2: **High Substance Edits** – Discuss second
- Tier 3: **Moderate Substance Edits** – Discuss third
- Tier 4: **Noncontroversial or Low Substance Edits** – Will expose and only discuss upon comment

**VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities**

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**Commented [CD1]:** Please clarify which version (i.e., effective date) of the VM was used for the comparison. Before any changes for VM-22 are adopted, a final comparison against the latest version of the VM will need to be performed.

**Commented [VM222R1]:** Final comparison to be made prior to adoption

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Commented [X3]: Note that part of the 2022 VM updates was to replace all instances of "stochastic reserve" with "SR" other than the initial definition in VM-01.

Commented [VM224R3]: Edit to be reflected in next exposure

Valuation Manual Section II | Reserve Requirements

Subsection 2: Annuity Products

- A. This subsection establishes reserve requirements for all contracts classified as annuity contracts as defined in SSAP No. 50 in the AP&P Manual.
- B. Minimum reserve requirements for variable annuity (VA) contracts and similar business, specified in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, shall be those provided by VM-21. The minimum reserve requirements of VM-21 are considered PBR requirements for purposes of the *Valuation Manual*.
- C. Minimum reserve requirements for non-variable fixed annuity contracts issued prior to 1/1/2024 are those requirements as found in VM-A and VM-C as applicable, with the exception of the minimum requirements for the valuation interest rate for single premium immediate annuity contracts, and other similar contracts, issued after Dec. 31, 2017, including those fixed payout annuities emanating from host contracts issued on or after Jan. 1, 2017, and on or before Dec. 31, 2017. The maximum valuation interest rate requirements for those contracts and fixed payout annuities are defined in VM-V Section 13.14 of VM-22, Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves.
- D. Minimum reserve requirements for non-variable fixed annuity contracts issued on 1/1/2024 and later are those requirements as found in Sections 1 through 12.13 of VM-22, with the exception of Guaranteed Investment Contracts, Synthetic Guaranteed Investment Contracts, and other stable value contracts which shall follow the requirements found in VM-A and VM-C.

The requirements in this section are still considered a part of PBR requirements and therefore are applicable to VM-G.

The below principles may serve as key considerations for assessing whether VM 21 or VM 22 requirements apply:

- D. Minimum reserve requirements apply:
  - E. Upon determining whether annuities fall under the requirements in paragraphs B, C, and D in this subsection, the below principles shall be followed: Index for index linked or modified guaranteed annuity contracts or riders that satisfy both of the following conditions may be a key consideration for application of VM 22 requirements: and are issued on 1/1/2024 and later are those requirements: as found in Sections 1 through 13 of VM 22.:
    1. Contracts that do not Guarantees the principal amount of purchase payments, net of any partial withdrawals, and interest credited thereto, less any deduction (without regard to its timing) for sales, administrative or other expenses or charges are generally expected to follow the requirements in Paragraph B of this subsection.
    2. b. Contracts that do not Credits a rate of interest under the contract prior to the application of any market value adjustments that is at least equal to the minimum rate required to be credited by the standard nonforfeiture law in the jurisdiction in which the contract is issued are generally expected to follow the requirements in Paragraph B of this subsection.
    3. Contracts falling under the definition of Index-Linked Variable Annuities provided in VM-01 are generally expected to follow the requirements in Paragraph B of this subsection.

Commented [X5]: We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

Commented [VM226R5]: Waylon Peoples comment letter: Extend small company exemption in place for life PBR (VM-20) to VM-22.

Commented [VM227R5]: The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

Commented [CD8]: "non-variable annuity"?

Commented [VM229R8]: Edits to address this comment will be reflected in next exposure

Commented [X10]: "Section 13 of VM-22" may need to be updated if it is decided to have separate chapters for VM-22 VIR and VM-22 PBR.

Commented [VM2211R10]: Edits to address this comment will be reflected in next exposure

Commented [CD12]: "non-variable annuity"?

Commented [VM2213R12]: Edits to address this comment will be reflected in next exposure

Commented [CD14]: Consider adding the sentence: "The minimum reserve requirements of VM-22 are considered PBR requirements for purposes of the Valuation Manual." This is so VM-G will apply to VM-22, which would be appropriate.

Commented [VM2215R14]: Edits to address this comment will be reflected in next exposure

Commented [X16]: "Index-linked" annuity is not defined -- only RILA and FIA in VM-22, recommend to revise the language or add a definition to define "index linked".

Commented [VM2217R16]: ILVA is now defined instead of RILA in VM-01

Commented [VM2218]: Discuss "are generally expected to follow" vs. "shall follow"

2.4. All annuity contracts that do not fall under E.1, E.2, or E.3 in this subsection are generally expected to follow the requirements in Paragraph C or D of this subsection, in accordance with the date on which the contract has been issued.

**Guidance Note:** Paragraph E.1.b is intended to apply prior to the application of any market value adjustments for modified guaranteed annuities where the underlying assets are held in a separate account. If meeting Paragraph E.1.b prior to the application of any market value adjustments and Paragraph E.1.a above, it may be appropriate to value such contracts under VM 22 requirements.

Minimum reserve requirements-

for index

~~F. 2. Index linked or modified guaranteed annuity contracts or riders that do not satisfy either of the two conditions listed above criteria in Paragraph Section 2.E.1.i and Section 2.E.2 above and E.1.ii may be a key consideration for application of VM 21 are issued on 1/1/2024 and later are those requirements as found in VM 21.~~

**Commented [X19]:** Recommend adding this part to E.1.b and delete the Guidance Note.

**Commented [VM2220R19]:** Edits to address this comment will be reflected in next exposure

**Commented [X21]:** VM-21 specifically says "These requirements do not apply to contracts falling under the scope of VM-A-255: Modified Guaranteed Annuities; however, they do apply to contracts listed above that include one or more subaccounts containing features similar in nature to those contained in modified guaranteed annuities (MGAs) (e.g., market value adjustments)." Is this a contradiction?

**Commented [VM2222R21]:** New wording removes reference to "modified guaranteed annuity contracts"

**Commented [X23]:** Consistent with E above.

**Commented [VM2224R23]:** Edits to address this comment will be reflected in next exposure

Subsection 6: Riders and Supplemental Benefits

**Guidance Note:** ~~Policies~~ ~~Designs~~ of policies or contracts with riders and supplemental benefits which are created to simply disguise benefits subject to the Valuation Manual section describing the reserve methodology for the base product to which they are attached, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs with similar riders.

- A. If a rider or supplemental benefit is attached to a health insurance product, deposit-type contract, or credit life or disability product, it may be valued with the base contract unless it is required to be separated by regulation or other requirements.
- B. For supplemental benefits on life insurance policies or annuity contracts, including Guaranteed Insurability, Accidental Death or Disability Benefits, Convertibility, ~~Nursing Home Benefits~~ or Disability Waiver of Premium Benefits, the supplemental benefit may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, ~~VM-22~~, VM-A, and/or VM-C, as applicable.

~~C. ULSG and other secondary guarantee riders on a life insurance policy shall be valued with the base policy and follow the reserve requirements for ULSG policies under VM-20, VM-A and/or VM-C, as applicable.~~

~~D-C. Any~~ ~~any~~ guaranteed minimum benefits on life insurance policies or annuity contracts ~~not subject to Paragraph C above~~ including, but not limited to, Guaranteed Minimum Accumulation Benefits, Guaranteed Minimum Death Benefits, Guaranteed Minimum Income Benefits, Guaranteed Minimum Withdrawal Benefits, Guaranteed Lifetime Income Benefits, Guaranteed Lifetime Withdrawal Benefits, Guaranteed Payout Annuity Floors, Waiver of Surrender Charges, Return of Premium, Systematic Withdrawal Benefits under Required Minimum Distributions, and all similar guaranteed benefits shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

~~E-D.~~ If a rider or supplemental benefit to a life insurance policy or annuity contract that is not addressed in Paragraphs B, C, or D above possesses any of the following attributes, the rider or supplemental benefit shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

1. The rider or supplemental benefit does not have a separately identified premium or charge.
2. After issuance, the rider or supplemental benefit premium, charge, value or benefits are determined by referencing the base policy or contract features or performance.
3. After issuance, the base policy or contract value or benefits are determined by referencing the rider or supplemental benefit features or performance. The deduction of rider or benefit premium or charge from the contract value is not sufficient for a determination by reference.

~~F-E.~~ If a term life insurance rider on the named insured[s] on the base life insurance policy does not meet the conditions of Paragraph E above, and either (1) guarantees level or near level premiums until a specified duration followed by a material premium increase; or (2) for a rider for which level or near level premiums are expected for a period followed by a material premium increase, the rider is separated from the base policy and follows the reserve requirements for term policies under VM20, VM-A and/or VM-C, as applicable.

Commented [X25]: Still need the word "designs" otherwise this is saying the whole policy/contract was only created to disguise benefits, which would never be true.

Commented [VM2226R25]: Edits to address this comment will be reflected in next exposure

Commented [X27]: This reference is another place where there would be a benefit distinguishing the PBR sections of VM-22 from the non-PBR sections.

Commented [VM2228R27]: Edits to address this comment will be reflected in next exposure

Commented [X29]: These parallel requirements can be combined.

Commented [VM2230R29]: Edits to address this comment will be reflected in next exposure



~~G.F.~~ For all other riders or supplemental benefits on life insurance policies or annuity contracts not addressed in Paragraphs B through F above, the riders or supplemental benefits may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A and/or VM-C, as applicable. For a given rider, the election to include riders or supplemental benefits with the base policy or contract shall be determined at the policy form level, not on a policy-by-policy basis, and shall be treated consistently from year-to-year, unless otherwise approved by the domiciliary commissioner.

~~H.G.~~ Any supplemental benefits and riders offered on life insurance policies or annuity contracts that would have a material impact on the reserve (for VM-20 and VM-22) or TAR (for VM-21) if elected later in the contract life, such as joint income benefits, nursing home benefits, or withdrawal provisions on annuity contracts, shall be considered when determining reserves (for VM-20 and VM-22) or reserves and TAR (for VM-21) using the following principles:

- ~~1. The company must assume that policyholders' and contract holders' efficiency will increase over time unless the company has relevant and credible experience or clear evidence to the contrary. Policyholders with living benefits and annuitization in the same contract will generally use the more valuable of the two benefits.~~
- ~~2. Unless the company has relevant and credible experience to the contrary, when advantageous, policyholders will commence living benefit payouts if not started yet.~~

**Commented [X31]:** Simplifications are judged relative to reserves for VM-20/VM-21 and TAR for VM-21.

**Commented [VM2232R31]:** Edits to address this comment will be reflected in next exposure

**Commented [X33]:** This section states that "When advantageous, policyholders will commence living benefit payouts if not started yet." This text seems to directly contradict VM-22 Section 6.H.2 which states "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally". We suggest revising 6.H.2 to align with the text of 10.D.8.

**Commented [VM2234R33]:** From 9/7 discussion, replaced language that states the company must assume that efficiency will increase over time (consistent with Section 10.D.5).

VM-01: Definitions for Terms in Requirements

- The term “Deferred Income Annuity” (DIA) means an annuity contract that guarantees a periodic payment for the life of the annuitant or a term certain and payments begin 13 months or later from the issue date if the contract holder survives to a predetermined future age.
- The term Guaranteed Investment Contract (GIC) means an accumulation-based group annuity contract issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.
- The term “Guaranteed Minimum Accumulation Benefit” (GMAB) means a guaranteed benefit providing, or resulting in the provision, that an amount payable on the contractually determined maturity date of the benefit will be increased and/or will be at least a minimum amount. Only such guarantees having the potential to produce a contractual total amount payable on benefit maturity that exceeds the account value, or in the case of an annuity providing income payments, an amount payable on benefit maturity other than continuation of any guaranteed income payments, are included in this definition.
- The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:
  - Increased by an amount that may be either specified by or computed from other policy or contract values; and
  - Contains either:
    - The potential to produce a contractual total amount payable on such death that exceeds the account value, or
    - In the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.
- The term “guaranteed minimum income benefit” (GMIB) means an option under which the contractholder has the right to apply a specified minimum amount that could be greater than the amount that would otherwise be available in the absence of such benefit to provide periodic income using a specified purchase basis.
- The term “Index Credit” means any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to contract values that is linked to an index or indices. Amounts credited to the contract resulting from a floor on an index account are included.
- The term “Index Credit Hedge Margin” means a margin capturing the risk of inefficiencies in the company’s hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions

Commented [X35]: Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

Commented [VM2236R35]: Edits to address this comment are reflected

Commented [X37]: The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

Commented [VM2238R37]: Edits to address this comment are reflected

Commented [CD39]: should be “contract”

Commented [VM2240R39]: Edits to address this comment are reflected

Commented [CD41]: should be “contract”

Commented [VM2242R41]: Edits to address this comment are reflected

- The term “Index Crediting Strategies” means strategies defined in a contract to determine index credits for a contract. For example, this may refer to underlying index, index parameters, date, timing, performance triggers, and other elements of the crediting method.
- The term “Index-Linked Variable Annuity” (ILVA) means an annuity contract with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, in addition to downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.
- The term “Longevity Reinsurance” means an agreement or reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.
  - The reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.
  - Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular, contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.
- The term “Pension Risk Transfer” (PRT) means an annuity, either a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).
- The term “Single Premium Immediate Annuity” (SPIA) means an annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months from the issue date.
- The term “Stable Value Contracts” means accumulation-based group contracts that provide limited investment guarantees, preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios may consist of fixed income securities, which may sit in the insurer’s general account, a separate account, or in a third-party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.
- The term “Structured Settlement Contracts” are defined as annuity contracts that provide periodic benefits and purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes.

**Commented [X43]:** The definition states that [redacted] Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition”. Why is this the case and does this imply that longevity swaps are not within the scope of VM-22? Recommend adding to the out of scope list in “2.A. Scope” if that is the case. Clarification would also be helpful on what guidance should be used for these agreements if out of scope for VM-22. Further, we would suggest removing “typically” from the definition.

**Commented [VM2244R43]:** Academy will follow-up with proposed revisions to the definition of Longevity Reinsurance.

**Commented [VM2245]:** New Jersey comment letter: due to future premiums, longevity reinsurance may generate negative reserves, which can be used to eliminate or reduce other immediate annuity reserves. Suggest using net premium methodology, solving for a k-factor at issue to solve for  $PV(\text{premiums}) = PV(\text{benefits})$ .

**Commented [VM2246R45]:** VM-22 Subgroup has exposed a proposal from NJ to address this issue.

**Commented [X47]:** Is “typically” intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance, it would be helpful to clarify where a longevity swap contract falls within these definitions. Notably, index-based longevity swaps should be out of scope as they do not meet definition of “annuity contract” in SSAP 50. It should also be made explicit that PRT contracts can include lump sum benefits, death benefits and cash balance benefits as well.

**Commented [VM2248R47]:** Academy will review this comment as part of revisiting the longevity reinsurance definition.

**Commented [X49]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Commented [VM2250R49]:** Edits to address this comment are reflected

**Commented [X51]:** The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Commented [VM2252R51]:** Edits to address this comment are reflected

**Commented [X53]:** Suggest striking sentence “Adverse mortality is typically expected for these contracts.” from definition. Additionally, it is possible that there may be non-standard settlements.

**Commented [VM2254R53]:** Edits to address this comment will be reflected in next exposure

- The term “Synthetic Guaranteed Investment Contract” (SGIC) means contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the contract holder or plan trust.
- The term “Term Certain Payout Annuity” means an annuity contract that offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.

Commented [CD55]: suggest spelling out GIC first, followed by the acronym

Commented [VM2256R55]: Edits to address this comment will be reflected in next exposure

Commented [CD57]: should be "contract holder"

Commented [VM2258R57]: Edits to address this comment will be reflected in next exposure

Section 1: Background

A. Purpose

~~Sections 1 through 13 of~~ These requirements establish the minimum reserve valuation standard for non-variable annuity contracts as defined in Section 2.A and issued on or after ~~1/1/2024~~. ~~Section 14 of these requirements establish the maximum valuation rate for payout annuities for contracts issued on or after 1/1/2018.~~ For all contracts encompassed by the Scope, these requirements constitute the Commissioners Annuity Reserve Valuation Method (CARVM) and, for certain contracts and certificates, the Commissioners Reserve Valuation Method (CRVM).

**Guidance Note:** CRVM requirements apply to some group pension contracts.

**Drafting Note:** There is a guidance note in VM-21 explains that the reserve projection requirements are generally consistent with RBC C-3 Phase II requirements. However, it was decided to exclude this guidance note from VM-22 for the time being, though this may be revisited depending on whether further updates are made to the C-3 Phase I capital framework.

**Guidance Note:**  
Relationship to RBC Requirements  
 These requirements anticipate that the projections described herein are used for the determination of RBC for all of the contracts falling within the scope of these requirements. These requirements and the RBC requirements for the topics covered within Sections 4.A through 4.F are identical. However, while the projections described in these requirements are performed on a basis that ignores federal income tax, a company may elect to conduct the projections for calculating the RBC requirements by including projected federal income tax in the cash flows and reducing the discount interest rates used to reflect the effect of federal income tax as described in the RBC requirements. A company that has elected to calculate RBC requirements in this manner may not switch back to using a calculation that ignores the effect of federal income tax without approval from the domiciliary commissioner.

B. Principles

The projection methodology used to calculate the ~~stochastic reserve~~SR is based on the following set of principles. These principles should be followed when interpreting and applying the methodology in these requirements and analyzing the resulting reserves.

**Guidance Note:** The principles should be considered in their entirety, and it is required that companies meet these principles with respect to those contracts that fall within the scope of these requirements and are in force as of the valuation date to which these requirements are applied.

**Principle 1:** The objective of the approach used to determine the ~~stochastic reserve~~SR is to quantify the amount of statutory reserves needed by the company to be able to meet contractual

**Commented [X59]:** The proposal suggests VM-22 is not operative until 1/1/2024, which contradicts Section 13 and existing requirements. We would suggest rewording this to clarify that Section 13 is effective after 12/31/2017. Further, we would suggest consistency in labeling of dates (either all text or all numeric).

**Commented [VM2260R59]:** Edits to address this comment will be reflected in next exposure

**Commented [CD61]:** might be clearer to refer to "Section 2.A" here

**Commented [VM2262R61]:** No objections from the Subgroup to an approach that is broader and focuses less on definitions. Modifications are included in the latest draft to remove some definitions, change the scope section to point to VM Section II, and add principles to VM Section II.

**Commented [X63]:** The statement only addresses "contracts". Recommend adding "and certificates". Need to do a holistic review if where "and certificates" may be needed.

**Commented [VM2264R63]:** Edits to address this comment will be reflected in next exposure

**Commented [X65]:** (Relationship to RBC Requirements): The VM-21 guidance note was not included in VM-22; however, we believe it would be appropriate to retain and reword to say, "products that calculate a stochastic reserve", since the relationship to RBC would likely be maintained.

**Commented [VM2266R65]:** Subgroup agreed to remove guidance note for now and replace with a drafting note that states the RBC reference will be revisited based on whether updates are made to the C-3 Phase I framework.

**Commented [X67]:** We would support consistent application of principles across all chapters as currently VM-20 does not have a like set of principles. We believe this could involve a broader discussion of the assorted product requirements in the VM. As a shorter-term fix, we would recommend generalizing the principles where appropriate and moving these to "Section 1, Introduction" or "VM-01" and equally applying to VM-20.

**Commented [VM2268R67]:** Discussed with Subgroup. Members are open and interested to a common principles chapter, but decided to hold off on developing for now.

obligations in light of the risks to which the company is exposed with an element of conservatism consistent with statutory reporting objectives.

**Principle 2:** The calculation of the ~~stochastic reserve~~SR is based on the results derived from an analysis of asset and liability cash flows produced by the application of a stochastic cash-flow model to equity return and interest rate scenarios. For each scenario, the greatest present value of accumulated deficiency is calculated. The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions and prescribed guardrails) to allow the natural offset of risks within a given scenario. The methodology uses a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model and sets the ~~stochastic reserve~~SR at a degree of confidence using the CTE measure applied to the set of scenario specific greatest present values of accumulated deficiencies that is deemed to be reasonably conservative over the span of economic cycles.

**Guidance Note:** Examples where full aggregation between contracts may not be possible include experience rated group contracts and the operation of reinsurance treaties.

**Principle 3:** The implementation of a model involves decisions about the experience assumptions and the modeling techniques to be used in measuring the risks to which the company is exposed. Generally, assumptions are to be based on the conservative end of the confidence interval. The choice of a conservative estimate for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the ~~stochastic reserve~~SR at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the ~~stochastic reserve~~SR, the company should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

**Guidance Note:** The intent of Principle 3 is to describe the conceptual framework for setting assumptions. Section 10 provides the requirements and guidance for setting contract holder behavior assumptions and includes alternatives to this framework if the company is unable to fully apply this principle. More guidance and requirements for setting assumptions in general are provided in Section 12.

**Principle 4:** While a stochastic cash-flow model attempts to include all real-world risks relevant to the objective of the stochastic cash-flow model and relationships among the risks, it will still contain limitations because it is only a model. The calculation of the ~~stochastic reserve~~SR is based on the results derived from the application of the stochastic cash-flow model to scenarios, while the actual statutory reserve needs of the company arise from the risks to which the company is (or will be) exposed in reality. Any disconnect between the model and reality should be reflected in setting prudent estimate assumptions to the extent not addressed by other means.

**Principle 5:** Neither a cash-flow scenario model ~~nor a method based on factors calibrated to the results of a cash flow scenario model~~ can completely quantify a company's exposure to risk. A model attempts to represent reality but will always remain an approximation thereto

**Commented [CD69]:** for consistency, will this edit be considered for VM-21 as well?

**Commented [VM2270R69]:** VM-22 Subgroup will initially focus on VM-22. Consistency with other VM chapters can be explored after development of initial Subgroup recommendation for VM-22.

**Commented [X71]:** We support this principle but note that later sections appear to contradict this principle. For example, the statement "The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions) to allow the natural offset of risks within a given scenario." contradicts with the introduction of additional reserve categories and other limitations (such as model segment restrictions).

**Commented [VM2272R71]:** No objections from subgroup members to include "and prescribed guardrails" in principal 2 to address the concern in this comment.

**Commented [X73]:** Principle 2: Recommend reinstating Guidance Note in Principle 2 to be consistent with VM-21.

**Commented [VM2274R73]:** No objections from Subgroup members to reinstating this guidance note.

**Commented [X75]:** We suggest deleting the sentence "Generally, assumptions are..." since it does not provide guidance. We also suggest tightening the remainder of the text for clarity.

**Commented [VM2276R75]:** Subgroup in favor of retaining language

**Commented [X77]:** ~~and general assumption guidance~~

**Commented [VM2278R77]:** Subgroup agreed with this comment. Edits to address this comment will be reflected in next exposure.

**Commented [X79]:** Principle 5 has the statement "nor a method based on factors calibrated to the results of a cash flow scenario model" which is intended for the Alternative Methodology in VM-21. The statement should be deleted from VM-22.

**Commented [VM2280R79]:** Edits to address this comment will be reflected in next exposure

and, hence, uncertainty in future experience is an important consideration when determining the stochastic reserve SR. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve solely to reduce the calculated stochastic reserve SR without also reducing risk on scenarios similar to those used in the actual cash-flow modeling are inconsistent with these principles. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit “foreknowledge” of the components of the required methodology.

**Commented [X81]:** We recommend deleting the third sentence (starting with “Therefore, the use of assumptions...”) because this lacks historical context and is covered by the final sentence.

**Commented [VM2282R81]:** Subgroup in favor of retaining language

C. Risks Reflected and Risks Not Reflected

**Commented [X83]:** Consistent with our comments in B, we would support consistent application of risks reflected across all chapters, rather than embedding the language in each chapter. Were this to be retained in VM-22, we would suggest maintaining consistency with VM-21 to avoid any confusion.

1. The risks reflected in the calculation of reserves under these requirements arise from actual or potential events or activities that are both:

**Commented [VM2284R83]:** The Subgroup is open to a common chapter with all risks identified for different PBR frameworks, but decided to hold off on developing for now.

- a. Directly related to the contracts falling under the scope of these requirements or their supporting assets; and
- b. Capable of materially affecting the reserve.

**Commented [CD85]:** VM-21 has “... and Risks Not Reflected” in this section header, which should be retained here since the section on risks not reflected is still in here.

2. Categories and examples of risks reflected in the reserve calculations include, but are not necessarily limited to:

**Commented [VM2286R85]:** Subgroup in favor of changing section header, as subsection 3 will be removed, but “risks not reflected” is still applicable to subsection 4

- a. Asset risks
  - i. Credit risks (e.g., default or rating downgrades).
  - ii. Commercial mortgage loan roll-over rates (roll-over of bullet loans).
  - iii. Uncertainty in the timing or duration of asset cash flows (e.g., shortening (prepayment risk) and lengthening (extension risk)).
  - iv. Performance of equities, real estate, and Schedule BA assets.
  - v. Call risk on callable assets.
  - vi. Separate account fund performance.

**Drafting Note:** Feedback welcome on whether to remove reference to separate accounts in VM-22. Whether references to separate accounts are retained or removed, consider making the treatment of such references consistent throughout VM-22.

**Commented [CD87]:** Can a non-variable annuity have a separate account fund? I am not aware of any such annuity, that is not a variable annuity. Furthermore, all references to separate accounts and fund performance were deleted from this draft. Thus, we should consider deleting this item from the list.

- vii. Risk associated with hedge instrument (includes basis, gap, price, parameter estimation risks, and variation in assumptions).
  - viii. Currency risk.
- b. Liability risks

**Commented [VM2288R87]:** Decided to retain for now, but add a drafting note to solicit feedback and mention the draft should be consistent throughout (as CA pointed out that the comment was regarding being internally consistent within the VM-22 draft).

- i. Reinsurer default, impairment, or rating downgrade known to have occurred before or on the valuation date.
  - ii. Mortality/longevity, persistency/lapse, partial withdrawal, and premium payment risks.
  - iii. Utilization risk associated with guaranteed living benefits.
  - iv. Anticipated mortality trends based on observed patterns of mortality improvement or deterioration, where permitted.
  - v. Annuitization risks.
  - vi. Additional premium dump-ins or deposits (high interest rate guarantees in low interest rate environments).
  - vii. Applicable expense risks, including fluctuation in maintenance expenses directly attributable to the business, future commission expenses, and expense inflation/growth.
- c. Combination risks
- i. Risks modeled in the company's risk assessment processes that are related to the contracts, as described above.
  - ii. Disintermediation risk (including such risk related to payment of surrender or partial withdrawal benefits).
  - iii. Risks associated with revenue-sharing income.
- ~~33. The risks not necessarily reflected in the calculation of reserves under these requirements are:~~
- a. ~~Those not associated with the policies or contracts being valued, or their supporting assets.~~
  - b. ~~Determined to not be capable of materially affecting the reserve.~~
34. Categories and examples of risks not reflected in the reserve calculations include, but are not necessarily limited to:
- a. Asset risks
    - i. Liquidity risks associated with a sudden and significant levels of withdrawals and surrenders. "run on the bank."
  - b. Liability risks
    - i. Reinsurer default, impairment or rating downgrade occurring after the valuation date.
    - ii. Catastrophic events (e.g., epidemics or terrorist events).

- Commented [CD89]:** Is there a distinction between "dump-ins" and "deposits"? Why are both words needed? Also, if it's determined that both words are needed, should this same change be made in VM-21?
- Commented [VM2290R89]:** Edits to address this comment will be reflected in next exposure
- Commented [X91]:** Recommend change to "fluctuation in" maintenance expenses for clarity.
- Commented [VM2292R91]:** Edits to address this comment will be reflected in next exposure
- Commented [CD93]:** should this same change also be made to VM-21?
- Commented [VM2294R93]:** Potential VM-21 will be examined separately from this Subgroup at a later point
- Commented [X95]:** We recommend removing the bullet "Risks modeled in the company's risk assessment processes that are related to the contracts, as described above" as this is unclear and probably extraneous.
- Commented [VM2296R95]:** Subgroup in favor of retaining language.
- Commented [X97]:** We recommend removing this section. With the specific RBC language removed, the section loses meaning: "a" is unnecessary and "b" is redundant with other sections of the VM which allow for materiality considerations (language in VM-20 is likely better for this purpose and should be used consistently).
- Commented [VM2298R97]:** Subgroup agrees with removing this section.
- Commented [CD99]:** Suggest eliminated "policies or", since customarily, annuities are "contracts"
- Commented [VM22100R99]:** Edits to address this comment will be reflected in next exposure
- Commented [CD101]:** This is not in VM-21, and my suggestion would be to delete this
- Commented [VM22102R101]:** Subgroup agrees with removing
- Commented [X103]:** Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are ... [1]
- Commented [VM22104R103]:** Subgroup agrees with removing this section.
- Commented [CD105]:** should this same change also be made to VM-21?
- Commented [VM22106R105]:** Edits to address this comment will be reflected in next exposure
- Commented [X107]:** The revised language "sudden and significant levels of withdrawal and surrenders" replaced ... [2]
- Commented [VM22108R107]:** Subgroup in favor of retaining VM-21 language of "run on the bank".



- iii. Major breakthroughs in life extension technology that have not yet fundamentally altered recently observed mortality experience.
  - iv. Significant future reserve increases as an unfavorable scenario is realized.
- c. General business risks
- i. Deterioration of reputation.
  - ii. Future changes in anticipated experience (reparameterization in the case of stochastic processes), which would be triggered if and when adverse modeled outcomes were to actually occur.
  - iii. Poor management performance.
  - iv. The expense risks associated with fluctuating amounts of new business.
  - v. Risks associated with future economic viability of the company.
  - vi. Moral hazards.
  - vii. Fraud and theft.
  - viii. Operational.
  - ix. Litigation.

D. Specific Definitions for VM-22

**Buffer Annuity**

Interchangeable term for Registered Index Linked Annuity (RILA). See definition for Registered Index Linked Annuity below.

E.

• **Deferred Income Annuity (DIA)**

An annuity which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin one year or later after (or from) the issue date if the contract holder survives to a predetermined future age.

• **Fixed Indexed Annuity (FIA)**

An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to a n-external index, typically with guaranteed principal.

• **Flexible Premium Deferred Annuity (FPDA)**

An annuity with an account value established with a premium amount but allows for additional deposits to be paid into the annuity over time, resulting in an increase to the account value. The contract also has a guaranteed interest rate during the accumulation phase and has

**Commented [X109]:** We recommend deleting the wording "fundamentally". If a breakthrough is known to have fundamentally changed expected future mortality, but is not yet significantly reflected in historical experience, why is it not reflected? Do we know about this fundamental shift for years before it is reflected? This issue also applies to the VM-21 requirement.

**Commented [VM22110R109]:** Edits to address this comment will be reflected in next exposure

**Commented [X111]:** We recommend removing the bullet "Significant future reserve increases as an unfavorable scenario is realized" as this is extraneous.

**Commented [VM22112R111]:** Subgroup in favor retaining language to stay consistent with VM-21.

**Commented [X113]:** List could be expanded to include operational risk and litigation risk.

**Commented [VM22114R113]:** Edits to address this comment will be reflected in next exposure

**Commented [X115]:** It seems the definitions included in this section are largely only used for the purpose of establishing the Scope in Section 2. Since this is intended to be a principles-based methodology, recommend a strong definition of "Fixed Annuity" instead of specific products underneath this business. The first paragraph in A. Scope seems to provide this with specific references which are out of scope. If changing the scope section, we would suggest deleting the various product definitions if not used elsewhere; if these definitions are potentially applied ... [3]

**Commented [VM22116R115]:** No objections from ... [4]

**Commented [CD117]:** The format of this Definition ... [5]

**Commented [VM22118R117]:** Edits to address th ... [6]

**Commented [X119]:** The term Buffer Annuity is no ... [7]

**Commented [VM22120R119]:** Edits to address th ... [8]

**Commented [VM22121]:** Moved to VM-01

**Commented [X122]:** Suggest aligning the cut off to ... [9]

**Commented [VM22123R122]:** Edits to address t ... [10]

**Commented [X124]:** The wording "after (or from) ... [12]

**Commented [VM22125R124]:** Edits to address t ... [11]

**Commented [VM22126]:** Removed, as no referen ... [13]

**Commented [X127]:** Is "typically" intended to be ... [14]

**Commented [VM22128R127]:** The definition is r ... [15]

**Commented [CD129]:** insert: "subject to certain limits,"

**Commented [VM22130R129]:** The definition is r ... [16]

**Commented [X131]:** The definition of FIA describ ... [17]

**Commented [VM22132R131]:** The definition is r ... [18]

**Commented [VM22133]:** Removed, as no referen ... [19]

guaranteed mortality and interest rates applicable at the time of conversion to the payout phase.

• **Funding Agreement**

A contract issued to an institutional investor (domestic and international non-qualified fixed income investors) that provides fixed or floating interest rate guarantees.

**Commented [VM22134]:** Removed, as no reference is currently made

• **Guaranteed Investment Contract (GIC)**

Insurance contract typically issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.

**Commented [VM22135]:** Moved to VM-01

• **Index Credit Hedge Margin**

A margin capturing the risk of inefficiencies in the company's hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions.

**Commented [VM22136]:** Moved to VM-01

**Commented [VM22137]:** Moved to VM-01

**Commented [CD138]:** should be "contract"

**Commented [VM22139R138]:** Edits to address this comment will be reflected in next exposure

**Commented [CD140]:** should be "contract"

**Commented [VM22141R140]:** Edits to address this comment will be reflected in next exposure

• **Index Credit**

Any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to policy values that is linked to an index or indices. Amounts credited to the policy resulting from a floor on an index account are included.

**Commented [VM22142]:** Moved to VM-01

**Commented [VM22143]:** Removed

**Commented [X144]:** We would suggest adding performance trigger to the list, along with other potential crediting methods; alternatively, the definition could specify that the crediting methods listed are examples only.

• **Index Crediting Strategy**

The strategy defined in a contract to determine index credits for a contract. This refers to underlying index, index parameters, date, timing, and other elements of the crediting method.

**Commented [VM22145R144]:** The definition is removed in the latest draft

**Commented [VM22146]:** Moved to VM-01

• **Index Parameter**

Cap, floor, participation rate, spreads, or other features describing how the contract utilizes the index.

**Commented [X147]:** The definition states that "Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61 are not included in this definition". Why is this the case and does this imply that longevity swaps are not within the scope of VM-22? Recommend adding to the out of scope list in "2.A. Scope" if that is the case. Clarification would also be helpful on what guidance should be used for these agreements if out of scope for VM-22. Further, we would suggest removing "typically" from the definition.

• **Longevity Reinsurance**

An agreement, typically a reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.

**Commented [VM22148R147]:** Academy will follow-up with proposed revisions to the definition of Longevity Reinsurance.

Typically, the reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these

**Commented [VM22149]:** New Jersey comment letter due to future premiums, longevity reinsurance may generate negative reserves, which can be used to eliminate or reduce other immediate annuity reserves. Suggest using net premium methodology, solving for a factor at issue to solve for  $PV(\text{premiums}) = PV(\text{benefits})$ .

**Commented [VM22150R149]:** VM-22 Subgroup has exposed a proposal from NJ to address this issue.

agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.

- Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular, contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index based longevity swaps) are not included in this definition.

• **Market Value Adjustment (MVA) Annuity**

An annuity with an account value where withdrawals and full surrenders are subject to adjustments based on interest rates or index returns at the time of withdrawal/surrender. There could be ceilings and floors on the amount of the market value adjustment.

• **Modified Guaranteed Annuity (MGA)**

A type of market-value adjusted annuity contract where the underlying assets are held in an insurance company separate account and the value of which are guaranteed if held for specified periods of time. The contract contains nonforfeiture values and death benefits that are based upon a market value adjustment formula if held for shorter periods.

• **Multiple Year Guaranteed Annuity (MYGA)**

A type of fixed annuity that provides a pre-determined and contractually guaranteed interest rate for specified periods of time, after which there is typically an annual reset or renewal of a multiple year guarantee period.

• **Pension Risk Transfer (PRT) Annuity**

An annuity, typically a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).

• **Registered Index Linked Annuity (RILA)**

An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to a n external index, similar to a Fixed Indexed Annuity, but with downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.

• **Single Premium Immediate Annuity (SPIA)**

An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within one year after (or from) the issuedate/issue date.

**Commented [VM22151]:** Removed, as no reference is currently made

**Commented [VM22152]:** Removed, as no reference is currently made

**Commented [X153]:** We recommend editing the definition as follows "A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account..."

**Commented [VM22154R153]:** The definition is removed in the latest draft

**Commented [X155]:** To clarify definition of MGA, recommend adding "death benefits"

**Commented [VM22156R155]:** The definition is removed in the latest draft

**Commented [VM22157]:** Removed, as no reference is currently made

**Commented [CD158]:** should this be "Multi-Year" instead of "Multiple Year"? The former is the more commonly used term for MYGA

**Commented [VM22159R158]:** The definition is removed in the latest draft

**Commented [CD160]:** "fixed annuity" is not defined. Is it better to change all instances of "fixed annuity" to "non-variable annuity" to be consistent with the terminology introduced in Section 1.A (and to be aligned with the actual VM-22 chapter name)? An alternative could be to add a definition for "fixed annuity", with the definition of it being a "non-variable annuity"

**Commented [VM22161R160]:** Subgroup in favor of the term "non-variable annuity" instead of "fixed annuity". Changes are made consistently throughout the VM-22 draft.

**Commented [CD162]:** ok to keep this as "multiple year"

**Commented [VM22163R162]:** The definition is r ... [20]

**Commented [VM22164]:** Moved to VM-01

**Commented [X165]:** Is "typically" intended to be ... [21]

**Commented [VM22166R165]:** Academy will revi ... [22]

**Commented [VM22167]:** Moved to VM-01 and ... [23]

**Commented [X168]:** It is unclear to us why RILA is ... [26]

**Commented [VM22169R168]:** ACLI already follo ... [27]

**Commented [X170]:** If need to address Buffer An ... [25]

**Commented [VM22171R170]:** Edits to remove " ... [24]

**Commented [VM22172]:** Moved to VM-01

**Commented [X173]:** Suggest aligning the cut off t ... [28]

**Commented [VM22174R173]:** Edits to address t ... [29]

**Commented [X175]:** The wording "after (or from) ... [31]

**Commented [VM22176R175]:** Edits to address t ... [30]

• ~~Single Premium Deferred Annuity (SPDA)~~

~~An annuity with an account value established with a single premium amount that grows with a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase. May also include cases where the premium is accepted for a limited amount of time early in the contract life, such as only in the first duration.~~

**Commented [VM22177]:** Removed, as no reference is currently made

• ~~Stable Value Contract~~

~~A contract that provides limited investment guarantees, typically preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios typically consist of fixed income securities, which may sit in the insurer's general account, a separate account, or in a third party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.~~

**Commented [VM22178]:** Moved to VM-01

• ~~Structured Settlement Contract (SSC)~~

~~A contract that provides periodic benefits and is purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes. Adverse mortality is typically expected for these contracts.~~

**Commented [VM22179]:** Moved to VM-01

**Commented [X180]:** Suggest striking sentence "Adverse mortality is typically expected for these contracts." from definition. Additionally, it is possible that there may be non-substandard settlements.

• ~~Synthetic GIC~~

~~Contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the policyholder or plan trust.~~

**Commented [VM22181R180]:** Edits to address this comment will be reflected in next exposure

**Commented [VM22182]:** Moved to VM-01

**Commented [CD183]:** suggest spelling out GIC first, followed by the acronym

**Commented [VM22184R183]:** Edits to address this comment will be reflected in next exposure

• ~~Term Certain Payout Annuity~~

~~A contract issued, which offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.~~

**Commented [CD185]:** should be "contract holder"

**Commented [VM22186R185]:** Edits to address this comment will be reflected in next exposure

• ~~Two-Tiered Annuity~~

~~A deferred annuity with two tiers of account values. One, with a higher accumulation interest rate, is only available for annuitization or death. The other typically contains a lower accumulation interest rate, and is only available upon surrender.~~

**Commented [VM22187]:** Removed, as no reference is currently made

**Commented [VM22188]:** Removed, as no reference is currently made

~~The term "cash surrender value" means, for the purposes of these requirements, the amount available to the contract holder upon surrender of the contract. Generally, it is equal to the account value less any applicable surrender charges, where the surrender charge reflects the availability of any free partial surrender options. However, for contracts where all or a portion of the amount available to the contract holder upon surrender is subject to a market value adjustment, the cash surrender value shall reflect the market value adjustment consistent with the required treatment of the underlying assets. That is, the cash surrender value shall reflect any market value adjustments where the underlying assets are reported at market value, but it shall not reflect any market value adjustments where the underlying assets are reported at book value.~~

**Commented [CD189]:** this definition still applies, should we keep it?

**Commented [VM22190R189]:** Comment retracted in light of "Cash Surrender Value" definition being included in VM-01

~~The term "guaranteed minimum death benefit" (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:~~

- ~~— is increased by an amount that may be either specified by or computed from other policy or contract values; and~~
- ~~— has the potential to produce a contractual total amount payable on such death that exceeds the account value; or~~
- ~~— in the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.~~

E.D. Materiality

The company shall establish a standard containing the criteria for determining whether an assumption, risk factor, or other element of the principle-based valuation has a material impact on the size of the reserve. This standard shall be applied when identifying material risks.

Section 2: Scope and Effective Date

A. Scope

Non-variable annuity contracts specified in VM Section II, Subsection 2 "Annuity Contracts", Paragraph D are subject to VM-22 requirements. Subject to the requirements of this Sections 1 to 13 of VM-22 are annuity contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only, directly written or assumed through reinsurance issued on or after 1/1/2024, with the exception of contracts or benefits listed below.

Products out of scope include:

1. ~~Contracts or benefits that are subject to VM 21 (such as variable annuities, RILAs, buffer annuities, and structured annuities)~~
2. ~~GICs~~
3. ~~Synthetic GICs~~
4. ~~Stable Value Contracts~~
5. ~~Funding Agreements~~

Products in scope of VM-22 include fixed annuities which consist of, but are not limited to, the following list:

- \* ~~Account Value Based Annuities~~
  1. ~~Deferred Annuities (SPDA & FPDA)~~
  2. ~~Multi-Year Guarantee Annuities (MYGA)~~
  3. ~~Fixed Indexed Annuities (FIA)~~
  4. ~~Market Value Adjustments (MVA)~~
  5. ~~Two-tiered Annuities~~
  6. ~~Guarantees/Benefits/Riders on Fixed Annuity Contracts~~

- Commented [CD191]: this definition still applies, should we keep it?
- Commented [VM22192R191]: Subgroup recommends moving this definition to VM-01, which is now included at the end of the draft document.
- Commented [X193]: Add consistent with VM-21 Section 1.E, which was added to the 2022 VM.
- Commented [VM22194R193]: Edits to address this comment will be reflected in next exposure
- Commented [X195]: Consistent with our comment in Section 1, the language around effective date should be clear this only applies to new PBR methodology, and rates in Section 13 have a different effective date.
- Commented [VM22196R195]: Edits to address t... [32]
- Commented [X197]: We would support reworking... [37]
- Commented [VM22198R197]: No objections fro... [38]
- Commented [X199]: The reserving categories for... [36]
- Commented [VM22200R199]: See NY comment... [35]
- Commented [VM22201R199]: See Equitable.com... [34]
- Commented [VM22202R199]: The VM-22 Subgr... [33]
- Commented [CD203]: suggest numbering the par... [40]
- Commented [VM22204R203]: Edits to address t... [39]
- Commented [CD205]: suggest swapping the orde... [41]
- Commented [VM22206R205]: Edits to address t... [42]
- Commented [X207]: Since buffer annuities are a s... [43]
- Commented [VM22208R207]: Edits to address t... [44]
- Commented [CD209]: this is not defined in the D... [45]
- Commented [VM22210R209]: Edits to address t... [46]
- Commented [X211]: This needs to be revised to b... [47]
- Commented [VM22212R211]: Edits to address t... [48]
- Commented [CD213]: should this be "non-variabl... [49]
- Commented [VM22214R213]: Edits to address t... [50]
- Commented [X215]: Typo. Delete extra "the".
- Commented [VM22216R215]: Edits to address t... [52]
- Commented [CD217]: grammar - delete "the"
- Commented [VM22218R217]: Edits to address t... [51]
- Commented [CD219]: should have space instead of dash
- Commented [VM22220R219]: Edits to address t... [53]
- Commented [CD221]: delete the "s" and add "Annuities"
- Commented [VM22222R221]: Edits to address t... [54]
- Commented [CD223]: should this be "Non-Variab... [55]
- Commented [VM22224R223]: Edits to address t... [56]

~~• Payout Annuities~~

- ~~1. Single Premium Immediate Annuities (SPIA)~~
- ~~2. Deferred Income Annuities (DIA)~~
- ~~3. Term Certain Payout Annuity~~
- ~~4. Pension Risk Transfer Annuities (PRT)~~
- ~~5. Structured Settlement Contracts (SSC)~~
- ~~6. Longevity Reinsurance~~

~~The company may elect to exclude one or more groups of contracts from the stochastic reserve<sup>SR</sup> calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22.~~

B. ~~Effective Date & Transition~~

~~Effective Date~~

~~These requirements apply for valuation dates on or after January 1, 2024~~2025~~.~~

~~Transition~~

~~A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-22 PBR requirements and issued during the first three years following the effective date of VM-22 PBR. If a company during the three-year ~~years~~ transition period elects to apply VM-22 PBR to a block of such business, then a company must continue to apply the requirements of VM-22 PBR for future issues of this business. Irrespective of the transition date, a company shall apply VM-22 PBR requirements to applicable blocks of business on a prospective basis starting at least three years after the effective date.~~

Commented [CD225]: for consistency, make plural; i.e., change to "ies"

Commented [VM22226R225]: Edits to address this comment will be reflected in next exposure

Commented [X227]: We suggest moving or deleting the sentence "The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22." from this section as it does not seem fitting here.

Commented [VM22228R227]: Edits to address this comment will be reflected in next exposure

Commented [CD229]: self-referencing "VM-22" is not necessary

Commented [VM22230R229]: Edits to address this comment will be reflected in next exposure

Commented [X231]: Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here ... [57]

Commented [VM22232R231]: Edits to address this comment will be reflected in next exposure

Commented [CD233]: again, suggest numbering the paragraphs within this section

Commented [VM22234R233]: Edits to address this comment will be reflected in next exposure

Commented [X235]: We still have a question about whether RBC factors are still at an appropriate level, ... [58]

Commented [VM22236R235]: Comment related to RBC

Commented [X237]: Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section ... [59]

Commented [VM22238R237]: Subgroup discussed moving current VM-22 requirements to "VM-V".

Commented [X239]: To be more clear, recommend adding "transition period" to "the three years".

Commented [VM22240R239]: Edits to address this comment will be reflected in next exposure

Commented [X241]: Can a company wait until the end of the transition period to start PBR, but then apply PBR ... [60]

Commented [VM22242R241]: Discussed with Subgroup and decided to keep the VM-22 language silent on the ... [63]

Commented [CD243]: Will we (or should we) allow for any early adopters (like we did for VM-21)? It would ... [62]

Commented [VM22244R243]: Discussed with Subgroup and decided to not have early adoption before the st ... [61]

Section 3: Reserve Methodology

A. Aggregate Reserve

The aggregate reserve for contracts falling within the scope of these requirements shall equal the ~~stochastic reserve~~SR (following the requirements of Section 4) ~~plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option,~~ less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A and VM-C.

**Guidance Note:** Contracts valued under applicable requirements in VM-A and VM-C are ones that pass the exclusion test and elect to not model PBR ~~stochastic reserves~~SRs, per the requirements in Section 3.E.

B. Impact of Reinsurance ~~Ceded~~

All components in the aggregate reserve shall be determined post-reinsurance ceded, that is net of any reinsurance cash flows arising from treaties that meet the statutory requirements that allow the treaty to be accounted for as reinsurance. A pre-reinsurance ceded reserve also needs to be determined by ignoring all reinsurance cash flows (costs and benefits) in the reserve calculation.

~~C. To Be Determined~~The Additional Standard Projection Amount

D. The Stochastic Reserve

~~The stochastic reserve~~  
 The additional standard projection amount is determined by applying one of the two standard projection methods defined in Section 6. The same method must be used for all contracts within a group of contracts that are aggregated together to determine the reserve. The company shall elect which method they will use to determine the additional standard projection amount. The company may not change that election for a future valuation without the approval of the domiciliary commissioner.

D. The SR

1. The SR shall be determined based on asset and liability projections for the contracts falling within the scope of these requirements, excluding those contracts valued using the methodology pursuant to applicable requirements in VM-A and VM-C, over a broad range of stochastically generated projection scenarios described in Section 8 and using prudent estimate assumptions as required in Section 3.GF herein.
2. ~~The stochastic reserve~~SR amount for any group of contracts shall be determined as CTE70 of the scenario reserves following the requirements of Section 4.

E. The DR

~~, with the exception of~~The DR for groups of contracts for which a company elects the Deterministic Certification Option in Section 7.E, ~~which shall be determined as the scenario reserve~~DR following the requirements of Section 4.

Commented [X245]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22246R245]: To address SPA later in the VM-22 development process.

Commented [X247]: One of the most confused parts of the draft was referring to a DR as the SR for certain contracts. Need to handle and refer to separately.

Commented [VM22248R247]: Edits to address this comment will be reflected in next exposure

Commented [X249]: Guidance is needed on how a pre-reinsurance reserve is to be determined.

Commented [VM22250R249]: ACLI will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure

Commented [X251]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22252R251]: Edits to address this comment will be reflected in next exposure

Commented [CD253]: Should this be Section 3.G?

Commented [VM22254R253]: Edits to address this comment will be reflected in next exposure

Commented [X255]: Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

Commented [VM22256R255]: Will replace "scenario reserve" with "deterministic reserve".

3. The reserve may be determined in aggregate across various groups of contracts within each Reserving Category as a single model segment when determining the stochastic reserve if the business and risks are not managed separately or are part of the same integrated risk management program. Aggregation is permitted if a resulting group of contracts (or model segment) follows the listed principles:SR.

#### F. Aggregation of Contracts for the DR and SR

Groups of contracts within different Reserving Categories may not be aggregated together in determining the SR or DR. For the purposes of VM-22, Reserving Categories are classified as the following:

- a. The “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities:
  - i. Single premium immediate annuity contracts;
  - ii. Deferred income annuity contracts;
  - iii. Structured settlements in payout or deferred status;
  - iv. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
  - v. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
  - vi. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;
  - vii. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
  - viii. Pension Risk Transfer Annuities; and
  - ix. Longevity Reinsurance.

**Drafting Note:** Additional feedback is welcome for whether to permit optionality for categorizing guaranteed living benefit contracts with depleted fund value as either in the payout or accumulation reserving category.

**Commented [VM22257]:** include in deferred annuity with depleted fund value in payout reserving category or accumulation reserving category.

**Commented [VM22258R257]:** The Subgroup has elected to leave these contracts in the payout annuity reserving category, but is adding to a drafting note to welcome feedback.



b. The “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category”.

~~Using prudent actuarial judgement, consider the following elements when aggregating groups of contracts: whether groups of contracts are part of the same portfolio (or different portfolios that interact), same integrated risk management system, administered/managed together~~

4. Do not aggregate groups of contracts for which the company elects to use the Deterministic Certification Option in Section 7.E with any groups of contracts that do not use such option.

54. To the extent that these limits on the aggregation result results in more than one model segment, the stochastic reserve SR aggregate reserve shall equal the sum of the stochastic reserve SR amounts computed for each model segment and scenario reserve DR amounts computed for each model segment for which the company elects to use the Deterministic Certification Option in Section 7.E.

G. Stochastic Exclusion Test

1. To the extent that certain groups of contracts pass one of the defined the stochastic exclusion tests in Section 7.B, these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, and VM-C, and VM-Y with the statutory maximum valuation rate for immediate annuities specified in and Section 13.

a. ~~Guidance Note:~~ The intention of contracts that pass the stochastic exclusion test is to provide the option to value contracts under VM-A and VM-C. This may apply to pre-PBR CARVM requirements in accordance with Actuarial Guideline XXXIII (AG33) methodology with type A, B, C rates for SPIAs issued before 2018; AG33 methodology with pre-PBR VM 22 rates for SPIAs issued on/after 2018; Actuarial Guideline XXXV (AG35) pre-PBR methodology for Fixed Indexed Annuities; and AG33 methodology (with interest rate updates for modernization initiatives on new contracts) for non-SPIAs.

2. For dividend-paying contracts, a dividend liability shall be established following requirements in VM-A and VM-C, as described above, for the base contract.

2.3. The approach for grouping contracts company may not group together contract types with significantly different risk profiles when performing the exclusion tests should follow the same principles that underlie the aggregation approach for model segments discussed for Stochastic Reserves in Section D above test.

H. Allocation of the Aggregate Reserve to Contracts

The aggregate reserve shall be allocated to the contracts falling within the scope of these requirements using the method outlined in Section 4.13, with the exception of contract following Section 3.E which are to be calculated on a seriatim basis.

I. Prudent Estimate Assumptions

1. With respect to the Stochastic Reserve SR in Section 3.D, the company shall establish the prudent estimate assumption for each risk factor in compliance with the requirements

Commented [X259]: The term "Deterministic Certification Option" may be confusing, as there is no "deterministic" reserve, unlike VM-20. We recommend consideration of an alternative term. In addition, we recommend changing the phrasing to "with the exception of groups of contracts for which a company elects the [Deterministic Certification Option], following the requirements of Section 7.E."

Commented [VM22260R259]: Now that deterministic reserve exists, the ACLI is fine retaining "Deterministic Certification Option"

Commented [X261]: Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

Commented [VM22262R261]: Will replace "scenario reserve" with "deterministic reserve".

Commented [CD263]: suggest expanding header ... [64]

Commented [VM22264R263]: No objections from ... [65]

Commented [X265]: Seems to imply that only SPI ... [66]

Commented [VM22266R265]: Edits to address t ... [67]

Commented [CD267]: Suggest rewording to just s ... [68]

Commented [VM22268R267]: Edits to address t ... [69]

Commented [X269]: We believe this guidance not ... [70]

Commented [VM22270R269]: No objections to ... [71]

Commented [X271]: The statement in this sectio ... [72]

Commented [VM22272R271]: Subgroup agreed ... [73]

Commented [X273]: This section seems to indic ... [74]

Commented [VM22274R273]: Subgroup voted t ... [75]

Commented [CD275]: for clarity, change this refe ... [76]

Commented [VM22276R275]: Edits to address t ... [77]

Commented [CD277]: again, suggest rewording t ... [78]

Commented [VM22278R277]: Edits to address t ... [79]

Commented [X279]: Based on VM-20 language.

Commented [VM22280R279]: Subgroup agreed ... [80]

Commented [X281]: Either in this item or in Secti ... [81]

Commented [VM22282R281]: Edits to address t ... [82]

Commented [X283]: This sub-section seems more ... [83]

Commented [VM22284R283]: The Subgroup dec ... [84]

Commented [CD285]: VM-21 Section 3.H on ... [85]

Commented [VM22286R285]: Subgroup decided ... [86]

Commented [CD287]: should this be "Section 3.D"?

Commented [VM22288R287]: Edits to address t ... [87]

in Section 12 of Model #820 and must periodically ~~at least every 3 years~~ review and update the assumptions as appropriate in accordance with these requirements.

**Drafting Note:** Consider replacing “periodically” with “at least every 3 years in the paragraph above upon adoption of a similar APF for VM-20/VM-21.”

1.2. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. ~~If the results of statistical testing or other testing the review indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary (Company) shall set a new, adequate, anticipated experience assumption for the factor.~~

2.3. To determine the prudent estimate assumptions, the ~~stochastic reserve~~ SR shall also follow the requirements in Sections 4 and ~~general assumptions including Section 9~~ for asset assumptions, Section 10 for ~~contract policy holder~~ behavior assumptions, and Section 11 for mortality assumptions, and Section 12 for general guidance and expense assumptions.

J. Approximations, Simplifications, and Modeling Efficiency Techniques

A company may use simplifications, approximations, and modeling efficiency techniques to calculate the SR and/or the additional standard projection amount required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations, and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

**Guidance Note:**

Examples of modeling efficiency techniques include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques or other similar simplifications.

There are multiple ways of providing the demonstration required by Section 3.H. The complexity of the demonstration depends upon the simplifications, approximations or modeling efficiency techniques used. Examples include, but are not limited to:

1. Rounding at a transactional level in a direction that is clearly and consistently conservative or is clearly and consistently unbiased with an obviously immaterial impact on the result (e.g., rounding to the nearest dollar) would satisfy 3.H without needing a demonstration. However, rounding to too few significant digits relative to the quantity being rounded, even in an unbiased way, may be material and in that event, the company may need to provide a demonstration that the rounding would not produce a material understatement of the reserve.

**Commented [X289]:** Recommend to periodically review at least every three years.

**Commented [VM22290R289]:** Subgroup decided to adopt this wording if a similar APF is adopted for VM-20/VM-21.

**Commented [CD291]:** Should this be “the company... shall”, rather than the “qualified actuary... shall”? Not sure why this particular task falls on the QA, when “the company” generally has responsibility for PBR and, in the subsection directly before this one, the company is assigned the task of establishing prudent estimate assumptions.

**Commented [VM22292R291]:** Edits to address this comment will be reflected in next exposure

**Commented [X293]:** Suggest replacing “If the results of statistical testing or other testing” with “If the results of the review” to simplify language and avoid possible confusion.

**Commented [VM22294R293]:** Edits to address this comment will be reflected in next exposure

**Commented [X295]:** Recommend replacing “the qualified actuary” with “the Company” consistent with general PBR requirements that the company set assumptions.

**Commented [VM22296R295]:** Edits to address this comment will be reflected in next exposure

**Commented [CD297]:** should this be “the company”? See prior comment.

**Commented [VM22298R297]:** Edits to address this comment will be reflected in next exposure

**Commented [CD299]:** should this be “contract holder”?

**Commented [VM22300R299]:** Edits to address this comment will be reflected in next exposure

**Commented [X301]:** Need a new section for the general assumptions, including specifics for the expense assumptions. APF currently exposed for VM-21. We should be consistent with any edits.

**Commented [VM22302R301]:** Edits to address this comment will be reflected in next exposure

2. A brute force demonstration involves calculating the minimum reserve both with and without the simplification, approximation or modeling efficiency technique, and making a direct comparison between the resulting reserve. Regardless of the specific simplification, approximation or modeling efficiency technique used, brute force demonstrations always satisfy the requirements of Section 3.H.

3. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters and providing a detailed demonstration of why it did not understate the reserve by a material amount and the expected value of the reserve would not be less than the expected value of the reserve that would otherwise be calculated. This demonstration may be a theoretical, statistical or mathematical argument establishing, to the satisfaction of the insurance commissioner, general bounds on the potential deviation in the reserve estimate rather than a brute force demonstration.

~~Justify the use of randomly sampling withdrawal ages for each contract instead of following the exact prescribed WDCM method by demonstrating that the random sampling method is materially equivalent to the exact prescribed approach, and the simplification does not materially reduce the Additional Standard Projection Amount and the final reported reserve. In particular, the company should demonstrate that the statistical variability of the results based on the random sampling approach is immaterial by testing different random sets, e.g., if randomly selecting a withdrawal age for each contract, the probability distribution of the withdrawal age should be stable and not vary significantly when using different random number sets.~~

**Drafting Note:** Add back in the WDCM method example in the above guidance note if VM-22 uses this method for the SPA calculation.

**Commented [X303]:** Specific example should be tailored based on the SPA developed.

**Commented [VM22304R303]:** Delete for now and add back in if the WDCM method is used for the VM-22 SPA calculation.

**Commented [X305]:** Added consistent with VM-21 Section 3.H, which was added to the 2022 VM.

**Commented [VM22306R305]:** Edits to address this comment will be reflected in next exposure

Section 4: Determination of ~~Stochastic Reserve~~ SR

A. Projection of Accumulated Deficiencies

1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9.D. The company shall project cash flows including the following:

a. ~~Revenues~~ Gross premium received by the company including gross premiums received from the ~~policyholder, policyholder,~~ contract holder (including any due premiums as of the projected start date).

**Guidance Note:** If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.

b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses).

All material benefits projected to be paid to ~~contract~~ policyholders including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

**Guidance Note:** Amounts charged to account values on general account business are not revenue; examples include rider charges and expense charges.

a.c. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.

b.d. Insurance company expenses (including overhead and investment maintenance expense), commissions, contractual fees and charges, and revenue sharing income received by the company (net of applicable expenses) other acquisition expenses associated with business in force as of the valuation date.

e.e. Net Cash flows associated with any reinsurance.

d.f. Cash flows from hedging instruments as described in Section 4.A.4.

**Commented [NJ307]:** Consider including stochastic mortality in the SR for longevity reinsurance

**Commented [VM22308R307]:** Ported over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk for reinsurance liability assumptions. New language is included in Section 5.A.2.e, including a guidance note that explicitly mentions longevity reinsurance.

**Commented [CD309]:** Should this refer to Section 4 and Section 9?

**Commented [VM22310R309]:** Edits to address this comment will be reflected in next exposure

**Commented [CD311]:** "contract holder"?

**Commented [VM22312R311]:** Edits to address this comment will be reflected in next exposure

**Commented [X313]:** If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below. ... [88]

**Commented [VM22314R313]:** Edits to address this comment will be reflected in next exposure

**Commented [CD315]:** "contract holders"

**Commented [VM22316R315]:** Edits to address this comment will be reflected in next exposure

**Commented [X317]:** The purpose of this guidance note is not clear as these charges would be reflected in the ... [89]

**Commented [VM22318R317]:** Edits to address this comment will be reflected in next exposure

**Commented [CD319]:** should this be Section 10.I?

**Commented [VM22320R319]:** Edits to address this comment will be reflected in next exposure

**Commented [X321]:** Changed investment expense to be maintenance expense so that it does not repeat what ... [90]

**Commented [VM22322R321]:** Edits to address this comment will be reflected in next exposure

**Commented [X323]:** Added acquisition expenses.

**Commented [VM22324R323]:** Edits to address this comment will be reflected in next exposure

**Commented [X325]:** Take out the revenues that covers the investment expenses and added a separate bullet ... [91]

**Commented [VM22326R325]:** Edits to address this comment will be reflected in next exposure

**Commented [CD327]:** Both net and gross cash flows have to be considered, so I don't agree with the addi ... [92]

**Commented [VM22328R327]:** Edits to address this comment will be reflected in next exposure

e.g. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.

f.h. If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.

**Guidance Note:** Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.1.b are before consideration of policy loans), less additional policy loan principal (but excluding policy loan interest that is added to the policy loan principal balance).

Guidance Note: Section 4.A.1 requires market value adjustments (MVAs) on liability cash flows to be reflected because in a cash flow model, assets are assumed to be liquidated at market value to cover the cash outflow of the cash surrender; therefore, inclusion of the market value adjustment aligns the asset and liability cash flows. This may differ from the treatment of MVAs in the definition of cash surrender value (Section 1.D), which defines the statutory reserve floor for which the values must be aligned with the annual statement value of the assets.

## 2. Grouping of Index Crediting Strategies

Index crediting strategies for non-variable annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy. In assigning each index crediting strategy to a grouping for projection purposes, the fundamental characteristics of the index crediting strategy shall be reflected, and the parameters shall have the appropriate relationship to the stochastically generated projection scenarios described in Section 8. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

Index accounts sharing similar index crediting strategies may also be grouped for modeling to an appropriately crafted proxy strategy normally expressed as a linear combination of recognized market indices, sub-indices or funds, in order to develop the investment return paths and associated interest crediting. Each index crediting strategy's specific risk characteristics, associated index parameters, and relationship to the stochastically generated scenarios in Section 8 should be considered before grouping or assigning to a proxy strategy. Grouping and/or development of a proxy strategy may not be done in a manner that intentionally understates the resulting reserve.

## 3. Model Cells

Projections may be performed for each contract in force on the date of valuation or by assigning contracts into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Assigning contracts to model cells may not be done in a manner that intentionally understates the resulting reserve.

**Commented [X329]:** Guidance Note regarding the market value adjustment seems still applies and should not be deleted. We reinstated the guidance note.

**Commented [VM22330R329]:** Subgroup ultimately decided to remove the guidance note, since it applies more to VM-21 products, is implied when assets are held at market value, and the reference to Section 4.A.1 is no longer applicable.

**Commented [X331]:** Suggest editing the first sentence to note scope is FIAs and to avoid confusion regarding the term "investment guideline" as follows: "Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy."

**Commented [VM22332R331]:** Edits to address this comment will be reflected in next exposure, with the exception that "fixed indexed annuities" will be changed to "non-variable annuities" per another ACLI comment to use a "fixed annuity" terminology, layered with a VM-22 Subgroup decision to refer to "non-variable annuity" instead of "fixed annuity".

4. Modeling of Hedges

a. For a company that does not have a future hedging program strategy tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:

i. The company shall not consider the cash flows from any future hedge purchases or any rebalancing of existing hedge assets in its modeling, since they are not included in the company's investment strategy supporting the contracts.

ii. Existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the starting assets. The hedge assets may then be considered in one of two ways:

a) ~~Include the asset cash flows from any contractual payments and maturity values in the projection model; or~~

b) ~~No hedge positions in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.~~

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

~~A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.~~

b. For a company that has one or more a future hedging strategies program tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:

i. For a hedging program with hedge payoffs that offset interest credits associated with indexed interest strategies (indexed interest credits):

a) In modeling cash flows, the company shall include the cash flows from future hedge purchases or any rebalancing of existing hedge assets that are intended solely to offset interest credits to ~~policyholders~~ contract holders.

b) Existing hedging instruments that are currently held by the company for this purpose offsetting the indexed credits in support of the contracts falling under the scope of these requirements shall be included in the starting assets. Existing hedging instruments that are currently held by the company not for any other purpose offsetting the indexed credits should be modeled consistently with the requirements of Section 4.A.4.a.ii.

**Commented [X333]:** Given that Section 9 covers hedging, we would suggest considering moving parts of Section 4.A.4 to that section.

**Commented [VM22334R333]:** The Subgroup is open to edits on restructuring VM-22 to move more detailed hedging requirements to Section 9. Will look for any comments during the exposure.

**Commented [X335]:** VM-22 took out the CDHS requirement and replaced it with "future hedging program". Future hedging should not materially reduce reserves or TAR if it is not well documented. The hedging DG is currently working on this for VM-20/VM-21. We will work with VM-22 subgroup to edit VM-22 accordingly.

**Commented [VM22336R335]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X337]:** Suggest rewording "Future hedging program" to "hedging program with future transactions" to avoid ambiguity.

**Commented [VM22338R337]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD339]:** The word "future" to describe the "hedging program" here is confusing. What about current hedging programs with expected future hedge purchases? Why not just say "hedging program"? Also, I wanted to note that removing the concept of CDHS creates inconsistency with both VM-20 and VM-21. Why not retain it?

**Commented [VM22340R339]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD341]:** same comment as above, about the word "future" being confusing

**Commented [VM22342R341]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD343]:** "contract holders"

**Commented [VM22344R343]:** Edits to address this comment will be reflected in next exposure

**Commented [X345]:** "Any other purpose" in the last sentence seems overly broad and should be narrowed.

**Commented [VM22346R345]:** Edits to address this comment will be reflected in next exposure

**Commented [X347]:** Specify "for this purpose" as "for offsetting the indexed credits", specify "for any other purposes" as "not for offsetting the indexed credits".

**Commented [VM22348R347]:** Edits to address this comment will be reflected in next exposure

c) An Index Credit Hedge Margin for these hedge instruments shall be reflected by reducing index interest credit hedge payoffs by a margin multiple that shall be justified by sufficient and credible company experience and be no less than [X%] multiplicatively of the interest credited. This margin is intended to cover sources of potential error due the hedging itself and the ability for the company to accurately model it. In the absence of sufficient and credible company experience, a margin of [Y%] shall be assumed. There is no cap on the index credit hedge margin if company experience indicates actual error is greater than [Y%]. It is permissible to substitute stress-testing for sufficient and credible experience if such stress-testing comprehensively considers a robust range of future market conditions.

ii. For a company with any future hedging strategies that hedges any contractual obligation or risks other than indexed interest credits, the detailed requirements for the modeling of hedges are defined in Section 9. The following requirements do not supersede the detailed requirements.

a) The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the projections used in the determination of the stochastic reserve SR.

b) The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future. Because models do not always accurately portray the results of hedge programs, the company shall, through back-testing and other means, assess the accuracy of the hedge modeling. The company shall determine a stochastic reserve SR as the weighted average of two CTE values; first, a CTE70 (“best efforts”) representing the company’s projection of all of the hedge cash flows, including future hedge purchases, and a second CTE70 (“adjusted”) which shall use only hedge assets held by the company on the valuation date and only future hedge purchases associated with indexed interest credited. These are discussed in greater detail in Section 9. The SR shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E)I determined following the guidance of Section 9.C.4.

c) Consistent with Section 4.A.4.b.i., if the company has an indexed credit hedging program, the index credit hedge margin for instruments associated with indexed interest credited shall be reflected by reducing hedge payoffs by a margin multiple as defined in Section 4.A.4.b.i.c.) in both the “best efforts” run and the “adjusted” run.

**Commented [X349]:** We believe the company should determine the appropriate margin based on the demonstration of effectiveness. Any guardrails on these undetermined values should be minimal, including as low as 0, subject to the appropriate demonstration of effectiveness. Further, we believe that documentation of effective product management should be contemplated in addition to historical effectiveness.

**Commented [VM22350R349]:** Subgroup agreed to revisit this discussion after field testing.

**Commented [CD351]:** clarify verbiage by saying "hedge instruments" or "derivative instruments"

**Commented [VM22352R351]:** Edits to address this comment will be reflected in next exposure

**Commented [X353]:** It is not clear how the stress testing can be used to support the index credit hedge margin. It is a test of the modeled strategy not actual performance and does not reflect any model error. We suggest that both back testing and stress testing be required and elaborated further:

Clearly specify method and metrics used for the back testing with focus on all available recent relevant history, not limited to 12 months  
 Recommend defined stress periods for stress testing, e.g., 2008 financial crisis, 2020 COVID impaired market conditions.

**Commented [X354R353]:** We will repeat the comment from our first letter: "Regarding hedge breakage expense assumptions, are both sources of error reflected here - error in the hedging itself, and error in the ability to accurately model it? Should we be separately considering the two limitations to make sure they are both clear: 1) the real-world hedging error and 2) the modeling error in reflecting the future hedging? Current error factor discussions seem muddled."

**Commented [VM22355R353]:** The Subgroup decided to A) Remove the reference to stress testing and B) Add wording to clarify the hedging margin covers both real-world hedging error and modeling error.

**Commented [X356]:** Again, need to coordinate with Hedging DG.

**Commented [VM22357R356]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X358]:** Margins are discussed in a different section, so recommend deleting.

**Commented [VM22359R358]:** Subgroup is open to receiving edits on the upcoming exposure to move the indexed credit hedging program margin requirements to a different section.

**Commented [X360]:** Edits were made to provide context and clarification for the requirements.

**Commented [VM22361R360]:** Edits to address this comment will be reflected in next exposure

- d) The use of products not falling under the scope of these VM-22 PBR Section 1 through 13 requirements (e.g., variable annuities) (e.g., equity indexed annuities) as a hedge shall not be recognized in the determination of accumulated deficiencies.

**Guidance Note:** Section 4.A.4.b.i is intended to address common situations for products with index crediting strategies where the company only hedges index credits or clearly separates index credit hedging from other hedging. In this case the hedge positions are considered similarly to other fixed income assets supporting the contracts, and a margin is reflected rather than modeling using a CTE70 adjusted run with no future hedge purchases. If a company has a more comprehensive hedge strategy combining index credits, guaranteed benefit, and other risks (e.g., full fair value or economic hedging), an appropriate and documented bifurcation method should be used in the application of sections 4.A.4.b.i and 4.A.4.b.ii above for the hedge modeling and justification. Such bifurcation methods may quantify the specific risk exposure attributable to index credit liabilities versus other liabilities such as guaranteed living benefits, and apply such for the basis for allocation.

**Guidance Note:** The requirements of Section 4.A.4 govern the determination of reserves for annuity contracts and do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

5. Revenue Sharing

If applicable, projections of accumulated deficiencies may include income from projected future revenue sharing, net of applicable projected expenses (net revenue-sharing income) if each of the following requirements set forth in VM-21 Sections 4.A.5.a through 4.A.5.f are met.

6. Length of Projections

Projections of accumulated deficiencies shall be run for as many future years as needed so that no materially greater reserve value would result from longer projection periods. Obligations remain at the end of the projection periods. Company can choose to run a shorter projection period but not shorter than 20 years and include the present value of the terminal benefits and expenses in the accumulated deficiency calculation.

7. Interest Maintenance Reserve (IMR)

The IMR shall be handled consistently with the treatment in the company's cash flow testing, and the amounts should be adjusted to a pre-tax basis.

B. Determination of Scenario Reserve

1. For a given scenario, the scenario reserve shall be determined using one of two methods described below:

- a) The starting asset amount plus the greatest present value, as of the projection start date, of the projected accumulated deficiencies; or

**Commented [X362]:** Clarify that "these requirements" should be specified as "VM-22 PBR requirements". Again, we suggest reconsidering the use of "VM-23", though.

**Commented [VM22363R362]:** Edits to address this comment will be reflected in next exposure

**Commented [CD364]:** it might be helpful to keep the parenthetical statement, with "variable annuities" as the example

**Commented [VM22365R364]:** Edits to address this comment will be reflected in next exposure

**Commented [X366]:** Unclear why Revenue Sharing is considered for non-variable products, can probably delete.

**Commented [VM22367R366]:** Decided to keep the reference to revenue sharing for now, just in case.

**Commented [X368]:** Clarify that for revenue sharing, the entire subsection of VM-21 Section 4.A.5 applies.

**Commented [VM22369R368]:** Edits to address this comment will be reflected in next exposure

**Commented [CD370]:** The "requirements are met" list is only in Section 4.A.5.a. Was the intent also to define the amount of net revenue-sharing income allowed in the projections? If so, will need to add verbiage to reference VM-21 Section 4.A.5.a through 4.A.5.f.

**Commented [VM22371R370]:** Edits to address this comment will be reflected in next exposure

**Commented [X372]:** We recommend that the projection period requirement be in line with that of VM-20. Instead of meeting the immateriality requirement, calculate the present value of the terminal benefits and expenses and include it in the accumulated deficiency calculation.

**Commented [VM22373R372]:** The Subgroup agreed with keeping the edit in the first sentence to be consistent with VM-20. However, the Subgroup decided to remove the second sentence, now that there is an estimations, simplifications, and approximations section in the latest VM-22 draft.

**Commented [VM22374]:** See Bill Wilton's comment letter, expressing opposition to inclusion of pre-tax IMR.

**Commented [VM22375R374]:** Will refer to LATF

**Commented [CD376]:** should we consider these changes to VM-21 as well, for consistency?

**Commented [VM22377R376]:** Edits to address this comment will be reflected in next exposure

**Commented [X378]:** Section does not specify what the reserve floor shall be (if any) for contracts without cash surrender value.

**Commented [VM22379R378]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may ... [93]



**Guidance Note:** The greatest present value of accumulated deficiencies can be negative.

- b) The direct iteration method, where the scenario reserve is determined by solving for the amount of starting assets which, when projected along with all contract cash flows, result in the defeasement of all projected future benefits and expenses at the end of the projection horizon with no positive accumulated deficiencies at the end of any projection year during the projection period.

The scenario reserve for any given scenario shall not be less than the cash surrender value ~~(with any contractual market value adjustments)~~ in aggregate on the valuation date for the group of contracts modeled in the projection. In the case where assets supporting the liability are held at market value, the market value adjustment shall also be applied to the cash surrender value.

2. Discount Rates

In determining the scenario reserve, unless using the direct iteration method pursuant to Section 4.B.1.b, the accumulated deficiencies shall be discounted at the NAER on additional assets, as defined in Section 4.B.3.

3. Determination of NAER on Additional Invested Asset Portfolio

- a. The additional invested asset portfolio for a scenario is a portfolio of general account assets as of the valuation date, outside of the starting asset portfolio, that is required in that projection scenario so that the projection would not have a positive accumulated deficiency at the end of any projection year. This portfolio may include only (i) General Account assets available to the company on the valuation date that do not constitute part of the starting asset portfolio; and (ii) cash assets.

**Guidance Note:**

Additional invested assets should be selected in a manner such that if the starting asset portfolio were revised to include the additional invested assets, the projection would not be expected to experience any positive accumulated deficiencies at the end of any projection year.

It is assumed that the accumulated deficiencies for this scenario projection are known.

- b. To determine the NAER on additional invested assets for a given scenario:
  - i. Project the additional invested asset portfolio as of the valuation date to the end of the projection period,
    - a) Investing any cash in the portfolio and reinvesting all investment proceeds using the company's investment policy.
    - b) Excluding any liability cash flows.

**Commented [X380]:** For products that do not have a cash surrender value, it is recommended that VM-22 use a "working reserve" concept, similar to VM-21 Section 3 requirement. Otherwise, there will be an issue aggregating these with and without CSV.

**Commented [VM22381R380]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Commented [X382]:** For products with market value adjustment, needs to be floored at cash surrender value with MVA.

**Commented [VM22383R382]:** Ultimately decided to not include new language, and instead add a sentence proposing that the CSV floor have the MVA applied if assets supporting the liability are held at market value.

**Commented [X384]:** We believe that assets held in the separate account with performance not impacting policyholder benefits should be modeled consistent with how the business is managed.

**Commented [VM22385R384]:** ACLI will consider whether to propose potential language related to this comment for the next exposure

- c) Incorporating the appropriate returns, defaults and investment expenses for the given scenario.
- ii. If the value of the projected additional invested asset portfolio does not equal or exceed the accumulated deficiencies at the end of each projection year for the scenario, increase the size of the initial additional invested asset portfolio as of the valuation date, and repeat the preceding step.
- iii. Determine a vector of annual earned rates that replicates the growth in the additional invested asset portfolio from the valuation date to the end of the projection period for the scenario. This vector will be the NAER for the given scenario.
- iv. ~~If the depletion of assets within the projection results contain any unreasonably extremely high negative or positive NAER upon borrowing due to the depletion of assets in the denominator, the NAER shall may be reset to a more appropriate discount rate, which may be carried out by imposing upper/lower limits or by using another approach, subject to actuarial judgement, that is appropriately prudent for statutory valuation the assumed cost of borrowing associated with each projected time period, in accordance with Section 4.D.3.e, as a safe harbor.~~

**Guidance Note:** There are multiple ways to select the additional invested asset portfolio at the valuation date. Similarly, there are multiple ways to determine the earned rate vector. The company shall be consistent in its choice of methods, from one valuation to the next.

C. Projection Scenarios

1. Number of Scenarios

The number of scenarios for which the scenario reserve shall be computed shall be the responsibility of the company, and it shall be considered to be sufficient if any resulting understatement in the ~~stochastic reserve~~ SR, as compared with that resulting from running additional scenarios, is not material.

2. Economic Scenario Generation

Treasury Department interest rate curves, as well as investment return paths for index funds, equities, and fixed income assets shall be determined on a stochastic basis using the methodology described in Section 8. If the company uses a proprietary generator to develop scenarios, the company shall demonstrate that the resulting scenarios meet the requirements described in Section 8.

D. Projection of Assets

1. Starting Asset Amount

- a. For the projections of accumulated deficiencies, the value of assets at the start of the projection shall be set equal to the approximate value of statutory reserves at

**Commented [X386]:** The wording “unreasonably high” is not clear or appropriate. Recommend this requirement be revised as part of a holistic fix to address extreme outliers in NAER both on the low and high side to handle anomalies for all of VM-20, VM-21, and VM-22. Some upper/lower cutoffs could be used that depend on scenario returns.

**Commented [VM22387R386]:** No objections to new proposed language to change wording from “unreasonably high” to “extreme” and reflecting positive or negative discount rates.

**Commented [CD388]:** “unreasonably high” is not well defined. Also, do we need to consider guardrails in the case of “unreasonably high” positive NAERs, not just negative NAERs?

**Commented [VM22389R388]:** No objections to new proposed language to change wording from “unreasonably high” to “extreme” and reflecting positive or negative discount rates.

the start of the projection plus the allocated amount of PIMR attributable to the assets selected. Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:

- i. Any hedge instruments held in support of the contracts being valued; and
  - ii. An amount of assets held in the general account equal to the approximate value of statutory reserves as of the start of the projections less the amount in (i).
- b. If the amount of initial general account assets is negative, the model should reflect a projected interest expense. General account assets chosen for use as described above shall be selected on a consistent basis from one reserve valuation hereunder to the next.
2. Valuation of Projected Assets

For purposes of determining the projected accumulated deficiencies, the value of projected assets shall be determined in a manner consistent with their value at the start of the projection. For assets assumed to be purchased during a projection, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics. However, for derivative instruments that are used in hedging and are not assumed to be sold during a particular projection interval, the company may account for them at an amortized cost in an appropriate manner elected by the company.

**Guidance Note:** Accounting for hedge assets should recognize any methodology prescribed by a company's state of domicile.

3. General Account Assets
- a. General account assets shall be projected, net of projected defaults, using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested in a manner that is representative of and consistent with the company's investment policy, subject to the following requirements:
    - i. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments or a fixed or floating rate interest basis, shall be determined by the company as part of the model representation;
    - ii. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the projected Treasury Department curve along the relevant scenario and the requirements for gross asset spread assumptions stated below;

- iii. For purchases of public non-callable corporate bonds, follow the requirements defined in VM-20 Sections 7.E, 7.F and 9.F. The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four;
  - iv. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in VM-20 Section 9.F for interest rate swap spreads;
  - v. For purchases of other fixed income investments, if included in the ~~model~~ modeled company investment strategy, set assumed gross asset spreads over U.S. Treasuries in a manner that is consistent with, and results in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.
- b. ~~Notwithstanding the above requirements, the model aggregate reserve shall be the higher of that produced by the modeled company investment strategy and any non-prescribed asset spreads shall be adjusted as necessary so that the aggregate reserve is not less than that which would be obtained produced~~ by substituting an alternative investment strategy in which ~~all~~ the fixed income reinvestment assets ~~are~~ have the same weighted average life (WAL) as the reinvestment assets in the modeled company investment strategy and are all public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of:
- i. ~~5% Treasury~~
  - ii. ~~15~~ 20% PBR credit rating 3 (Aa2/AA)
  - iii. ~~40~~ 80% PBR credit rating 6 (A2/A)
  - iv. ~~40% PBR credit rating 9 (Baa/BBB)~~
- c. Any disinvestment shall be modeled in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable, provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period, taking into account duration, ratings, and other attributes of the borrowing mechanism. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with, but not necessarily the same as, the gross asset spreads in Section 4.D.4.a.iii and Section 4.D.4.a.iv, recognizing that initial assets that mature during the projection may have different characteristics than modeled reinvestment assets.

Commented [X390]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22391R390]: Edits to address this comment will be reflected in next exposure

Commented [CD392]: should this be "stochastic reserve", since this is within Section 4: Determination of Stochastic Reserve

Commented [VM22393R392]: Edits to address this comment will be reflected in next exposure

Commented [X394]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22395R394]: Edits to address this comment will be reflected in next exposure

Commented [CD396]: Suggest making this plural ("Treasuries") to be consistent with Section 13.B.9

Commented [VM22397R396]: Edits to address this comment will be reflected in next exposure

Commented [X398]: The proposed reinvestment mix comes from a different assumption context in current VM-22, i.e., it is designed to calculate the maximum allowed valuation interest rates, while the reinvestment mix for VM-22 PBR draft is to put a guardrail around the fixed income reinvestment assets. A guardrail is not intended to identify outliers and should not be tied to an average. The biggest concern is with the higher allocation percentage in BBB assets. The valuation manual should build an appropriate level of conservatism in the valuation standards instead of reflecting industry trends. By moving from VM-20 and VM-21 required mix of 50%/50% AA/A to the proposed mix, the gross spreads increased by 20-30 bps for almost all WAL. We do not object to using a lower credit quality guardrail to get rid of any excessive conservatism. We recommend considering and comparing with other alternative allocations, something between the current and the proposed, e.g., 20% AA and 80% A. This will help regulators make informed decisions. In any case, we should be consistent with VM-20 and VM-21. If a change is made, it needs to be for all three.

Commented [VM22399R398]: Varying opinions among the Subgroup. Voted to revisit and determine the guardrail after the field test.

Commented [CD400]: These references should be Section 4.D.3.a.iii and 4.D.3.a.v

Commented [VM22401R400]: Edits to address this comment will be reflected in next exposure

**Guidance Note:** This limitation is being referred to Life Actuarial (A) Task Force for review. The simple language above “provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period” is not intended to impose a literal requirement. It is intended to reflect a general concept to prevent excessively optimistic borrowing assumptions. It is recognized that borrowing parameters and rules can be complicated, such that modeling limitations may not allow for literal compliance, in every time step, as long as the reserve is not materially affected. However, if the company is unable to fully apply this restriction, prudence dictates that a company shall not allow borrowing assumptions to materially reduce the reserve.

4. Cash Flows from Invested Assets

a. Cash flows from general account fixed income assets, including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario.
- ii. Reflect asset default costs as prescribed in VM-20 Section 9.F and anticipated investment expenses through deductions to the gross investment income.
- iii. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.
- iv. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns or other economic values directly in the projection of asset cash flows. Asset defaults are not subject to this requirement, since asset default assumptions must be determined by the prescribed method in VM-20 Sections 7.E, 7.F and 9.F as noted in 4.a.ii above.

b. Cash flows from general account index funds and general account equity assets—i.e., non-fixed income assets having substantial volatility of returns, such as common stocks and real estate— including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Determine the grouping for asset categories and the allocation of specific assets to each category in a manner that is consistent with that used for index crediting strategies, as discussed in Section 4.A.2.
- ii. Project the gross investment return including realized and unrealized capital gains in a manner that is consistent with the stochastically generated scenarios.
- iii. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses through a deduction to the gross investment return using prudent estimate assumptions.

**Commented [X402]:** Correct an inaccurate VM section reference. The prescribed asset default spreads assumption should be referred to VM-20 Section 9.F. VM-20 Section 7.E and 7.F are requirements for reinvestment assets, disinvestment and cash flows for invested assets. In 7.F, VM-20 just refers to 9.F for defaults.

**Commented [VM22403R402]:** Edits to address this comment will be reflected in next exposure

**Commented [X404]:** Request clarification around the meaning of “general account index funds”.

**Commented [VM22405R404]:** Edits to address this comment will be reflected in next exposure

- c. Cash flows for each projection interval for policy loan assets shall follow the requirements in Section 10.H.

Commented [CD406]: should this reference Section 10.H?

E. Projection of Annuitization Benefits

Commented [VM22407R406]: Edits to address this comment will be reflected in next exposure

1. Assumed Annuitization Purchase Rates

- a. For payouts specified at issue (such as single premium immediate annuities, deferred income annuities, and certain structured settlements), such purchase rates shall reflect the payout rate specified in the contract.

Commented [CD408]: is there a difference between "purchase rates" and "payout rates"? Both terms are used, so that makes the language unclear. If they are the same, suggest sticking with "purchase rates".

- b. For purposes of projecting future elective annuitization benefits (including annuitizations stemming from the election of a GMIB) and withdrawal amounts from GMWBs, the projected annuitization purchase rates shall be determined assuming that market interest rates available at the time of election are the interest rates used to project general account assets, as determined in Section 4.D.4. In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract.

Commented [VM22409R408]: Edits to address this comment will be reflected in next exposure

Commented [X410]: Suggest deleting "In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract." as it appears to be covered by E.1.a.

2. Projected Election of GMIBs, GMWBs and Other Annuitization Options

Commented [VM22411R410]: Edits to address this comment will be reflected in next exposure

- a. For contracts projected to elect future annuitization options (including annuitizations stemming from the election of a GMIB) or for projections of GMWB benefits once the account value has been depleted, the projections may shall assume the contract will stay in force, the projected periodic payments are paid, and the associated maintenance expenses are incurred.

Commented [X412]: Reinstate the parenthetical content "(including annuitizations stemming from the election of a GMIB)" since there are GMIB riders attached to fixed annuity products.

Commented [VM22413R412]: Edits to address this comment will be reflected in next exposure

F. Frequency of Projection and Time Horizon

Commented [X414]: Delete sentence since it repeats 4.E.1.a.

- 1. Use of an annual cash-flow frequency ("timestep") is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of sensitivity to projection frequency should be validated by testing wherein the company should determine that the use of a more frequent—i.e., shorter—time step does not materially increase reserves. A more frequent time increment should always be used when the product features are sensitive to projection period frequency.

Commented [VM22415R414]: Edits to address this comment will be reflected in next exposure

Commented [X416]: Suggest deleting "may" as there appears to be only option.

Commented [VM22417R416]: Edits to address this comment will be reflected in next exposure

Care must be taken in simulating fee income and expenses when using an annual time step. For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption. It is also important that the frequency of the investment return model be linked appropriately to the projection horizon in the liability model. In particular, the horizon should be sufficiently long so as to capture the vast majority of costs (on a present value basis) from the scenarios.

Commented [X418]: Projection Period is already covered in 4.A.6. Should not be in two places with different guidance.

Commented [VM22419R418]: Edits to address this comment will be reflected in next exposure

Commented [X420]: Reinstate the deleted example of "For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption."

**Guidance Note:** As a general guide, the forecast horizon should not be less than 20 years.

Commented [VM22421R420]: Edits to address this comment will be reflected in next exposure

G. Compliance with ASOPs

When determining a stochastic reserve SR, the analysis shall conform to the ASOPs as promulgated from time to time by the ASB.

Under these requirements, an actuary will make various determinations, verifications and certifications. The company shall provide the actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in these requirements and responsibilities arising from each applicable ASOP.

Section 5: Reinsurance Ceded and Assumed

A. Treatment of Reinsurance Ceded in the Aggregate Reserve

1. Aggregate Reserve Pre- and Post-Reinsurance Ceded

As noted in Section 3.B, the aggregate reserve is determined both pre-reinsurance ceded and post-reinsurance ceded. Therefore, it is necessary to determine the components needed to determine the aggregate reserve—i.e., the stochastic reserve, additional standard projection amount, the SR, DR, and/or the reserve amount valued using requirements in VM-A and VM-C, as applicable—on both bases. Sections 5.A.2 and 5.A.3 discuss adjustments to inputs necessary to determine these components on both a post-reinsurance ceded and a pre-reinsurance ceded basis. Note that due allowance for reasonable approximations may be used where appropriate.

2. Stochastic Reserve

Reflection of Reinsurance Cash Flows in the DR or SR

- a. In order to determine the aggregate reserve post-reinsurance ceded, accumulated deficiencies, scenario reserves, and the resulting stochastic reserve SR and DR shall be determined reflecting the effects of reinsurance treaties that meet the statutory requirements that would allow the treaty to be accounted for as reinsurance within statutory accounting. This involves including, where appropriate, all projected reinsurance premiums or other costs and all reinsurance recoveries, where the reinsurance cash flows reflect all the provisions in the reinsurance agreement, using prudent estimate assumptions.
  - i. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.
  - ii. All significant terms and provisions within reinsurance treaties shall be reflected. In addition, it shall be assumed that each party is knowledgeable about the treaty provisions and will exercise them to their advantage.

**Guidance Note:** Renegotiation of the treaty upon the expiration of an experience refund provision or at any other time shall not be assumed if such would be beneficial to the company and not beneficial to the counterparty. This is applicable to both the ceding party and assuming party within a reinsurance arrangement.

- iii. If the company has knowledge that a counterparty is financially impaired, the company shall establish a margin for the risk of default by the counterparty. In the absence of knowledge that the counterparty is financially impaired, the company is not required to establish a margin for the risk of default by the counterparty.
- iv. A company shall include the cash flows from a reinsurance agreement or amendment in calculating the stochastic aggregate reserve if such qualifies for credit in compliance with Appendix A-791 of the Accounting Practices and Procedures Manual. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum aggregate reserve by the absolute value of such reductions in surplus.

**Commented [X422]:** The wording and titling may need to be tightened due to clarify which items apply to assumed and ceded reinsurance in the text.

**Commented [VM22423R422]:** Edits to address this comment will be reflected in next exposure

**Commented [X424]:** Delete and just have title be "Reinsurance". Should structure be more like VM-20?

**Commented [X425R424]:** I, II (and III—VM-21 needs edits)

**Commented [VM22426R424]:** Edits to address this comment will be reflected in next exposure

**Commented [CD427]:** "and Assumed" is added here, but there is still only a subsection 5.A that addresses reinsurance ceded (at least in the section header).

**Commented [VM22428R427]:** Edits to address this comment will be reflected in next exposure

**Commented [CD429]:** need to add "and Assumed" here?

**Commented [VM22430R429]:** Edits to address this comment will be reflected in next exposure

**Commented [X431]:** reinstate

**Commented [VM22432R431]:** Edits to address this comment will be reflected in next exposure

**Commented [X433]:** Can take out vague approximation references, since now have a general allowance for appropriate approximations.

**Commented [VM22434R433]:** Edits to address this comment will be reflected in next exposure

**Commented [X435]:** Consistent with VM-20

**Commented [VM22436R435]:** Edits to address this comment will be reflected in next exposure

**Commented [X437]:** VM-20 Section 8.A.1 makes sense here as well.

**Commented [VM22438R437]:** Edits to address this comment will be reflected in next exposure

**Commented [CD439]:** should this be "stochastic reserve"?

**Commented [VM22440R439]:** Edits to address this comment will be reflected in next exposure

**Commented [X441]:** VM-22 draft so far uses aggregate, not minimum.

**Commented [VM22442R441]:** Edits to address this comment will be reflected in next exposure



- b. In order to determine the ~~stochastic reserve~~ SR and DR on a pre-reinsurance ceded basis, accumulated deficiencies, scenario reserves, and the resulting ~~stochastic reserve~~ SR and DR shall be determined ignoring the effects of reinsurance ceded within the projections. Different approaches may be used to determine the starting assets on the ceded portion of the contracts, dependent upon the characteristics of a given treaty:
- i. For a standard coinsurance treaty, where the assets supporting the ceded liabilities were transferred to the assuming reinsurer, one acceptable approach involves a projection based on using starting assets on the ceded portion of the policies that are similar to those supporting the retained portion of the ceded policies or supporting similar types of policies. Scaling up each asset supporting the retained portion of the contract is also an acceptable method.

**Guidance Note:** For standard pro rata insurance treaties ~~(does that do not include experience refunds)~~, where allocated expenses are similar to the renewal expense allowance, reflecting the quota share applied to the present value of future reinsurance cash flows pertaining to the reinsured block of business may be considered as a possible approach to determine the ceded reserves.

- ii. Alternatively, a treaty may contain an identifiable portfolio of assets associated with the ceded liabilities. This could be the case for several forms of reinsurance: funds withheld coinsurance; modified coinsurance; coinsurance with a trust. To the extent these assets would be available to the cedant, an acceptable approach could involve modeling this portfolio of assets. To the extent that these assets were insufficient to defease the ceded liabilities, the modeling would partially default to the approach discussed for a standard coinsurance treaty. To the extent these assets exceeded what might be needed to defease the ceded liabilities (perhaps an over collateralization requirement in a trust), the inclusion of such assets shall be limited.

**Guidance Note:** Section 3.5.2 in ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*, provides possible methods for constructing a hypothetical pre-reinsurance asset portfolio, if necessary, for purposes of the pre-reinsurance reserve calculation.

- c. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
- d. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the NGE in reinsurance cash flows, the company shall include, but not be limited to, the following:
- i. The usual and customary practices associated with such agreements.
  - ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
  - iii. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
  - iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.

Commented [X443]: Correct phrasing.

Commented [VM22444R443]: Edits to address this comment will be reflected in next exposure

- v. Actions that might be taken by a party if the counterparty is in financial difficulty.
- e. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:
  - i. Stochastically model the risk factors directly in the cash-flow model when calculating the SR.
  - ii. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the SR to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is longevity reinsurance.

### 3. Reserve Determined Upon Passing the Exclusion Test

If a company passes the stochastic exclusion test and elects to use a methodology pursuant to applicable Sections VM-A and VM-C, as allowed in Section 3.E, it is important to note that the methodology produces reserves on a pre-reinsurance ceded basis. Therefore, the reserve must be adjusted for any reinsurance ceded accordingly. In addition, reserves valued under applicable Sections in VM-A and VM-C, unadjusted for reinsurance, shall be applied to the contracts falling under the scope of these requirements to determine the aggregate reserve prior to reinsurance.

It should be noted that the ~~pre-reinsurance-ceded~~ and ~~post-reinsurance-ceded~~ reserves may result in different outcomes for the exclusion test. In particular, it is possible that the ~~pre-reinsurance-ceded~~ reserves would pass the relevant exclusion test (and allow the use of VM-A and VM-C) while the ~~post-reinsurance-ceded~~ reserves might not, or vice versa.

### 4. Additional Standard Projection Amount

Where reinsurance is ceded, the additional standard projection amount shall be calculated as described in Section 6 to reflect the reinsurance costs and reinsurance recoveries under the reinsurance treaties. The additional standard projection amount shall also be calculated pre-reinsurance ceded using the methods described in Section 6 but ignoring the effects of the reinsurance ceded.

**Commented [X445]:** VM-20 Section 8.C.7 seems particularly applicable. We encourage others to also review VM-20 Section 8 for other sections that should also apply. VM-20 Section 8 is much more developed than VM-20 Section 5 with many more considerations for assumption setting, and we would suggest the VM-22 subgroup consider rewriting starting with VM-20 instead of VM-21.

**Commented [VM22446R445]:** Subgroup agreed with reflecting this language in the VM-22 draft

**Commented [VM22447]:** Per discussion on how to model mortality for longevity reinsurance, the VM-22 Subgroup decided to port over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk.

**Commented [X448]:** Both referring to reinsurance ceded. Should be clarified.

**Commented [VM22449R448]:** Edits to address this comment will be reflected in next exposure

**Commented [X450]:** ceded

**Commented [VM22451R450]:** Edits to address this comment will be reflected in next exposure

**Commented [X452]:** ceded

**Commented [VM22453R452]:** Edits to address this comment will be reflected in next exposure

**Commented [X454]:** Opposite could also be true.

**Commented [VM22455R454]:** Edits to address this comment will be reflected in next exposure

**Commented [X456]:** The current VM-21 language here looks to work for VM-22 without needing to know the specific assumptions, etc., for the SPA.

**Commented [VM22457R456]:** Edits to address this comment will be reflected in next exposure

Section 6: Standard Projection Amount To Be Determined

**Commented [VM22458]:** NY Comment Letter: Current CARVM standards should be a minimum floor for VM-22 policies, and only the stochastic reserve should permit grouping whereas the minimum floor should be seriatim.

**Commented [VM22459R458]:** The Subgroup will discuss the standard projection amount at a later point

**Commented [X460]:** SPA Section placement here still makes sense, but SPA under development.

**Commented [VM22461R460]:** Edit to update the title of this section will be reflected in next exposure

**Commented [VM22462]:** Refer to equitable comment letter, which expresses support for the standard projection amount as a binding floor, with the suggestion to rely on company-specific assumptions for insignificant assumptions that are difficult to develop.

**Commented [VM22463R462]:** The Subgroup will discuss the standard projection amount at a later point

**Commented [NJ464]:** Once this is written, the language from 4.A.1.a for longevity reinsurance could be added here as well, i.e. the standard projection would use net premiums based on the k factor approach, using the standard projection prescribed assumptions. Floor on std projection is at the contract level

**Commented [VM22465R464]:** The Subgroup will discuss the standard projection amount at a later point

| Section 6: To Be Determined

Section 7: Exclusion Testing

A. Stochastic Exclusion Test Requirement Overview

1. The company may elect to exclude one or more groups of contracts from the stochastic reserve SR calculation if the stochastic exclusion test (SET) is satisfied for each of the group of contracts. The company has the option to calculate or not calculate the SET.
  - a. If the company does not elect to calculate the SET for one or more groups of contracts, or the company calculates the SET and fails the test for such groups of contracts, the reserve methodology described in Section 4 shall be used for calculating the aggregate reserve for those groups of contracts.
  - b. If the company elects to calculate the SET for one or more groups of contracts, and passes the test for such groups of contracts, then for each group of contracts that passes the SET, the company shall choose whether or not to use the reserve methodology described in Section 4 for those groups that group of contracts. If the reserve methodology described in Section 4 is not used for one or more groups of contracts, then the company shall use the reserve methodology pursuant to applicable requirements in VM-A and VM-C to calculate the aggregate reserve for those groups of contracts.
  - c. A company may not exclude a group of contracts from the stochastic reserve SR requirements if there are one or more future hedging strategies programs associated with supporting the contracts, with the exception of hedging programs solely supporting index credits as described in Section 9.A.1.
  - d. A company may elect to automatically exclude one or more groups of policies from the stochastic reserve calculation without passing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
    - i. All of the contracts are either:
      - Single Premium Immediate Annuities,
      - Term Certain Payout Annuities, or
      - Structured Settlement Contracts;
    - ii. None of the contracts are pension risk transfer annuities (PRT) or are covered under a longevity reinsurance agreement;
    - iii. Future payout benefits are either level or stay within 5% of the initial payout benefit amount over time;
    - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
    - v. The average [Macauley duration] of the liabilities of the contracts as measured from the issue date (or premium determination date) is less than [X].

B. Requirement to Pass the Types of Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

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- Commented [X466]:** Need to modify exclusion testing section to reflect SPA.
- Commented [VM22467R466]:** The Subgroup will discuss the standard projection amount at a later point
- Commented [NJ468]:** Longevity reinsurance likely to be scoped out of the stochastic reserve unless the stochastic reserve includes consideration of stochastic mortality. If it stays as stochastic interest only, then it probably does make sense that it would meet the exclusion testing. For exclusion testing, the k factor approach should continue to apply, and it should not be combined with other blocks of business
- Commented [VM22469R468]:** VM-22 Subgroup will discuss this comment as part of addressing the longevity reinsurance exposure in future discussions
- Commented [X470]:** inconsistent groups vs. group references.
- Commented [VM22471R470]:** Edits to address this comment will be reflected in next exposure
- Commented [CD472]:** should this be "stochastic reserve", since Section 4 is about determining the st... [94]
- Commented [VM22473R472]:** Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve... [95]
- Commented [X474]:** Decision is independent for each group the SET is performed on.
- Commented [VM22475R474]:** Edits to address this comment will be reflected in next exposure
- Commented [CD476]:** suggest deleting this highlighted part of the sentence
- Commented [VM22477R476]:** Edits to address this comment will be reflected in next exposure
- Commented [CD478]:** see earlier comment about the phrase "future hedge program" being confusing.
- Commented [VM22479R478]:** Subgroup decided to use consistent language as the changes made to VM-21... [96]
- Commented [X480]:** Is "associated with the contracts" the same as the earlier use of "supporting the contra... [97]
- Commented [VM22481R480]:** Academy will consider potential language to be more specific with respect... [98]
- Commented [VM22482]:** Subgroup voted to permit... below a certain duration to automatically pass... [99]
- Commented [VM22483]:** New language drafted by select Subgroup Members to provide certain condi... [100]
- Commented [VM22484R483]:** Academy will provide a proposed durational threshold in this language dur... [101]
- Commented [CD485]:** Suggest renaming this section header/name to "Requirements to Pass the SET".... [102]
- Commented [VM22486R485]:** Edits to address this comment will be reflected in next exposure

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date~~within 12 months before the valuation date~~ the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. SET Certification Method—For groups of contracts that do not have guaranteed living benefits, ~~future hedging programs~~ strategies, or pension risk transfer ~~business~~, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material aggregate risk levels across interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments). ~~The company shall provide the certification and documentation supporting the certification to the commissioner upon request.~~

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

- a) A demonstration that, using requirements under VM-A and VM-C for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great as the assets required to support the group of contracts and certificates using the company’s cash-flow testing model under each of the ~~1648~~ scenarios identified in this sectionSection 7.C.1 or alternatively each of the New York seven scenarios-economic scenarios-under each of the three mortality adjustment factors identified in Section 7.C.1.
- b) A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
- c) A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company’s non-guaranteed elements (NGEs) policy, assets backing the group of contracts, the company’s longevity risk, and the company’s investment strategy.

C. Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the stochastic reserveSR requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of (b-a)/a is less than the lesser/greater of [x]% where and the percentage change that would trigger the company’s materiality standard, where:

Commented [CD487]: not sure why this part is ... [103]

Commented [VM22488R487]: Edits to address ... [104]

Commented [X489]: We recommend removing ... [105]

Commented [VM22490R489]: Subgroup voted ... [106]

Commented [CD491]: See earlier comments abo ... [107]

Commented [VM22492R491]: The Subgroup de ... [108]

Commented [X493]: Needs to be defined.

Commented [VM22494R493]: The Subgroup de ... [109]

Commented [X495]: Needs a comma

Commented [VM22496R495]: Edits to address ... [111]

Commented [CD497]: need comma after "business"

Commented [VM22498R497]: Edits to address ... [110]

Commented [CD499]: what is meant by "aggre ... [112]

Commented [VM22500R499]: Edits to address ... [113]

Commented [X501]: This is not in VM-20 and we ... [114]

Commented [VM22502R501]: Edits to address ... [115]

Commented [X503]: This is covered by VM-31

Commented [VM22504R503]: Edits to address ... [116]

Commented [CD505]: note, there is no insertion ... [117]

Commented [VM22506R505]: Edits to address ... [118]

Commented [CD507]: This wording is a little clu ... [119]

Commented [VM22508R507]: Edits to address ... [120]

Commented [X509]: Replace all "contracts" with ... [122]

Commented [VM22510R509]: Edits to address ... [121]

Commented [X511]: Need mortality stresses if using NY7

Commented [VM22512R511]: No objections fr ... [123]

Commented [X513]: Need complete list of risks

Commented [VM22514R513]: Edits to address ... [124]

Commented [CD515]: need to insert "longevity risk" here

Commented [VM22516R515]: Edits to address ... [125]

Commented [X517]: Need complete list of risks

Commented [VM22518R517]: Edits to address ... [126]

Commented [X519]: Need to add a review of the ... [127]

Commented [VM22520R519]: Edits to address ... [128]

Commented [X521]: As written, the SERT assum ... [129]

Commented [VM22522R521]: Consensus to us ... [130]

Commented [X523]: Using (a) in the denominator ... [131]

Commented [VM22524R523]: Consensus to us ... [132]

Commented [X525]: The variability should be as ... [133]

Commented [VM22526R525]: No objections fr ... [134]

- a. a = the adjusted scenario reserve described in Paragraph 7.C.2.a below using economic scenario 9, and 100% as the adjustment factor for mortality, the baseline economic scenario, as described in Appendix 1.E of VM-20.
- b. b = the largest adjusted scenario reserve described in Paragraph 7.C.2.b below under any of the other 15 economic scenarios described in Appendix 1.E of VM-20 under both [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company's margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company's margin for this exercise.

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve for scenarios other than the baseline economic scenario, minus the adjusted scenario reserve for the baseline economic scenario, and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of b.

2. In calculating the ratio in subsection (Section 7.C.1) above:

- a. The company shall calculate an adjusted scenario reserve for the group of contracts for each of each of the 16 scenario economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:
  - i. The scenario reserve defined in Section 4, but with the following differences:
    - a) Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Paragraph Section 7.C.1.b of this section.
    - b) Using the interest rates and equity return assumptions specific to each scenario.
    - c) Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
    - d) Shall reflect future mortality improvement in line with anticipated experience assumptions.
    - e) Shall not reflect correlation between longevity and economic risks.
  - ii. The gross premium reserve developed from the cash flows from the company's asset adequacy analysis models, using the experience assumptions of the company's cash-flow analysis, but with the following differences:
    - a) Using the interest rates and equity return assumptions specific to each scenario.

- Commented [X527]: Correcting reference
- Commented [VM22528R527]: Edits to address this comment will be reflected in next exposure
- Commented [CD529]: better to keep the reference to the full Section (i.e., Section 7.C.2.a.i)
- Commented [VM22530R529]: Edits to address this comment will be reflected in next exposure
- Commented [X531]: Correcting reference
- Commented [VM22532R531]: Edits to address this comment will be reflected in next exposure
- Commented [CD533]: better to keep the reference to the full Section (i.e., Section 7.C.2.b)
- Commented [VM22534R533]: Edits to address this comment will be reflected in next exposure
- Commented [X535]: Need to modify in case largest result is just from the mortality stress on the same scenario.
- Commented [VM22536R535]: Edits to address this comment will be reflected in next exposure
- Commented [X537]: Need to modify in case largest result is just from the economic stress on the same mortality level.
- Commented [VM22538R537]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X539]: Need to ensure we have captured a prudent level of mortality variation for any given company in this test.
- Commented [VM22540R539]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X541]: Updating to reflect mortality/economic scenario combinations.
- Commented [VM22542R541]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X543]: For clarity
- Commented [VM22544R543]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X545]: Be consistent with standard VM references
- Commented [VM22546R545]: Edits to address ... [137]
- Commented [CD547]: better to keep the referenc ... [136]
- Commented [VM22548R547]: Edits to address ... [135]
- Commented [CD549]: why delete this? seems ... [139]
- Commented [VM22550R549]: Edits to address ... [138]
- Commented [X551]: Be consistent with standar ... [140]
- Commented [VM22552R551]: Edits to address ... [141]
- Commented [CD553]: better to reference the f ... [142]
- Commented [VM22554R553]: Edits to address ... [143]

- b) Using the mortality scalars described in ~~Paragraph~~ Section 7.C.1.b of this section.
  - c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the company’s cash-flow testing assumptions for default costs and reinvestment earnings.
- b. ~~The company shall use the most current 16 available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.~~
- c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
- d. ~~The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.~~
- e. ~~If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to not conduct the stochastic exclusion ratio test under only a pre-reinsurance-ceded basis upon determining the , either pre-reinsurance-ceded basis upon determining the prior post-reinsurance-reserve-ceded-aggregate reserve.~~
3. ~~If the ratio calculated in this section is less than [x]% pre-non-proportional reinsurance, but is greater than [x]% post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.~~

**Guidance Note:** Further description of non-proportional reinsurance is provided in Paragraph 16 of SSAP 61R.

- a. An example of an acceptable demonstration:
- i. For convenience in notation •  $SERT = \frac{b-a}{a}$  defined in Section 7.C.1 above
    - a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted  $SERT_{gn}$
    - b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted  $SERT_{nn}$
  - ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-

**Commented [X555]:** Be consistent with standard VM references

**Commented [VM22556R555]:** Edits to address this comment will be reflected in next exposure

**Commented [CD557]:** better to reference the full Section

**Commented [VM22558R557]:** Edits to address this comment will be reflected in next exposure

**Commented [X559]:** No reason for change/inconsistency with other chapters - reject edit.

**Commented [VM22560R559]:** Edits to address this comment will be reflected in next exposure

**Commented [X561]:** Clarification is needed around reference to “significantly different risk profiles”.

**Commented [VM22562R561]:** Subgroup voted to use the “significantly different risk profiles” language for the exclusion test, consistent with VM-20.

**Commented [CD563]:** to be more specific, say “stochastic exclusion ratio test”

**Commented [VM22564R563]:** Edits to address this comment will be reflected in next exposure

**Commented [X565]:** Original did not make sense. Also, the point is that you just need one basis, either pre-reinsurance or post-reinsurance.

**Commented [VM22566R565]:** Edits to address this comment will be reflected in next exposure

**Commented [X567]:** We request clarification or definition of the term “non-proportional reinsurance”.

**Commented [VM22568R567]:** Added a guidance note to refer to paragraph 16 in SSAP 61R to provide the definition of non-proportional reinsurance.

**Commented [X569]:** Does this make sense for VM-20 as well?

**Commented [VM22570R569]:** Subgroup to only focus on VM-22 for now



proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.

- iii. So, if  $SERT_{gn} \leq [x]_{t-1}\%$  but  $SERT_{nn} > [x]_{t-1}\%$ , then compute the largest percent increase in reserve (LPIR) =  $(b-a)/a$ , both “gross of non-proportional” and “net of non-proportional.”

$$LPIR_{gn} = (b_{gy} - a_{gy}) / (b_{gn} - a_{gn}) / a_{gn}$$

$$LPIR_{nn} = (b_{ny} - a_{ny}) / (b_{nn} - a_{nn}) / a_{nn}$$

Note that the scenario underlying  $b_{gn}$  could be different from the scenario underlying  $b_{nn}$ .

If  $SERT_{gn} \times LPIR_{nn} / LPIR_{gn} < [x]_{t-1}\%$  then the block of contracts passes the SERT.

- b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 1648 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.

- 4. The SERT may not be used for a group of contracts if, using the current year’s data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method in this section of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in this section and concluded that such certification could not legitimately be made.

D. Stochastic Exclusion Demonstration Test

- 1. In order to exclude a group of contracts from the stochastic reserve SR requirements using the methodology in this section Stochastic Exclusion Demonstration Test, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:

- a. The demonstration shall provide a reasonable assurance that if the stochastic reserve SR was calculated on a stand-alone basis for the group of contracts subject to the stochastic reserve SR exclusion, the resulting stochastic reserve for those groups of contracts would not be higher than the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of contracts from the stochastic reserve SR requirements.

- b. If, as of the end of any calendar year, the company determines the aggregate statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C for the group of contracts no longer adequately provides for all material risks, the exclusion shall be discontinued, and the company fails the SERT SET for those contracts.

Commented [X571]: We believe subscript “gy” should be “gn”.

Commented [VM22572R571]: Edits to address this comment will be reflected in next exposure

Commented [X573]: % missing

Commented [VM22574R573]: Edits to address this comment will be reflected in next exposure

Commented [X575]: Note that LPIR is just the SERT using the VM-22 formulation (b-a)/a.

Commented [VM22576R575]: Edits to address this comment will be reflected in next exposure

Commented [X577]: The first and last terms on the left side of this equation cancel out, so it just ends up with needing to pass the SERT on the net basis again. This worked when (c) was the denominator, but now with (a) in the denominator this adjustment is meaningless. Take out the whole example, or revise the SERT to use benefits in the denominator again. Or some new formulation for SERT.

Commented [VM22578R577]: Updated denominator to be consistent with VM-20, which should address issue

Commented [X579]: In VM-20, it is only prohibited for the clearly sufficiently robust attempts of the demonstration method where failing shows the SR would be greater. The other two options could have been incomplete demonstrations and not necessarily imply the SR would be dominant.

Commented [VM22580R579]: No objections from the Subgroup to adding this language

Commented [X581]: Clearer language

Commented [VM22582R581]: Edits to address this comment will be reflected in next exposure

Commented [X583]: Does this statement imply a floor reserve of VM-A and VM-C? VM-20 does require the NPR as the floor of the reserve but as written, VM-22 does not require a floor reserve. Recommend removing 1.a. Same statement with the 2.a statement demonstration. This requirement does not apply to the other permitted tests, which seemed counterintuitive.

Commented [VM22584R583]: ACLI will follow-up on whether to recommend removing this paragraph/option or only a specific statement within the paragraph.

Commented [CD585]: should this, instead, refer to the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C?

Commented [VM22586R585]: Edits to address this comment will be reflected in next exposure

Commented [X587]: Typo is also in VM-20

Commented [VM22588R587]: Will follow-up upon addressing VM-30 disclosure requirements

- c. The demonstration may be based on analysis from a date that precedes the valuation date for the initial year to which it applies if the demonstration includes an explanation of why the use of such a date will not produce a material change in the outcome, as compared to results based on an analysis as of the valuation date.
  - d. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques, such as derivative programs and reinsurance.
2. The company may use one of the following or another method acceptable to the insurance commissioner to demonstrate compliance with ~~subsection~~Section 7.D.1 above:
- a. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis.
  - b. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios.
  - c. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis, but using a representative sample of contracts in the ~~stochastic reserve~~SR calculations.
  - d. Demonstrate that any risk characteristics that would otherwise cause the ~~stochastic reserve~~SR calculated on a stand-alone basis to exceed the statutory reserve calculated in accordance with VM-A and VM-C, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance or passing the risk on to the ~~contract policyholder~~ by contract provision.

E. Deterministic Certification Option

- 1. The company ~~has the option to may~~ determine the ~~stochastic reserve~~SR for a group of contracts using a single deterministic economic scenario, subject to the following conditions.
  - a. The company certifies that economic conditions do not materially influence anticipated contract holder behavior for the group of ~~policies, contracts and certificates~~. Examples of contract holder options that are materially influenced by economic conditions include surrender benefits, recurring premium payments, and guaranteed living benefits.
  - b. The company certifies that the group of ~~policies, contracts and certificates~~ is not supported by a reinvestment strategy that contains ~~future hedge purchases~~.
  - c. ~~The company must perform and disclose results from the stochastic exclusion ratio test following the requirements in Section 7.C, thereby disclosing and the scenario reserve volatility across various~~company must pass the SERT when ~~considering only the 16 economic scenarios; paired with the 100% mortality scenario~~.

Commented [CD589]: should say "Section"

Commented [VM22590R589]: Edits to address this comment will be reflected in next exposure

Commented [CD591]: "contract holder"

Commented [VM22592R591]: Edits to address this comment will be reflected in next exposure

Commented [X593]: Need SPA for DR as well as SR

Commented [VM22594R593]: Will discuss the standard projection amount further on future calls

Commented [CD595]: suggest saying "may" instead of "has the option to"

Commented [VM22596R595]: Edits to address this comment will be reflected in next exposure

Commented [CD597]: "contracts"

Commented [VM22598R597]: Edits to address this comment will be reflected in next exposure

Commented [X599]: Clarify if this was the intent to exclude contracts supported by index hedging.

Commented [VM22600R599]: The Academy's intent was to also have this condition apply to hedge purchases supporting index credits. Therefore, no changes were made to the language.

Commented [X601]: ~~this is needed to assure the SR is not needed. Otherwise, this section is incomplete and does not support using a DR~~

Commented [VM22602R601]: Subgroup agrees with including the 100% mortality scenario.

- d. The company must disclose a description of contracts and associated features in the certification.

~~Drafting Note: Consider revisiting Paragraph E.1.c to possibly either require i) falling below a preset threshold for the exclusion ratio test under a single longevity/mortality scenario; or ii) to pass the exclusion test if longevity is not included as part of the ratio test.~~

- 2. The ~~stochastic reserve~~SR for the group of contracts under the Deterministic Certification Option is determined as follows:

- a. Cash flows are projected in compliance with the applicable requirements in Section 4, Section 5, Section 10, and Section 11 of VM-22 over a single economic scenario (scenario 12 found in Appendix 1 of VM-20).
- b. The ~~stochastic reserve~~SR equals the scenario reserve following the requirements for Section 4.

~~Guidance Note: The Deterministic Certification Option is intended to provide a non stochastic option for Single Premium Immediate Annuities (SPIAs) and similar payout annuity products that contain limited or no optionality in the asset and liability cash flow projections.~~

Commented [X603]: ~~Free with drafting note. Edit above~~

Commented [VM22604R603]: Subgroup agrees with including the 100% mortality scenario.

Commented [X605]: Recommend deleting guidance note, as it doesn't provide full or clear scope of what may be excluded, so could be misread to either guarantee option for certain products or exclude the option for other products.

Commented [VM22606R605]: No objections to removing the guidance note.

Section 8: To Be Determined (Scenario Generation for VM-21)

Section 9: Modeling Hedges under a ~~Future Non-Index Credit~~ Future Hedging Strategy

A. Initial Considerations

1. This section applies to modeling of hedges other than situations where the company (a) only hedges index credits. ~~If the company, or (b) clearly separates index credit hedging from other hedging, then only the section only pertains to the other hedging if the index hedging follows. In those situations, the modeling of hedges supporting index credits can be simplified including applying an index credit hedge margin, following the requirements in Section 4.A.4.b.i.~~
2. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the calculation of the ~~stochastic reserve~~SR, determined in accordance with Section 3.D and Section 4.D.
3. The company shall take into account the costs and benefits of hedge positions expected to be held by the company in the future along each scenario. Company management is responsible for developing, documenting, executing and evaluating the investment strategy for future hedge purchases. ~~Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months, including the hedging strategy, used to implement the investment policy~~
4. For this purpose, the investment assets refer to all the assets, including derivatives supporting covered products and guarantees. This also is referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which also is referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. There is no attempt to distinguish what is the hedging portfolio and what is the investment portfolio in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.
5. This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the stochastic cash-flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

B. Modeling Approaches

1. The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two types of methods as described below. Although a hedging strategy normally would be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the ~~stochastic reserve~~SR otherwise calculated. Particular attention should be given to Section 1.B Principle 5 for the modeling of future hedging strategies.
2. The fundamental characteristic of the first type of method, referred to as the “explicit method,” is that hedging positions and their resulting cash flows are included in the stochastic cash-flow model used to determine the scenario reserve, as discussed in Section 3.D, for each scenario.

**Commented [X607]:** Section 4.A.4 (Modeling of Hedges) has some relationship with this section, we request clarification around the applicability of these two areas of hedge guidance.

**Commented [VM22608R607]:** Edits to address this comment will be reflected in next exposure

**Commented [CD609]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22610R609]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD611]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22612R611]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X613]:** We seek clarification of this text: if a company only hedges indices or separates index crediting from other hedges, does this apply, or does it only apply to any other hedging?

**Commented [VM22614R613]:** Edits to address this comment will be reflected in next exposure

**Commented [X615]:** The sentence “Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months.” seems to suggest you would do something other than the actual hedging strategy after [6] months. In this case, what are you assuming for modeling? We suggest clarification of this sentence.

**Commented [VM22616R615]:** Edits to address this comment will be reflected in next exposure

**Commented [CD617]:** is this a typo? should this be "purchases"?

**Commented [VM22618R617]:** Edits to address this comment will be reflected in next exposure

**Commented [X619]:** This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Ins: ... [144]

**Commented [VM22620R619]:** Edits to address this comment will be reflected in next exposure

**Commented [X621]:** Reinstate the original sentence which puts the reflection of hedging into the great: ... [145]

**Commented [VM22622R621]:** Edits to address this comment will be reflected in next exposure

**Commented [X623]:** Agree that the uncertainty associated with new strategies should be handled: ... [146]

**Commented [VM22624R623]:** Edits to address this comment will be reflected in next exposure

3. The fundamental characteristic of the second type of method, referred to as the “implicit method,” is that the effectiveness of the current hedging strategy on future cash flows is evaluated, in part or in whole, outside of the stochastic cash-flow model. There are multiple ways that this type of modeling can be implemented. In this case, the reduction to the ~~stochastic reserve~~SR otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.
4. Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions) on the ~~stochastic reserve~~SR needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. In addition, the reduction to the ~~stochastic reserve~~SR attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company’s ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect ~~or mock tested~~.

**Guidance Note:** No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transform some risks into others, introduce new risks, or have other imperfections. ~~For example, a delta only hedging strategy does not adequately hedge the risks measured by the “Greeks” other than delta.~~

5. A safe harbor approach is permitted for reflection of future hedging strategies supporting the contracts for those companies whose modeled hedge assets comprise only linear instruments not sensitive to implied volatility. For companies with option-based hedge strategies, electing this approach would require representing the option-based portion of the strategy as a delta-rho two-Greek hedge program. The normally modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greeks as the original option portfolio.

C. Calculation of Stochastic ReserveSR (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the future hedging strategies supporting the contracts ~~modeling of hedges~~ (including both currently held and future hedge positions) into the stochastic cash-flow model on a best efforts basis, including all of the factors and assumptions needed to ~~model the hedges~~ execute the future hedging strategies supporting the contracts (e.g., stochastic implied volatility). The determination of CTE70 (best efforts) may utilize either explicit or implicit modeling techniques.
2. The company shall calculate a CTE70 (adjusted) by recalculating the CTE70 assuming the company has ~~no future hedging strategies supporting the contracts~~ strategy except those to hedge interest credits and hedge assets held by the company on the valuation date, therefore following the requirements of Section 4.A.4.a and 4.A.4.b.i.

However, for a company with a future hedging strategy supporting the contracts, existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements may be considered in one of two ways for the CTE70 (adjusted):

**Commented [X625]:** Is delta-only hedging common in VM-22 hedging? Could the example be replaced with something more relevant to VM-22 hedging?

**Commented [VM22626R625]:** Decision to remove this sentence, since the examples is less applicable to VM-22 (makes more sense for VM-21).

**Commented [X627]:** The Hedging DG is currently working on language and we will want to be consistent across VM-20, VM-21, and VM-22.

**Commented [VM22628R627]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD629]:** perhaps better to say “no future hedge purchases...”

**Commented [VM22630R629]:** Edits to address this comment will be reflected in next exposure

- a) Include the asset cash flows from any contractual payments and maturity values in the projection model; or
- b) No hedge positions – in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company’s investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

3. Because most models will include at least some approximations or idealistic assumptions, CTE70 (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the value for the ~~stochastic~~ reserveSR is given by:

$$\text{Stochastic reserveSR} = \text{CTE70 (best efforts)} + E \times \max[0, \text{CTE70 (adjusted)} - \text{CTE70 (best efforts)}]$$

4. The company shall specify a value for *E* (the “error factor”) in the range from 5% to 100% to reflect the company’s view of the potential error resulting from the level of sophistication of the stochastic cash-flow model and its ability to properly reflect the parameters of the hedging strategy (i.e., the Greeks being covered by the strategy), as well as the associated costs, risks and benefits. The greater the ability of the stochastic model to capture all risks and uncertainties, the lower the value of *E*. The value of *E* may be as low as 5% only if the model used to determine the CTE70 (best efforts) effectively reflects all of the parameters used in the hedging strategy. If certain economic risks are not hedged, yet the model does not generate scenarios that sufficiently capture those risks, *E* must be in the higher end of the range, reflecting the greater likelihood of error. Likewise, simplistic hedge cash-flow models shall assume a higher likelihood of error.

5. The company shall conduct a formal back-test, based on an analysis of ~~at least the most recent~~ available relevant period of data (but no less than 12 months), to assess how well the model is able to replicate the hedging strategy in a way that supports the determination of the value used for *E*.

6. Such a back-test shall involve one of the following analyses:

- a. For companies that model hedge cash flows directly (“explicit method”), replace the stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario that represents the market path that actually manifested over the selected back-testing period and compare the projected hedge asset gains and losses against the actual hedge asset gains and losses – both realized and unrealized – observed over the same time period. For this calculation, the model assumptions may be replaced with parameters that reflect actual experience during the back-testing period. In order to isolate the comparison between the modeled hedge results and actual hedge results for this calculation, the projected liabilities should accurately reflect the actual liabilities throughout the back-testing period; therefore, adjustments that facilitate this accuracy (e.g. reflecting actual experience instead of model assumptions, including new business, etc.) are permissible.

**Commented [X631]:** We have been getting weak E factor support, with minimum backtesting due to the current phrasing.

**Commented [X632R631]:** Recommend adding stress testing language similar to [Section 4.A.4.b.i.c](#) but with edits based on TDI’s comments/suggestions to [Section 4.A.4.b.i.c](#).

**Commented [VM22633R631]:** Edits to address this comment will be reflected in next exposure

**Commented [X634]:** Recommend adding reporting requirement to VM-31 to disclose if company has switched between explicit method and implicit method, discuss rationale of the change and the change impact.

**Commented [VM22635R634]:** Edits to address this comment will be reflected in next exposure

To support the choice of a low value of E, the company should ascertain that the projected hedge asset gains and losses are within close range of 100% (e.g., 80–125%) of the actual hedge asset gains and losses. The company may also support the choice of a low value of E by achieving a high R-squared (e.g., 0.80 or higher) when using a regression analysis technique.

- b. For companies that model hedge cash flows implicitly by quantifying the cost and benefit of hedging using the fair value of the hedged item (an “implicit method” or “cost of reinsurance method”), calculate the delta, rho and vega coverage ratios in each month over the selected back-testing period in the following manner:
    - i. Determine the hedge asset gains and losses—both realized and unrealized—incurred over the month attributable to equity, interest rate, and implied volatility movements.
    - ii. Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements. The hedged item should be defined in a manner that reflects the proportion of risks hedged (e.g., if a company elects to hedge 50% of a contract’s market risks, it should quantify the fair value of the hedged item as 50% of the fair value of the contract).
    - iii. Calculate the delta coverage ratio as the ratio between (i) and (ii) attributable to equity movements.
    - iv. Calculate the rho coverage ratio as the ratio between (i) and (ii) attributable to interest rate movements.
    - v. Calculate the vega coverage ratio as the ratio between (i) and (ii) attributable to implied volatility movements.
    - vi. To support the company’s choice of a low value of E, the company should be able to demonstrate that the delta and rho coverage ratios are both within close range of 100 % (e.g., 80–125%) consistently across the back-testing period.
    - vii. In addition, the company should be able to demonstrate that the vega coverage ratio is within close range of 100 % in order to use the prevailing implied volatility levels as of the valuation date in quantifying the fair value of the hedged item for the purpose of calculating CTE70 (best efforts). Otherwise, the company shall quantify the fair value of the hedged item for the purpose of calculating CTE70 (best efforts) in a manner consistent with the realized volatility of the scenarios captured in the CTE (best efforts).
  - c. Companies that do not model hedge cash flows explicitly, but that also do not use the implicit method as outlined in Section 9.C.6.b above, shall conduct the formal back-test in a manner that allows the company to clearly illustrate the appropriateness of the selected method for reflecting the cost and benefit of hedging, as well as the value used for E.
7. A company that does not have 12 months of experience to date shall set E to a value that reflects the amount of experience available, and the degree and nature of any change to the hedge program. For a material change in strategy, with ~~no less than 126 months of~~ experience and without robust mock testing history, E should be at least 1.50. For a



material change in strategy, with no less than 3 months of history, E should be 1.0. However, when a material change in hedging strategy with less than 3 months history is the introduction of hedging for a newly introduced product or newly acquired block of business and is supplemented by robust mock testing, E should instead be at least 0.3. Moreover, with prior approval from the domestic regulator, material changes in hedge strategy with less than 3 months history but with robust mock testing may have error factors less than 1.0, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for additional uncertainty in anticipated hedging experience beyond that of a robust hedging program already in existence. However, E may be lower than 1.0-50 if ~~some~~ at least 6 months of reliable experience is available and/or if the change in strategy is a minor refinement rather than a ~~substantial~~ material change in strategy, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for any additional uncertainty associated with the refinement.

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily large (e.g.,  $\geq 5100\%$ ) for substantial changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy) ~~without robust mock-testing where the company has not been able to provide a meaningful simulation of hedge performance based on the new strategy.~~
- An increase in the error factor may not always be needed for minor refinements to the hedge strategy (e.g., moving from swaps to Treasury futures).
- A temporary moderate increase (e.g., 15–30%) in error factor should be used for ~~substantial modifications to hedge programs or modeling where meaningful simulation has not been created (e.g., adding second order hedging, such as gamma or rate convexity).~~
- No increase in the error factor may be used for incremental modifications to the hedge strategy (e.g., adding death benefits to a program that previously covered only living benefits, or moving from swaps to Treasury Department futures).

8. The company shall set the value of E reflecting the extent to which the future hedging program is clearly defined. To support a value of E below 1.0, there should be very robust documentation outlining the future hedging strategies program. To the extent that documentation outlining any of the future hedging strategies program is incomplete, the value of E shall be increased. In particular, the value of E shall be 1.0 if documentation is materially incomplete for any of the individual CDHS attributes (a) through (j), as listed in VM-01.

Any increases required to the value of E to reflect that documentation is not available to support that the future hedging strategies program are clearly defined shall be in addition to increases to the value of E to reflect a lack of historical experience or to reflect the backtesting results, subject to an overall ceiling of 1.0 for E.

**Guidance Note:** Companies must use judgment both in determining an E factor and in applying this requirement in the case where there are multiple future hedging strategies, particularly where some may be CDHS and some may not be CDHS. In this case, the SR should be ensured to be no less than the CTE(70) reflecting the future hedging strategies

**Commented [X636]:** 6 month restriction should be handled in the error factor. Other language for clarity. Edited guidance note below to be consistent with this.

**Commented [VM22637R636]:** Edits to create consistency with recently adopted APF 2020-12 will be considered for the next exposure

**Commented [X638]:** Work is being done by the hedging DG. This is a placeholder. Need to reflect how clearly defined and well documented the hedge program is, to be able to rely on the backtesting provided. To the extent that hedge programs are not clearly defined, E should be increased to reflect that the backtesting cannot be relied on as an indicator of future effectiveness.

**Commented [VM22639R638]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

that are CDHS and not reflecting those that are not CDHS. Companies with multiple future hedging strategies with very different levels of effectiveness or with multiple future hedging strategies that include both CDHS and non-CDHS should discuss with their domestic regulator.

E. Additional Considerations for CTE70 (best efforts)

If the company is following one or more future hedging strategies supporting the contracts-a CDHS, the fair value of the portfolio of contracts falling within the scope of these requirements shall be computed and compared to the CTE70 (best efforts) and CTE70 (adjusted). If the CTE70 (best efforts) is below both the fair value and CTE70 (adjusted), the company should be prepared to explain why that result is reasonable.

For the purposes of this analysis, the SR and fair value calculations shall be done without requiring the scenario reserve for any given scenario to be equal to or in excess of the cash surrender value in aggregate for the group of contracts modeled in the projection.

D. Specific Considerations and Requirements

1. As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the ~~stochastic reserve~~ SR, the company should review actual historical hedging effectiveness. The company shall evaluate the appropriateness of the assumptions on future trading, transaction costs, other elements of the model, the strategy, the mix of business and other items that are likely to result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, are likely to result in adverse results relative to those modeled. The parameters and assumptions shall be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model shall be modified to reflect them at either anticipated experience or adverse estimates of the parameters.

2. A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with the guaranteed contract holder options embedded in the ~~non-variable fixed indexed annuities and other in-scope products~~ and these same sensitivities associated with the hedging assets are subject to material discontinuities. This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the ~~non-variable fixed indexed annuity and other in-scope products~~ account balances reach a predetermined level in relationship to the guarantees. Any hedging strategy, ~~including a delta hedging strategy,~~ can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed contract holder options embedded in the ~~non-variable fixed indexed annuities and other in-scope products~~ and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the ~~stochastic reserve~~ SR, the company must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

**Commented [X640]:** Reinstated this disclosure item, which is a rough reasonability check for regulator review/information on the modeled hedge benefit and call prompt further discussion

**Commented [VM22641R640]:** Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

**Commented [CD642]:** Not sure why this section is being deleted. Perhaps references to CDHS could be deleted, but otherwise this section still seems applicable

**Commented [VM22643R642]:** Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

**Commented [X644]:** Suggest replacing "indexed" with "fixed" since this would apply to all fixed annuities.

**Commented [VM22645R644]:** Edits to address this comment will be reflected in next exposure, except that "fixed annuities" will now be referred to as "non-variable annuities" per a decision made by the VM-22 Subgroup.

**Commented [X646]:** Editorial change of "variable fixed indexed annuity" to be "fixed indexed annuity and other in-scope products"

**Commented [VM22647R646]:** Did not include "variable fixed indexed annuities" since the latest draft now excludes index-linked variable annuities to be scoped out of VM-22.

**Commented [X648]:** Recommend deleting "including a delta hedging strategy" as it is already covered by "any hedging strategy" and it is not clear if delta hedging strategy is the most common strategy in VM-22 hedging to be used as a general example.

**Commented [VM22649R648]:** Edits to address this comment will be reflected in next exposure

3. A strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.
4. The combination of elements of the stochastic cash-flow model—including the initial actual market asset prices, prices for trading at future dates, transaction costs and other assumptions—should be analyzed by the company as to whether the stochastic cash-flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:
  - a. Hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money.
  - b. Hedging strategies that, with a given amount of initial money, never make less than accumulation at the one-period risk-free rates in any scenario but make more than this in one or more scenarios.
5. If the stochastic cash-flow model allows for such situations, the company should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the ~~stochastic reserve~~ SR otherwise calculated.
6. In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.
7. The company may also consider historical experience for similar current or past hedging programs on similar products to support the error factor determined for the projection.

## Section 10: Guidance and Requirements for Setting Contract Holder Behavior Prudent Estimate Assumptions

### A. General

Contract holder behavior assumptions encompass actions such as lapses, withdrawals, transfers, recurring deposits, benefit utilization, option election, etc. Contract holder behavior is difficult to predict accurately, and variance in behavior assumptions can significantly affect the ~~results~~ reserves level. In the absence of relevant and fully credible empirical data, the company should set behavior assumptions as guided by Principle 3 in Section 1.B and Section 12.

In setting behavior assumptions, the company should examine, but not be limited by, the following considerations:

1. Behavior can vary by product, market, distribution channel, index performance, interest credited (current and guaranteed rates), time/product duration, etc.
2. Options embedded in the product may affect behavior.
3. Utilization of options may be elective or non-elective in nature. Living benefits often are elective, and death benefit options are generally non-elective.
4. Elective contract holder options may be more driven by economic conditions than non-elective options.
5. As the value of a product option increases, there is an increased likelihood that contract holders will behave in a manner that maximizes their financial interest (e.g., lower lapses, higher benefit utilization, etc.).
6. Behavior formulas may have both rational and irrational components (irrational behavior is defined as situations where some contract holders may not always act in their best financial interest). The rational component should be dynamic, but the concept of rationality need not be interpreted in strict financial terms and might change over time in response to observed trends in contract holder behavior based on increased or decreased financial efficiency in exercising their contractual options.
7. ~~Options~~ that are ancillary to the primary product features ~~may or may not~~ be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many ~~thing~~ considerations, such as:
  - a. ~~For what~~ The purpose for which was the product purchased.<sup>2</sup>
  - b. ~~Is~~ Whether the ~~is~~ option elective or non-elective.<sup>2</sup>
  - c. ~~Whether~~ Is the value of the option is well-known.<sup>2</sup>
8. ~~External influences may affect behavior.~~

### B. Aggregate vs. Individual Margins

1. Prudent estimate assumptions are developed by applying a margin for uncertainty to the anticipated experience assumption. The issue of whether the level of the margin applied to the anticipated experience assumption is determined in aggregate or independently for each and every behavior assumption is discussed in Principle 3 in Section 1.B.

Commented [X650]: Editorial clarification

Commented [VM22651R650]: Edits to address this comment will be reflected in next exposure

Commented [X652]: Need general assumption setting section, see APF 2021-11.

Commented [VM22653R652]: Edits to address this comment will be reflected in next exposure

Commented [X654]: We would suggest rewording this section to be considerations rather than posed as questions.

Commented [VM22655R654]: Edits to address this comment will be reflected in next exposure

Commented [X656]: Editorial clarification

Commented [VM22657R656]: Edits to address this comment will be reflected in next exposure

Commented [X658]: Recommend adding some examples here if this is included.

Commented [VM22659R658]: Edits to address this comment will be reflected in next exposure

2. Although this principle discusses the concept of determining the level of margins in aggregate, it notes that the application of this concept shall be guided by evolving practice and expanding knowledge. From a practical standpoint, it may not always be possible to completely apply this concept to determine the level of margins in aggregate for all behavior assumptions.
3. Therefore, the company shall determine prudent estimate assumptions independently for each behavior (e.g., mortality, lapses and benefit utilization), using the requirements and guidance in this section and throughout these requirements, unless the company can demonstrate that an appropriate method was used to determine the level of margin in aggregate for two or more material behavior assumptions, if relevant to the risks in the product, and thus the approach will not understate the reserve.

C. Sensitivity Testing

The impact of behavior can vary by product, time period, etc. For any assumption that is not prescribed or stochastically modeled, the company/qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing to ensure that the assumption is set at the conservative end of the plausible range. The company shall sensitivity test:

- Surrenders.
- Partial withdrawals.
- Benefit utilization.
- Account transfers.
- Future deposits.
- Other behavior assumptions if relevant to the risks in the product.

Sensitivity testing of assumptions is required and shall be more complex than, for example, base lapse assumption plus or minus X% across all contracts. A more appropriate sensitivity test in this example might be to devise parameters in a dynamic lapse formula to reflect more out-of-the-money contracts lapsing and/or more holders of in-the-money contracts persisting and eventually using the guarantee. The company should apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the company shall use higher margins when the underlying experience is less than fully relevant and credible.

The company shall examine the results of sensitivity testing to understand the materiality of prudent estimate assumptions on the modeled reserve. The company shall update the sensitivity tests periodically as appropriate, considering the materiality of the results of the tests. The company may update the tests less frequently (but no less than every 3 years) when the tests show less sensitivity of the modeled reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company may perform sensitivity testing:

1. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.

Commented [X660]: Clarification

Commented [VM22661R660]: Edits to address this comment will be reflected in next exposure

Commented [X662]: Suggest updating bullet to "Other material behavior assumptions if relevant to the risks in the product."

Commented [VM22663R662]: Edits to address this comment will be reflected in next exposure

Commented [X664]: Sensitivity testing is covered by the submitted APF 2021-11 for VM-21, and we should be consistent. VM-21 is currently lacking on sensitivity testing

Commented [VM22665R664]: Make edits to be consistent with VM-21 APFs prior to adoption of VM-22

Commented [VM22666R664]: Edits to address this comment will be reflected in next exposure

Commented [CD667]: why assign this specifically to the QA rather than leaving it as the responsibility of "the company", like we do elsewhere in the requirements?

Commented [VM22668R667]: Edits to address this comment will be reflected in next exposure

Commented [X669]: include for completion

Commented [VM22670R669]: Edits to address this comment will be reflected in next exposure

Commented [X671]: Consistent with APF 2021-11.

Commented [VM22672R671]: Edits to address this comment will be reflected in next exposure

2. Using data from prior periods.

D. Specific Considerations and Requirements

1. Within materiality considerations, the company should consider all relevant forms of contract holder behavior and persistency, including, but not limited to, the following:
  - a. Mortality (additional guidance and requirements regarding mortality is contained in Section 11).
  - b. Surrenders.
  - c. Partial withdrawals (systematic and elective).
  - d. Account transfers (switching/exchanges).
  - e. Resets/ratchets of the guaranteed amounts (automatic and elective).
  - f. Future deposits.
  - g. Income start date for the benefit utilization.
  - h. Commutation of benefit (from periodic payment to lump sum) or vice versa.

2. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the calculated provisions.

For example:

- a. The impact of account transfers (intra-contract index “switching”) might be ignored, unless required under the terms of the contract (e.g., automatic ~~asset~~ re-allocation/rebalancing, ) or if the contract provisions incentivize the contract holders to transfer between accounts.
- b. Future deposits might be excluded from the model, unless required by the terms of the contracts under consideration and then only in such cases where future premiums can reasonably be anticipated (e.g., with respect to timing and amount).
- c. For some non-elective benefits (nursing home benefits for example), a zero incidence rate after the surrender charge has ended, or the cash value has depleted, may be acceptable since use of a non-zero rate could reduce the modeled reserve.

~~Guidance Note: For some non elective benefits (nursing home benefits for example), unless relevant company experience exists to the contrary, the use of incidence rates greater than zero after the surrender charge has ended, or the cash value was depleted might be inappropriate may not be prudent since it would reduce the modeled reserve.~~

3. However, the company should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to test the impact of a shifting asset mix and/or consider future deposits to the extent they can reasonably be anticipated and increase the calculated amounts.

Commented [X673]: Clarification

Commented [VM22674R673]: Edits to address this comment will be reflected in next exposure

Commented [X675]: clarification

Commented [VM22676R675]: Edits to address this comment will be reflected in next exposure

Commented [CD677]: delete this word

Commented [VM22678R677]: Edits to address this comment will be reflected in next exposure

Commented [X679]: Reviewing, this guidance note does not exist in the 2019, 2020, 2021, or 2022 versions of VM-21. Where is this from? Should this be added to VM-21?

Commented [VM22680R679]: Decided to remove the guidance note and keep paragraph c above, which rephrases the guidance note language (stems from AG 33).

4. Normally, the underlying model assumptions would differ according to the attributes of the contract being valued. This would typically mean that contract holder behavior and persistency may be expected to vary according to such characteristics as (this is not an exhaustive list):
  - a. Gender.
  - b. Attained age.
  - c. Issue age.
  - d. Contract duration.
  - e. Time to maturity.
  - f. Tax status.
  - g. Account value.
  - h. Interest credited (current and guaranteed).
  - i. Available indices.
  - j. Guaranteed benefit amounts.
  - k. Surrender charges, transaction fees or other contract charges.
  - l. Distribution channel.
5. Unless there is clear evidence to the contrary, behavior assumptions should be no less conservative than past experience. Margins for contract holder behavior assumptions shall assume, without relevant and credible experience or clear evidence to the contrary, that contract holders' efficiency will increase over time.
6. In determining contract holder behavior assumptions, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience), whether or not the segment is directly written by the company. If data from a similar business segment are used, the assumption shall be adjusted to reflect differences between the two segments. Margins shall reflect the data uncertainty associated with using data from a similar but not identical business segment.
7. Where relevant and fully credible empirical data do not exist for a given contract holder behavior assumption, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is shifted towards the conservative end of the plausible range of expected experience that serves to increase the stochastic reserve. SR. If there are no relevant data, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is at the conservative end of the range. Such adjustments shall be consistent with the definition of prudent estimate, with the principles described in Section 1.B, and with the guidance and requirements in this section.
8. Ideally, contract holder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. It is important to note, however, that contract holder behavior should neither assume that all contract holders act with 100%

**Commented [X681]:** This also applies to VM-21, as there are fixed accounts. Is there any reason not to be consistent?

**Commented [VM22682R681]:** Only to focus on VM-22 for now

**Commented [X683]:** This is not a synonym (perhaps transfer fees is a subset of transaction fees) - why would transaction fees apply for VM-21, but only transfer fees for VM-22?

**Commented [VM22684R683]:** Edits to address this comment will be reflected in next exposure

**Commented [X685]:** This section states that "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally." This text seems to directly contradict Section II. Reserve Requirements 6.H.2 which states "When advantageous, policyholders will commence living benefit payouts if not started yet.". We suggest revising 6.H.2 to align with the text of 10.D.8.

**Commented [VM22686R685]:** Will discuss keeping this text consistent with VM-21, and retaining the language in 10.D.5 above that states efficiency will increase over time.

efficiency in a financially rational manner nor assume that contract holders will always act irrationally. These extreme assumptions may be used for modeling efficiency if the result is more conservative.

E. Dynamic Assumptions

1. Consistent with the concept of prudent estimate assumptions described earlier, the liability model should incorporate margins for uncertainty for all risk factors that are not dynamic (i.e., the non-scenario tested assumptions) and are assumed not to vary according to the financial interest of the contract holder stochastically modeled.
2. The company should exercise care in using static assumptions when it would be more natural and reasonable appropriate to use a dynamic model or other scenario-dependent formulation for behavior. With due regard to considerations of materiality and practicality allowance for appropriate simplifications, approximations and modeling efficiency techniques, the use of dynamic models is encouraged, but not mandatory. Static assumptions Risk factors that are not scenario tested but could reasonably be expected to vary according to a stochastic process, or future states of the world (especially in response to economic drivers), may require higher margins and/or signal a need for higher margins for certain other assumptions.
3. Risk factors that are modeled dynamically should encompass the plausible range of behavior consistent with the economic scenarios and other variables in the model, including the non-scenario tested assumptions. The company shall test the sensitivity of results to understand the materiality of making alternate assumptions and follow the guidance discussed above on setting assumptions for sensitive behaviors.

F. Consistency with the CTE Level

1. All behaviors (i.e., dynamic, formulaic and non-scenario tested) should be consistent with the scenarios used in the CTE calculations (generally, the top 30% of the loss distribution). To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the company should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use prudent estimate assumptions for behavior that are reasonable and appropriate in such scenarios. For non-variable fixed annuities, these "valuation" scenarios would typically display one or more of the following attributes:
  - a. Declining, increasing and/or volatile index values, where applicable.
  - b. Price gaps and/or liquidity constraints.
  - c. Rapidly changing Volatile interest rates or persistently low interest rates.
  - d. Volatile credit spreads.
2. The behavior assumptions should be logical and consistent both individually and in aggregate, especially in the scenarios that govern the results. In other words, the company should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:

Commented [X687]: Recommend replacing "dynamic" with "stochastic." Risk factors with dynamic assumptions still need margins (although for an assumption that was part fixed and part dynamic, only one piece may have the margin but still the risk factor would have a margin).

Commented [VM22688R687]: Edits to address this comment will be reflected in next exposure

Commented [X689]: Suggest replacing "Risk factors that are not scenario tested but" with "Static assumptions that" to improve clarity in the wording.

Commented [VM22690R689]: Edits to address this comment will be reflected in next exposure

Commented [X691]: Get rid of some of the vague adjectives and be consistent with VM framework for simplifications.

Commented [VM22692R691]: Edits to address this comment will be reflected in next exposure

Commented [CD693]: "non-variable"?

Commented [VM22694R693]: Edits to address this comment will be reflected in next exposure

Commented [X695]: Editorial clarification to cover scenarios for all products/guarantees in scope

Commented [VM22696R695]: Edits to address this comment will be reflected in next exposure

Commented [X697]: Editorial for consistency with (a) above

Commented [VM22698R697]: Edits to address this comment will be reflected in next exposure

Commented [X699]: Suggesting deleting as we are not aware of dynamic credit spreads typically being modeled.

Commented [VM22700R699]: Edits to address this comment will be reflected in next exposure



- a. Remain logically and internally consistent across the scenarios tested.
  - b. Represent plausible outcomes.
  - c. Lead to appropriate, but not excessive, asset requirements.
4. The company should remember that the continuum of “plausibility” should not be confined or constrained to the outcomes and events exhibited by historic experience.
5. Companies should attempt to track experience for all assumptions that materially affect their risk profiles by collecting and maintaining the data required to conduct credible and meaningful studies of contract holder behavior.
- G. Additional Considerations and Requirements for Assumptions Applicable to Guaranteed Living Benefits

Experience for contracts without guaranteed living benefits may be of limited use in setting a lapse assumption for contracts with in-the-money or at-the-money guaranteed living benefits. Such experience may only be used if it is appropriate (e.g., lapse experience on contracts without a living benefit may have relevance to the early durations of contracts with living benefits) and relevant to the business.

H. Policy Loans

If policy loans are applicable for the block of business, the company shall determine cash flows for each projection interval for policy loan assets by modeling existing loan balances either explicitly or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

1. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution:
  - a. Produces reserves that are no less than those that would be produced by modeling existing loan balances explicitly.
  - b. Complies with the contract holder behavior requirements stated in Section 10.A to Section 10.G above in this section.
2. If the company models policy loans explicitly, the company shall:
  - a. Treat policy loan activity as an aspect of contract holder behavior and subject to the requirements above in this section.
  - b. Assign loan balances either to exactly match each policy's contract's utilization or to reflect average utilization over a model segment or sub-segments if the results are materially similar.
  - c. Model policy loan interest in a manner consistent with policy contract provisions and with the scenario. Include interest paid in cash as a positive policy loan cash flow in that projection interval, but do not include interest added to the loan balance as a policy loan cash flow. (The increased balance will require increased repayment cash flows in future projection intervals.)

**Commented [CD701]:** Okay to keep the term "Policy Loans"

**Commented [VM22702R701]:** Edits to address this comment will be reflected in next exposure

**Commented [X703]:** Clarify reference to be more specific

**Commented [VM22704R703]:** Edits to address this comment will be reflected in next exposure

**Commented [X705]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22706R705]:** Edits to address this comment will be reflected in next exposure

**Commented [CD707]:** "contract's"

**Commented [VM22708R707]:** Edits to address this comment will be reflected in next exposure

**Commented [X709]:** We have concern that reflecting average utilization may have material impact on benefit projections. Recommend adding "if the results are materially similar". This change is also applied to VM-20 and added to VM-21.

**Commented [VM22710R709]:** Edits to address this comment will be reflected in next exposure

**Commented [X711]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22712R711]:** Edits to address this comment will be reflected in next exposure

**Commented [CD713]:** "contract"

**Commented [VM22714R713]:** Edits to address this comment will be reflected in next exposure

- d. Model policy loan principal repayments, including those that occur automatically upon death or surrender. Include policy loan principal repayments as a positive policy loan cash flow, per Section 4.A.1.h.
- e. Model ~~additional~~ policy loan principal. Include additional policy loan principal as a negative policy loan cash flow, per Section 4.A.1.h (but do not include interest added to the loan balance as a negative policy loan cash flow).
- f. Model any investment expenses allocated to policy loans and include them either with negative policy loan cash flows or insurance expense cash flows.

I. Non-Guaranteed Elements

Consistent with the definition in VM-01, Non-Guaranteed Elements (NGEs) are elements within a contract that affect ~~policy contract~~ costs or values and are not guaranteed or not determined at issue. NGEs consist of elements affecting contract holder costs or values that are both established and subject to change at the discretion of the insurer.

Examples of NGEs specific to non-variable~~fixed~~ annuities include but are not limited to the following: ~~fixed~~ the credited rates on fixed accounts, index parameters (caps, spreads, participation rates, etc.), rider fees, rider benefit features being subject to change (rollup rates, rollup period, etc.), account value charges, and dividends under participating policies or contracts.

1. Except as noted below in Section ~~10.4.5~~, the company shall include NGE in the models to project future cash flows beyond the time the company has authorized their payment or crediting.
2. The projected NGE shall reflect factors that include, but are not limited to, the following (not all of these factors will necessarily be present in all situations):
  - a. The nature of contractual guarantees.
  - b. The company's past NGE practices and established NGE policies.
  - c. The timing of any change in NGE relative to the date of recognition of a change in experience.
  - d. The benefits and risks to the company of continuing to authorize NGE.
3. Projected NGE shall be established based on projected experience consistent with how actual NGE are determined.
4. Projected levels of NGE in the cash-flow model must be consistent with the experience assumptions used in each scenario. Contract holder behavior assumptions in the model must be consistent with the NGE assumed in the model.
5. The company may exclude any portion of an NGE that:
  - a. Is not based on some aspect of the ~~policy's or~~ contract's experience.
  - b. Is authorized by the board of directors and documented in the board minutes, where the documentation includes the amount of the NGE that arises from other sources.

However, if the board has guaranteed a portion of the NGE into the future, the company must model that amount. In other words, the company cannot exclude

**Commented [CD715]:** The wording of "additional" is unclear. Does this mean maintaining a certain level of policy loan utilization throughout the projection (i.e., adding principal as repayments are made), or actually increasing policy loan utilization (i.e., adding more principal) over time? The former would seem more appropriate than the latter.

**Commented [VM22716R715]:** Edits to address this comment will be reflected in next exposure

**Commented [X717]:** Clarification

**Commented [VM22718R717]:** Edits to address this comment will be reflected in next exposure

**Commented [CD719]:** suggest: "contract holder"

**Commented [VM22720R719]:** Edits to address this comment will be reflected in next exposure

**Commented [X721]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22722R721]:** Edits to address this comment will be reflected in next exposure

**Commented [CD723]:** suggest: "are not"

**Commented [VM22724R723]:** Edits to address this comment will be reflected in next exposure

**Commented [CD725]:** suggest: "non-variable annuities"

**Commented [VM22726R725]:** Edits to address this comment will be reflected in next exposure

**Commented [X727]:** Clarity

**Commented [VM22728R727]:** Edits to address this comment will be reflected in next exposure

**Commented [X729]:** Correct section reference

**Commented [VM22730R729]:** Edits to address this comment will be reflected in next exposure

**Commented [CD731]:** delete "policy's or"

**Commented [VM22732R731]:** Edits to address this comment will be reflected in next exposure

**Commented [X733]:** Why does being authorized mean it can be excluded? This seems backwards. Does this mean it has already transpired?

from its model any NGE that the board has guaranteed for future years, even if it could have otherwise excluded them, based on this subsection.

6. The liability for contract holder dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date is reported separately from the statutory reserve. The contract holder dividends that give rise to this dividend liability as of the valuation date may or may not be included in the cash-flow model at the company's option.
  - a. If the contract holder dividends that give rise to the dividend liability are not included in the cash-flow model, then no adjustment is needed to the resulting ~~aggregate stochastic reserve~~ SR.
  - b. If the contract holder dividends that give rise to the dividend liability are included in the cash-flow model, then the resulting ~~aggregate stochastic reserve~~ SR should be reduced by the amount of the dividend liability.
7. All projected cash flows associated with NGEs shall reflect margins for adverse deviations and estimation error in prudent estimate assumptions.

Commented [CD734]: delete "aggregate"

Commented [VM22735R734]: Edits to address this comment will be reflected in next exposure

Commented [CD736]: delete "aggregate"

Commented [VM22737R736]: Edits to address this comment will be reflected in next exposure

Section 11: Guidance and Requirements for Setting Prudent Estimate Mortality Assumptions

A. Overview

1. Intent

The guidance and requirements in this section apply to setting prudent estimate mortality assumptions when determining the stochastic reserve (SR). The intent is for prudent estimate mortality assumptions to be based on facts, circumstances and appropriate actuarial practice, with only a limited role for unsupported actuarial judgment. (Where more than one approach to appropriate actuarial practice exists, the company should select the practice that the company deems most appropriate under the circumstances.)

2. Description

Prudent estimate mortality assumptions shall be determined by first developing expected mortality curves based on either available experience or published tables. Where necessary, margins shall be applied to the experience to reflect data uncertainty. The expected mortality curves shall then be adjusted based on the credibility of the experience used to determine the expected mortality curve. Section 11.B addresses guidance and requirements for determining expected mortality curves, and Section 11.C addresses guidance and requirements for adjusting the expected mortality curves to determine prudent estimate mortality.

Finally, the credibility-adjusted tables shall be adjusted for mortality improvement (where such adjustment is permitted or required) using the guidance and requirements in Section 11.D.

3. Business Segments

For purposes of setting prudent estimate mortality assumptions, the products falling under the scope of these requirements shall be grouped into business segments with different mortality assumptions. The grouping, at a minimum, should differentiate between payout annuities or deferred annuity contracts that contain GLBs, and deferred annuity contracts with no guaranteed benefits or only GMDBs. Where appropriate, the grouping should also differentiate between segments which are known or expected to contain contract holders with sociodemographic, geographic, or health factors reasonably expected to impact the mortality assumptions for the segment (e.g., annuitants drawn from different countries, geographic areas, industry groups, or impaired lives on individually underwritten contracts such as structured settlements). The grouping should also generally follow the pricing, marketing, management and/or reinsurance programs of the company.

**Guidance Note:** This paragraph contemplates situations where it may be appropriate to differentiate mortality assumptions by segment or even by contract due to varying sociodemographic, geographic, or health factors. Particularly, though not exclusively, in the context of group payout annuity contracts, companies may have credible, contract-specific mortality experience data or relevant pooled data from annuitants drawn from similar industries or geographies that may be used to sub-divide inforce blocks into business segments for purposes of setting prudent estimate mortality assumptions.

For example, a company may sell group PRT contracts both to union plans in the U.S. and to private single-employer plans in another country. While both are "PRT contracts," it would be appropriate to differentiate them for mortality assumption purposes, similar to

**Commented [X738]:** Specific requirements will require further discussion, particularly what if any industry experience is identified for the SPA. Ideally, updated and appropriate assumptions should be used for better alignment and to avoid any false positives flagged as an outlier by the SPA.

**Commented [VM22739R738]:** Will address SPA separately

**Commented [X740]:** Recommend removing reference to actuarial judgment being "unsupported" from VM-21 and VM-22 because actuarial judgment should always be supportable - it is "judgment" not an arbitrary decision.

how payout annuities vs. deferred annuities are distinguished.

**Guidance Note:** Distinct mortality or liability assumptions among different contracts within a group of contracts does not in itself preclude the group of contracts from being aggregated for the purposes of the broader stochastic reserve calculation.

4. Margin for Data Uncertainty

The expected mortality curves that are determined in Section 11.B may need to include a margin for data uncertainty. The margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the provision for uncertainty to mortality. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment.

For purposes of this section, if mortality must be increased (decreased) to provide for uncertainty, the business segment is referred to as a plus (minus) mortality (longevity) segment.

It may be necessary, because of a change in the mortality risk profile of the segment, to reclassify a business segment from a mortality (longevity) plus (minus) segment to a longevity (mortality) minus (plus) segment to the extent compliance with this section requires such a reclassification. For example, a segment could require reclassification depending on whether it is gross or net of reinsurance.

B. Determination of Expected Mortality Curves

1. Experience Data

In determining expected mortality curves, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience). See Section 11.B.2 for additional considerations. Finally, if there is no data, the company shall use the applicable table, as required in Section 11.B.3.

2. Data Other Than Direct Experience

Adjustments shall be applied to the data to reflect differences between the business segments, and margins shall be applied to the adjusted expected mortality curves to reflect the data uncertainty associated with using data from a similar but not identical business segment.

To the extent the mortality of a business segment is reinsured, any mortality charges that are consistent with the company's own pricing and applicable to a substantial portion of the mortality risk also may be a reasonable starting point for the determination of the company's expected mortality curves.

3. Little or No Data Requirements

**Commented [X741]:** Recommend deleting this guidance note since it is unnecessary - there is no such restriction for any of VM-20, VM-21 or VM-22. It would be an absurd level of granular distinction, such that it is not clear you could actually perform the projection, given that assumptions vary by attained age, etc.

**Commented [VM22742R741]:** Edits to address this comment will be reflected in next exposure

**Commented [X743]:** Terming the segments "mortality (longevity) segments" would be easier to understand than "plus (minus) segments".

**Commented [VM22744R743]:** Edits to address this comment will be reflected in next exposure

**Commented [X745]:** It is unclear how to interpretate the statement and how to review it for both VM-21 and VM-22. If a company reinsures GMWMB riders, then does it mean that on a net basis the segment would no longer be considered as minus? So, there would be distinct designations for the pre and post reinsurance runs? Recommend discussing the statement and adding additional language or a guidance note to make it clear.

**Commented [X746]:** Delete period, it is a typo

**Commented [VM22747R746]:** Edits to address this comment will be reflected in next exposure

**Commented [X748]:** Does this need to be edited to be consistent with "little or no" data?

**Commented [VM22749R748]:** Will be updated upon SPA assumption development

- i. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no less than:

[2021 SOA Deferred Annuity Mortality Table] with [Projection Scale G2] for individual deferred annuities that do not contain guaranteed living benefits

$$q_x^{20XX+n} = q_x^{20XX}(1 - G2_x)^n$$

- ii. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no greater than:

- a. [The appropriate percentage ( $F_x$ ) from Table 11.1 applied to the 2012 IAM Basic Mortality Table] with [Projection Scale G2] for individual payout annuity contracts and deferred annuity contracts with guaranteed living benefits

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n * F_x$$

- b. [1983 Table "a"] for structured settlements or other contracts with impaired mortality

- c. [1994 GAR Table] with [Projection Scale AA] for group annuities

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

Table 11.1

Attained Age (x)	$F_x$
<=65	80.0%
66	81.5%
67	83.0%
68	84.5%
69	86.0%
70	87.5%
71	89.0%
72	90.5%
73	92.0%
74	93.5%
75	95.0%
76	96.5%
77	98.0%
78	99.5%
79	101.0%
80	102.5%
81	104.0%

Commented [X750]: Section 11.B.3.i only has one item "a". There is no need to specifically have a single item "a". Recommend delete the notation "a" and have "Section 11.B.3.i" only.

Commented [VM22751R750]: Will be updated upon SPA assumption development

Commented [X752]: For PRT an assumption based on third-party data provider would be better than the industry table to get contract specific mortality assumptions. Is this permitted? The guidance note in A.3 seems to get at this but it's not clear in B.3.i.c whether this is allowed. This is an important distinction as PRT population can vary from those populations the tables are based upon.

Commented [VM22753R752]: Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

Commented [X754]: The 1983 Table "a" and 1994 GAR are used for structured settlements and group annuities, respectively. These tables seem to be out of date. If Standard Projected Amount work develops more granular and up to date tables, should these tables be updated to use consistent tables?

Commented [VM22755R754]: Will be updated upon SPA assumption development

Commented [X756]: The percentage factors ( $F_x$ ) are over 100% from attained age 79 to age 104. Is it appropriate to set the factors above 100% for the older ages with no credibility?

Commented [VM22757R756]: Will be updated upon SPA assumption development

Commented [CD758]: does the  $F_x$  factor need any consideration for FIAs with GLBs?

Commented [VM22759R758]: Will be updated upon SPA assumption development

82	105.5%	
83	107.0%	
84	108.5%	
85	110.0%	
86	110.0%	
87	110.0%	
88	110.0%	
89	110.0%	
90	110.0%	
91	110.0%	
92	110.0%	
93	110.0%	
94	110.0%	
95	110.0%	
96	109.0%	
97	108.0%	
98	107.0%	
99	106.0%	
100	105.0%	
101	104.0%	
102	103.0%	
103	102.0%	
104	101.0%	
>=105	100.0%	

iii. For a business segment with non-U.S. insureds, when little or no experience or information is available on a business segment, an established industry or national mortality table and mortality improvement scale may be used, with approval from the domiciliary commissioner.

4. Additional Considerations Involving Data

The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., direct data discussed in Section 11.B.1 or other than direct data discussed in Section 11.B.2).

a. Underreporting of Deaths

Mortality data shall be examined for possible underreporting of deaths. Adjustments shall be made to the data if there is any evidence of underreporting. Alternatively, exposure by lives or amounts on contracts for which death benefits were in the money may be used to determine expected mortality curves. Underreporting on such exposures should be minimal; however, this reduced subset of data will have less credibility.

b. Experience by Contract Duration

Experience of a plus segment shall be examined to determine if mortality by contract duration increases materially due to selection at issue. In the absence of information, the company shall assume that expected mortality will increase by

**Commented [X760]:** The phrase "When little or no experience or information is available on a business segment" is not included, unlike in (i) and (ii) of the same sub-section. It appears to be the intent that this is the only situation in which this would apply, but it would be helpful to make this explicit.

**Commented [VM22761R760]:** Edits to address this comment will be reflected in next exposure

**Commented [X762]:** Reference to the MI scale missing for international business

**Commented [VM22763R762]:** Edits to address this comment will be reflected in next exposure

contract duration for an appropriate select period. As an alternative, if the company determines that mortality is affected by selection, the company could apply margins to the expected mortality in such a way that the actual mortality modeled does not depend on contract duration.

c. Modification and Relevance of Data

Even for a large company, the quantity of life exposures and deaths are such that a significant amount of smoothing may be required to determine expected mortality curves from mortality experience. Expected mortality curves, when applied to the recent historic exposures (e.g., three to seven years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments.

In determining expected mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine expected mortality curves should be documented.

d. Other Considerations

In determining expected mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

C. Adjustment for Credibility to Determine Prudent Estimate Mortality

1. Adjustment for Credibility

The expected mortality curves determined in Section 11.B shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at prudent estimate mortality. The adjustment for credibility shall result in blending the expected mortality curves including margins for uncertainty with the mortality assumption assumptions described in Section 11.B.3. The approach used to adjust the curves shall suitably account for credibility.

**Guidance Note:** For example, when credibility is zero, an appropriate approach should result in a mortality assumption consistent with 100% of the industry mortality assumption described in Section 11.B.3 table used in the blending.

2. Adjustment of Statutory Valuation Industry Mortality for Improvement

For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be and the industry mortality table for a minus segment must be adjusted for mortality improvement. Such adjustment shall reflect the mortality improvement scale described in Section 11.B.3 from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the expected mortality curves.

3. Credibility Procedure

The credibility procedure used shall:

a. Produce results that are reasonable.

**Commented [X764]:** Both plan and industry data should get weighted for business such as PRT. This text says to blend with prescribed tables, but that might not make sense unless additional experience data was unavailable.

**Commented [VM22765R764]:** Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

**Commented [X766]:** Clarification

**Commented [VM22767R766]:** Edits to address this comment will be reflected in next exposure

**Commented [X768]:** Editorial

**Commented [VM22769R768]:** Edits to address this comment will be reflected in next exposure

**Commented [X770]:** The “statutory valuation” is struck out in the guidance note. Recommend replacing “statutory valuation” with either “reference of Section 11.B.3” or “industry”. Otherwise, it is a vague reference since we have both a company mortality table and an industry mortality table.

**Commented [VM22771R770]:** Edits to address this comment will be reflected in next exposure

**Commented [CD772]:** need to reference “the mortality assumption described in Section 11.B.3” here? Otherwise, the sentence is unclear.

**Commented [VM22773R772]:** Edits to address this comment will be reflected in next exposure

**Commented [X774]:** Mortality improvement should be consistent with the underlying tables used, so we would suggest this being based on available experience subject to appropriate guardrails.

**Commented [X775]:** “Statutory Valuation” was stricken from all the body, but left in this title. Consider replacing with “industry”.

**Commented [VM22776R775]:** Edits to address this comment will be reflected in next exposure

**Commented [CD777]:** for consistency, need to delete this reference to “Statutory Valuation”

**Commented [VM22778R777]:** Edits to address this comment will be reflected in next exposure



- b. Not tend to bias the results in any material way.
  - c. Be practical to implement.
  - d. Give consideration to the need to balance responsiveness and stability.
  - e. Take into account not only the level of aggregate claims but the shape of the mortality curve.
  - f. Contain criteria for full credibility and partial credibility that have a sound statistical basis and be appropriately applied.
4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement

The credibility-adjusted table used for plus segments may be and the credibility adjusted table used for minus segments must be adjusted for mortality improvement using the applicable mortality improvement scale described in Section 11.B.3 from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement beyond the valuation date is discussed in Section 11.D.

D. Future Mortality Improvement

The mortality assumption resulting from the requirements of Section 11.C shall be adjusted for mortality improvements beyond the valuation date if such an adjustment would serve to increase the resulting ~~stochastic reserve~~SR. If such an adjustment would reduce the ~~stochastic reserve~~SR, such assumptions are permitted, but not required. In either case, the assumption must be based on current relevant data with a margin for uncertainty (increasing assumed rates of improvement if that results in a higher reserve or reducing them otherwise).

Section 12: Other Guidance and Requirements for Assumptions

A. Overview

This section provides guidance and requirements in general for setting prudent estimate assumptions when determining either the SR or DR. It also provides specific guidance and requirements for expense assumptions.

B. General Assumption Requirements

1. The company shall use prudent estimate assumptions for risk factors that are not stochastically modeled by applying margins to the anticipated experience assumptions if such risk factors have been categorized as material risks by following Section 1.B Principle 3 and requirements in Section 12.C.
2. The company shall establish the prudent estimate assumptions for risk factors in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.
3. The company shall model the following risk factors stochastically unless the company elects the stochastic modeling exclusion defined in Section 7:
  - a. Interest rate movements (i.e., Treasury interest rate curves).
  - b. Equity performance (e.g., Standard & Poor's 500 index [S&P 500] returns and returns of other equity investments).
4. If the company elects to stochastically model risk factors in addition to the economic scenarios, the requirements in this section for determining prudent estimate assumptions for these risk factors do not apply.

**Guidance Note:** It is expected that companies will not stochastically model risk factors other than the economic scenarios, such as contract holder behavior or mortality, until VM-22 has more specific guidance and requirements available. Companies shall discuss with domiciliary regulators if they wish to stochastically model other risk factors.

5. The company shall use its own experience, if relevant and credible, to establish an anticipated experience assumption for any risk factor. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the anticipated experience assumption, making modifications as needed to reflect the circumstances of the company.
  - a. For risk factors (such as mortality) to which statistical credibility theory may be appropriately applied, the company shall establish anticipated experience assumptions for the risk factor by combining relevant company experience with industry experience data, tables or other applicable data in a manner that is consistent with credibility theory and accepted actuarial practice.

**Commented [X779]:** We believe discussion of allocation of appropriate reserves should be analyzed as part of the field study.

**Commented [VM22780R779]:** The VM-22 Subgroup has no objections to waiting until after the field study to determine the allocation approach.

**Commented [X781]:** Need to add a Section 12 for general guidance on prudent assumption setting and on expenses. For VM-21, APF 2021-11 is currently exposed. Should be consistent with that APF, after any tweaks are made. <https://content.naic.org/sites/default/files/minutes/APF%202021-11%20VM21%20Assumptions%2012%202021.pdf>

**Commented [VM22782R781]:** Subgroup agreed on adding this as a new Section 12.

- b. For risk factors (such as utilization of guaranteed living benefits) that do not lend themselves to the use of statistical credibility theory, and for risk factors (such as some of the lapse assumptions) to which statistical credibility theory can be appropriately applied but cannot currently be applied due to lack of industry data, the company shall establish anticipated experience assumptions in a manner that is consistent with accepted actuarial practice and that reflects any available relevant company experience, any available relevant industry experience, or any other experience data that are available and relevant. Such techniques include:
    - i. Adopting standard assumptions published by professional, industry or regulatory organizations to the extent they reflect any available relevant company experience or reasonable expectations.
    - ii. Applying factors to relevant industry experience tables or other relevant data to reflect any available relevant company experience and differences in expected experience from that underlying the base tables or data due to differences between the risk characteristics of the company experience and the risk characteristics of the experience underlying the base tables or data.
    - iii. Blending any available relevant company experience with any available relevant industry experience and/or other applicable data using weightings established in a manner that is consistent with accepted actuarial practice and that reflects the risk characteristics of the underlying contracts and/or company practices.
  - c. For risk factors that have limited or no experience or other applicable data to draw upon, the assumptions shall be established using sound actuarial judgment and the most relevant data available, if such data exists.
  - d. For any assumption that is set in accordance with the requirements of Section 12.B.5.c, the qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing and disclose the analysis performed to ensure that the assumption is set at the conservative end of the plausible range.
  - e. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of statistical or other testing indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary shall set a new, adequate, anticipated experience assumption for the factor.
6. The company shall sensitivity test risk factors that are not stochastically modeled and examine the impact on the stochastic reserve. The company shall update the sensitivity tests periodically as appropriate. The company may update the tests less frequently, but no less than every 3 years, when the tests show less sensitivity of the stochastic reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company

may perform sensitivity testing:

- a. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
- b. Using data from prior periods.

**Guidance Note:** Sensitivity testing every risk factor on an annual basis is not required. For some risk factors, it may be reasonable, in lieu of sensitivity testing, to employ statistical measures for margins, such as adding one or more standard deviations to the anticipated experience assumption.

7. The company shall vary the prudent estimate assumptions from scenario to scenario within the stochastic reserve calculation in an appropriate manner to reflect the scenario-dependent risks.

#### C. Assumption Margins

The company shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed, subject to the following:

1. The level of margin applied to the anticipated experience assumptions may be determined in aggregate or independently as discussed in Section 1.B Principle 3. It is not permissible to set a margin less toward the conservative end of the spectrum to recognize, in whole or in part, implicit or prescribed margins that are present, or are believed to be present, in other risk factors.

Risks that are stochastically modeled (e.g., interest rates, equity returns) or have prescribed margins or guardrails (e.g., assets, revenue sharing) shall be considered material risks. Other risks generally considered to be material include, but are not limited to, mortality, contract holder behavior, maintenance and overhead expenses, inflation and implied volatility. In some cases, the list of material risks may also include acquisition expenses, partial withdrawals, policy loans, annuitizations, account transfers and deposits, and/or option elections that contain an element of anti-selection.

2. The greater the uncertainty in the anticipated experience assumption, the larger the required margin, with the margin added or subtracted as needed to produce a larger Sr or DR than would otherwise result. For example, the company shall use a larger margin when:

- a. The experience data have less relevance or lower credibility.
- b. The experience data are of lower quality, such as incomplete, internally inconsistent or not current.
- c. There is doubt about the reliability of the anticipated experience assumption, such as, but not limited to, recent changes in circumstances or changes in company policies.
- d. There are constraints in the modeling that limit an effective reflection of the risk factor.

Commented [X783]: Edit for VM-22 vs. VM-21?

Commented [VM22784R783]: Will include this language in the next exposure and will solicit any comments

3. In complying with the sensitivity testing requirements in Section 12.B.6 above, greater analysis and more detailed justification are needed to determine the level of uncertainty when establishing margins for risk factors that produce greater sensitivity on the stochastic reserve.
4. A margin is permitted but not required for assumptions that do not represent material risks.
5. A margin should reflect the magnitude of fluctuations in historical experience of the company for the risk factor, as appropriate.
6. The company shall apply the method used to determine the margin consistently on each valuation date but is permitted to change the method from the prior year if the rationale for the change and the impact on the stochastic reserve is disclosed.

#### D. Expense Assumptions

##### 1. General Prudent Estimate Expense Assumption Requirements

In determining prudent estimate expense assumptions, the company:

- a. May spread certain information technology development costs and other capital expenditures over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles.

**Guidance Note:** Care should be taken with regard to the potential interaction with the inflation assumption below.

- b. Shall assume that the company is a going concern.
- c. Shall choose an appropriate expense basis that properly aligns the actual expense to the assumption. If values are not significant, they may be aggregated into a different base assumption.

**Guidance Note:** For example, death benefit expenses should be modeled with an expense assumption that is per death incurred.

- d. Shall reflect the impact of inflation.
- e. Shall not assume future expense improvements.
- f. Shall not include assumptions for federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) and foreign income taxes.
- g. Shall use assumptions that are consistent with other related assumptions.
- h. Shall use fully allocated expenses.

**Guidance Note:** Expense assumptions should reflect the direct costs associated with the block of contracts being modeled, as well as indirect costs and overhead costs that have been allocated to the modeled contracts.

- i. Shall allocate expenses using an allocation method that is consistent across

company lines of business. Such allocation must be determined in a manner that is within the range of actuarial practice and methodology and consistent with applicable ASOPs. Allocations may not be done for the purpose of decreasing the stochastic reserve.

- j. Shall reflect expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger in the expense assumption only when any future costs associated with achieving the efficiencies are also recognized.

**Guidance Note:** For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past, then there would be no future expenses to reflect in the valuation.

- k. Shall reflect the direct costs associated with the contracts being modeled, as well as an appropriate portion of indirect costs and overhead (i.e., expense assumptions representing fully allocated expenses should be used), including expenses categorized in the annual statement as “taxes, licenses and fees” (Exhibit 3 of the annual statement) in the expense assumption.

- l. Shall include acquisition expenses associated with business in force as of the valuation date and significant non-recurring expenses expected to be incurred after the valuation date in the expense assumption.

- m. For contracts sold under a new policy form or due to entry into a new product line, the company shall use expense factors that are consistent with the expense factors used to determine anticipated experience assumptions for contracts from an existing block of mature contracts taking into account:

- i. Any differences in the expected long-term expense levels between the block of new contacts and the block of mature contracts.

- ii. That all expenses must be fully allocated as required under Section 12.D.1.h above.

## 2. Margins for Prudent Estimate Expense Assumptions

The company shall determine margins for expense assumptions following Section 12.C.

Section 13: Allocation of Aggregate Reserves to the Contract Level

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve. For the purpose of this section, if a contract does not have a cash surrender value, then the cash surrender value is assumed to be zero.

Contracts for which the Deterministic Certification Option is elected in Section 7.E are intended to use the methodology described in this section to allocate aggregate reserves in excess of the cash surrender value to individual contracts.

The contract-level reserve for each contract shall be the sum of the following:

- A. The contract's cash surrender value.

Drafting Note: The American Academy of Actuaries Annuity Reserves and Capital Work Group is including two potential options for allocating the excess portion of the aggregate reserve over cash surrender value: (1) Use the same approach as VM-21 (2) Allocate based on an actuarial present value calculation.

The Work Group did not reach a consensus between these two approaches, so wording for both is included in the text below. The Work Group recommends field testing both approaches and considering the results in determining future decisions.

**Option 1: VM-21 Approach**

- B. An allocated portion of the excess of the aggregate reserve over the aggregate cash surrender value shall be allocated to each contract based on a measure of the risk of that product relative to its cash surrender value in the context of the company's in force contracts (assuming zero cash value for contracts that do not contain such). The allocation shall be made separately for DR and SR. The measure of risk should consider the impact of risk mitigation programs, including hedge programs and reinsurance, that would affect the risk of the product. The specific method of assessing that risk and how it contributes to the company's aggregate reserve shall be defined by the company. The method should provide for an equitable allocation based on risk analysis.

**Commented [X785]:** This method only makes sense if done separately for the DR and SR.

- 1. As an example, consider a company with the results of the following three contracts:

Table 12.1: Sample Allocation of Aggregate Reserve

Contract (i)	1	2	3	Total
Cash Surrender Value, C	28	40	52	120
Risk adjusted measure, R	38	52	50	
Aggregate Reserve				140
Allocation Basis for the excess of the Aggregate Reserve over the Cash Surrender Value $A_i = \text{Max}(R_i - C_i, 0)$	10	12	0	22

Allocation of the excess of the Aggregate Reserve over the Cash Surrender Value $Li = (Ai) \sum Ai * [Aggregate Reserve - \sum Ci]$	9.09	10.91	0.00	20
Contract-level reserve $Ci + Li$	37.09	50.91	52.00	140.00

2. In this example, the Aggregate Reserve exceeds the aggregate Cash Surrender Value by 20. The 20 is allocated proportionally across the three contracts based on the allocation basis of the larger of (i) zero; and (ii) a risk adjusted measure based on reserve principles. Therefore, contracts 1 and 2 receive 45% (9/22) and 55% (11/22), respectively, of the excess Aggregate Reserve. As Contract 3 presents no risk in excess of its cash surrender value, it does not receive an allocation of the excess Aggregate Reserve.

**Option 2: Actuarial Present Value Approach**

B. The excess of the aggregate reserve over the aggregate cash surrender value is allocated to policies based on a calculation of the actuarial present value of projected liability cash flows in excess of the cash surrender value:

1. Discount the liability cash flows at the NAER, pursuant to requirements in Section 4, for the scenario that produces the scenario reserve closest to, but not less than the stochastic reserve  $SR$  defined in Section 3.D.
  - a. Groups of contracts that elect the Deterministic Certification Option defined in Section 7.E shall use the NAER in the single scenario used to calculate the reserve to discount liability cash flows, as well as any cash flows that are scenario dependent.
2. If the actuarial present value is less than the cash surrender value, then the excess actuarial present value to be used for allocating the excess aggregate reserve over the cash value shall be floored at zero.
  - a. If all contracts have an excess actuarial present value that is floored at zero, then use the cash surrender value to allocate any excess aggregate reserve over the aggregate cash surrender value.
3. For projecting future liability cash flows, assume the same liability assumptions that were used to calculate the stochastic reserve  $SR$  defined in Section 3.D.
4. As a hypothetical example, consider a company with the results of the following five contracts:

**Commented [X786]:** This method depends on the NAER, so would not work for companies that use direct iteration.

**Commented [X787]:** This could give an unstable allocation if there is an even mix of products with different risk profiles, so that the tail is populated with some scenarios where Product A does poorly and some where Product B does poorly. The single scenario will only reflect the riskiness of one of the products.

**Commented [X788]:** Not just the NAER, but the cashflows are also scenario dependent.

**Commented [VM22789R788]:** Edits to address this comment will be reflected in next exposure

**Commented [CD790]:** "Section 3.D"

**Commented [VM22791R790]:** Edits to address this comment will be reflected in next exposure



Table 12.1: Hypothetical Sample Allocation of Aggregate Reserve

Contract	Example Product Type	CSV* (1)	Scenario APV (2)	Excess (Floored) of the scenario APV over CSV* (3) = $\text{Max}[(2)-(1), 0]$	Aggregate Reserve CTE 70 (4)	Excess of Aggregate Reserve over Aggregate CSV* (5) = $\text{Max}[(4 \text{ Total}) - (1 \text{ Total}), 0]$	Allocated Excess Reserve (6) = (3) x $[(5 \text{ Total}) / (3 \text{ Total})]$	Total Contract Level Reserve (7) = (1) + (6)
Contract 1:	Indexed Annuity with no GLWB**	95.0	90.0	0.0			0.0	95.0
Contract 2:	Indexed Annuity with low benefit GLWB**	92.0	95.0	3.0			3.6	95.6
Contract 3:	Indexed Annuity with medium benefit GLWB**	90.0	100.0	10.0			12.0	102.0
Contract 4:	Indexed Annuity with high benefit GLWB**	88.0	105.0	17.0			20.4	108.4
Contract 5:	Fixed Life Contingent Payout Annuity	0.0	70.0	70.0			84.0	84.0
Total		365.0		100.0	485.0	120.0	120.0	485.0

\*Cash Surrender Value  
 \*\*Guaranteed Lifetime Withdrawal Benefit

**Guidance Note:** The actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

Commented [CD792]: should be " $\text{Max}[(2)-(1), 0]$ "

Commented [VM22793R792]: Edits to address this comment will be reflected in next exposure

~~Section 13~~ VM-V: Statutory Maximum Valuation Interest Rates for ~~Income Annuity~~  
Formulaic Reserves

1. Income Annuities

A. Purpose and Scope

1. These requirements define for single premium immediate annuity contracts and other similar contracts, certificates and contract features the statutory maximum valuation interest rate that complies with Model #820. These are the maximum interest rate assumption requirements to be used in the CARVM and for certain contracts, the CRVM. These requirements do not preclude the use of a lower valuation interest rate assumption by the company if such assumption produces statutory reserves at least as great as those calculated using the maximum rate defined herein.
2. The following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits arising from variable annuities, ~~are covered in this section, and all contracts not passing the SET covered by Sections 1 through 13 of VM-22, are covered in VM-V~~ ~~Section 14 of VM-22;~~
  - a. Immediate annuity contracts issued after Dec. 31, 2017;
  - b. Deferred income annuity contracts issued after Dec. 31, 2017;
  - c. Structured settlements in payout or deferred status issued after Dec. 31, 2017;
  - d. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued after Dec. 31, 2017;
  - e. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued during 2017, for fixed payouts commencing after Dec. 31, 2018, or, at the option of the company, for fixed payouts commencing after Dec. 31, 2017;
  - f. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest), issued after Dec. 31, 2017;
  - g. Fixed income payment streams, attributable to contingent deferred annuities (CDAs) issued after Dec. 31, 2017, once the underlying contract funds are exhausted;
  - h. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts issued after Dec. 31, 2017, once the contract funds are exhausted; and
  - i. Certificates with premium determination dates after Dec. 31, 2017, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders benefits upon their retirement.

**Guidance Note:** For ~~VM-V~~ Section ~~13~~14.A.2.d, Section ~~13~~14.A.2.e, Section ~~13~~14.A.2.f and Section ~~13~~14.A.2.h above, there is no restriction on the type of contract that may give rise to the benefit.

3. Exemptions:
  - a. With the permission of the domiciliary commissioner, for the categories of annuity

**Commented [X794]:** Under A.2: need to exclude contracts being covered by the earlier sections of VM-22 not passing the exclusion tests and need a clearer reference instead of "covered in this section"

**Commented [VM22795R794]:** Edits to address this comment will be reflected in next exposure

contracts, certificates and/or contract features in scope as outlined in VM-V Section ~~14~~14.A.2.d, Section ~~14~~14.A.2.e, Section ~~14~~14.A.2.f, Section ~~14~~14.A.2.g or Section ~~14~~14.A.2.h, the company may use the same maximum valuation interest rate used to value the payment stream in accordance with the guidance applicable to the host contract. In order to obtain such permission, the company must demonstrate that its investment policy and practices are consistent with this approach.

4. The maximum valuation interest rates for the contracts, certificates and contract features within the scope of VM-V Section ~~14~~14 of VM 22 supersede those described in Appendix VM-A and Appendix VM-C, but they do not otherwise change how those appendices are to be interpreted. In particular, *Actuarial Guideline IX-B—Clarification of Methods Under Standard Valuation Law for Individual Single Premium Immediate Annuities, Any Deferred Payments Associated Therewith, Some Deferred Annuities and Structured Settlements Contracts* (AG-9-B) (see VM-C) provides guidance on valuation interest rates and is, therefore, superseded by these requirements for contracts, certificates and contract features in scope. Likewise, any valuation interest rate references in *Actuarial Guideline IX-C—Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives Under Individual Single Premium Immediate Annuities* (AG-9-C) (see VM-C) are also superseded by these requirements.

#### B. Definitions

1. The term “reference period” means the length of time used in assigning the Valuation Rate Bucket for the purpose of determining the statutory maximum valuation interest rate and is determined as follows:
  - a. For contracts, certificates or contract features with life contingencies and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the earlier of: i) the date of the last non-life-contingent payment under the contract, certificate or contract feature; and ii) the date of the first life-contingent payment under the contract, certificate or contract feature, or
  - b. For contracts, certificates or contract features with no life-contingent payments and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the date of the last non-life-contingent payment under the contract, certificate or contract feature, or
  - c. For contracts, certificates or contract features where the payments are not substantially similar, the actuary should apply prudent judgment and select the Valuation Rate Bucket with Macaulay duration that is a best fit to the Macaulay duration of the payments in question.

**Guidance Note:** Contracts with installment refunds or similar features should consider the length of the installment period calculated from the premium determination date as the non-life contingent period for the purpose of determining the reference period.

**Guidance Note:** The determination in VM-V Section ~~14~~14.B.1.c above shall be made based on the materiality of the payments that are not substantially similar relative to the life-contingent payments.

2. The term “jumbo contract” means a contract with an initial consideration equal to or greater than \$250 million. Considerations for contracts issued by an insurer to the same contract holder within 90 days shall be combined for purposes of determining whether the contracts meet this threshold.

**Guidance Note:** If multiple contracts meet this criterion in aggregate, then each contract is a jumbo contract.

3. The term “non-jumbo contract” means a contract that does not meet the definition of a jumbo contract.
4. The term “premium determination date” means the date as of which the valuation interest rate for the contract, certificate or contract feature being valued is determined.
5. The term “initial age” means the age of the annuitant as of his or her age last birthday relative to the premium determination date. For joint life contracts, certificates or contract features, the “initial age” means the initial age of the younger annuitant. If a contract, certificate or contract feature for an annuitant is being valued on a standard mortality table as an impaired annuitant, “initial age” means the rated age. If a contract, certificate or contract feature is being valued on a substandard mortality basis, “initial age” means an equivalent rated age.
6. The term “Table X spreads” means the prescribed VM-~~V22~~ Section ~~1314~~ current market benchmark spreads for the quarter prior to the premium determination date, as published on the Industry tab of the NAIC website. The process used to determine Table X spreads is the same as that specified in VM-20 Appendix 2.D for Table F, except that JP Morgan and Bank of America bond spreads are averaged over the quarter rather than the last business day of the month.
7. The term “expected default cost” means a vector of annual default costs by weighted average life. This is calculated as a weighted average of the VM-20 Table A prescribed annual default costs published on the Industry tab of the NAIC website in effect for the quarter prior to the premium determination date, using the prescribed portfolio credit quality distribution as weights.
8. The term “expected spread” means a vector of spreads by weighted average life. This is calculated as a weighted average of the Table X spreads, using the prescribed portfolio credit quality distribution as weights.
9. The term “prescribed portfolio credit quality distribution” means the following credit rating distribution:
  - a. 5% Treasuries
  - b. 15% Aa bonds (5% Aa1, 5% Aa2, 5% Aa3)
  - c. 40% A bonds (13.33% A1, 13.33% A2, 13.33% A3)\*
  - d. 40% Baa bonds (13.33% Baa1, 13.33% Baa2, 13.33% Baa3)\*

\*40%/3 is used unrounded in the calculations.

#### C. Determination of the Statutory Maximum Valuation Interest Rate

1. Valuation Rate Buckets
  - a. For the purpose of determining the statutory maximum valuation interest rate, the contract, certificate or contract feature being valued must be assigned to one of four Valuation Rate Buckets labeled A through D.

- b. If the contract, certificate or contract feature has no life contingencies, the Valuation Rate Bucket is assigned based on the length of the reference period (RP), as follows:

**Table 3-1: Assignment to Valuation Rate Bucket by Reference Period Only**

RP ≤ 5 Years	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
A	B	C	D

- c. If the contract, certificate or contract feature has life contingencies, the Valuation Rate Bucket is assigned based on the length of the RP and the initial age of the annuitant, as follows:

**Table 3-2: Assignment to Valuation Rate Bucket by Reference Period and Initial Age**

Initial Age	RP ≤ 5Y	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
90+	A	B	C	D
80–89	B	B	C	D
70–79	C	C	C	D
< 70	D	D	D	D

2. Premium Determination Dates

- a. The following table specifies the decision rules for setting the premium determination date for each of the contracts, certificates and contract features listed in Section 1:

**Table 3-3: Premium Determination Dates**

Section	Item Description	Premium determination date
A.2.a	Immediate annuity	Date consideration is determined and committed to by contract holder
A.2.b	Deferred income annuity	Date consideration is determined and committed to by contract holder
A.2.c	Structured settlements	Date consideration is determined and committed to by contract holder
A.2.d and A.2.e	Fixed payout annuities resulting from settlement options or annuitizations from host contracts	Date consideration for benefit is determined and committed to by contract holder
A.2.f	Supplementary contracts	Date of issue of supplementary contract

A.2.g	Fixed income payment streams from CDAs, AV becomes 0	Date on which AV becomes 0
A.2.h	Fixed income payment streams from guaranteed living benefits, AV becomes 0	Date on which AV becomes 0
A.2.i	Group annuity and related certificates	Date consideration is determined and committed to by contract holder

**Guidance Note:** For the purposes of the items in the table above, the phrase “date consideration is determined and committed to by the contract holder” should be interpreted by the company in a manner that is consistent with its standard practices. For some products, that interpretation may be the issue date or the date the premium is paid.

b. Immaterial Change in Consideration

If the premium determination date is based on the consideration, and if the consideration changes by an immaterial amount (defined as a change in present value of less than 10% and less than \$1 million) subsequent to the original premium determination date, such as due to a data correction, then the original premium determination date shall be retained. In the case of a group annuity contract where a single premium is intended to cover multiple certificates, certificates added to the contract after the premium determination date that do not trigger the company’s right to reprice the contract shall be treated as if they were included in the contract as of the premium determination date.

3. Statutory Maximum Valuation Interest Rate

- a. For a given contract, certificate or contract feature, the statutory maximum valuation interest rate is determined based on its assigned Valuation Rate Bucket (VM-V Section 1314.C.1) and its Premium Determination Date (VM-V Section 1314.C.2) and whether the contract associated with it is a jumbo contract or a non-jumbo contract.
- b. Statutory maximum valuation interest rates for jumbo contracts are determined and published daily by the NAIC on the Industry tab of the NAIC website. For a given premium determination date, the statutory maximum valuation interest rate is the daily statutory maximum valuation interest rate published for that premium determination date.
- c. Statutory maximum valuation interest rates for non-jumbo contracts are determined and published quarterly by the NAIC on the Industry tab of the NAIC website by the third business day of the quarter. For a given premium determination date, the statutory maximum valuation interest rate is the quarterly statutory maximum valuation interest rate published for the quarter in which the premium determination date falls.
- d. Quarterly Valuation Rate:

For each Valuation Rate Bucket, the quarterly valuation rate is defined as follows:

$$I_q = R + S - D - E$$

Where:

- a. R is the reference rate for that Valuation Rate Bucket (defined in VM-V Section 4314.C.4);
  - b. S is the spread rate for that Valuation Rate Bucket (defined in VM-V Section 4314.C.5);
  - c. D is the default cost rate for that Valuation Rate Bucket (defined in VM-V Section 4314.C.6);
- and
- d. E is the spread deduction defined as 0.25%.

e. Daily Valuation Rate:

For each Valuation Rate Bucket, the daily valuation rate is defined as follows:

$$I_d = I_q + C_{d-1} - C_q$$

Where:

- a.  $I_q$  is the quarterly valuation rate for the calendar quarter preceding the business day immediately preceding the premium determination date;
- b.  $C_{d-1}$  is the daily corporate rate (defined in VM-V Section 4314.C.7) for the business day immediately preceding the premium determination date; and
- c.  $C_q$  is the average daily corporate rate (defined in VM-V Section 4314.C.8) corresponding to the same period used to develop  $I_q$ .

For jumbo contracts, the daily statutory maximum valuation interest rate is the daily valuation rate ( $I_d$ ) rounded to the nearest one-hundredth of one percent (1/100 of 1%).

4. Reference Rate

Reference rates are updated quarterly as described below:

- a. The “quarterly Treasury rate” is the average of the daily Treasury rates for a given maturity over the calendar quarter prior to the premium determination date. The quarterly Treasury rate is downloaded from <https://fred.stlouisfed.org>, and is rounded to two decimal places.
- b. Download the quarterly Treasury rates for two-year, five-year, 10-year and 30-year U.S. Treasuries.
- c. The reference rate for each Valuation Rate Bucket is calculated as the weighted average of the quarterly Treasury rates using Table 1 weights (defined in VM-V Section 4314.C.9) effective for the calendar year in which the premium determination date falls.

5. Spread

The spreads for each Valuation Rate Bucket are updated quarterly as described below:

- a. Use the Table X spreads from the NAIC website for WALs two, five, 10 and 30 years only to calculate the expected spread.

- b. Calculate the spread for each Valuation Rate Bucket, which is a weighted average of the expected spreads for WALs two, five, 10 and 30 using Table 2 weights (defined in Section 3.1) effective for the calendar year in which the premium determination date falls.
6. Default costs for each Valuation Rate Bucket are updated annually as described below:
- a. Use the VM-20 prescribed annual default cost table (Table A) in effect for the quarter prior to the premium determination date for WAL two, WAL five and WAL 10 years only to calculate the expected default cost. Table A is updated and published annually on the Industry tab of the NAIC website during the second calendar quarter and is used for premium determination dates starting in the third calendar quarter.
  - b. Calculate the default cost for each Valuation Rate Bucket, which is a weighted average of the expected default costs for WAL two, WAL five and WAL 10, using Table 3 weights (defined in VM-V Section 4314.C.9) effective for the calendar year in which the premium determination date falls.

7. Daily Corporate Rate

Daily corporate rates for each valuation rate bucket are updated daily as described below:

- a. Each day, download the Bank of America Merrill Lynch U.S. corporate effective yields as of the previous business day's close for each index series shown in the sample below from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from the table below\]](https://research.stlouisfed.org/fred2/series/[replace with series name from the table below]).

**Table 3-4: Index Series Names**

Maturity	Series Name
1Y – 3Y	BAMLC1A0C13YEY
3Y – 5Y	BAMLC2A0C35YEY
5Y – 7Y	BAMLC3A0C57YEY
7Y – 10Y	BAMLC4A0C710YEY
10Y – 15Y	BAMLC7A0C1015YEY
15Y+	BAMLC8A0C15PYEY

- b. Calculate the daily corporate rate for each valuation rate bucket, which is a weighted average of the Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in VM-V Section 4314.C.9) effective for the calendar year in which the business date immediately preceding the premium determination date falls.
8. Average Daily Corporate Rate
- Average daily corporate rates are updated quarterly as described below:



- a. Download the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields for each index series shown in Section 3.G.1 from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from VM-V Section 1314.C.7.a\]](https://research.stlouisfed.org/fred2/series/[replace with series name from VM-V Section 1314.C.7.a]).
- b. Calculate the average daily corporate rate for each valuation rate bucket, which is a weighted average of the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in VM-V Section 1314.C.9) for the same calendar year as the weight tables (i.e. Tables 1, 2, and 3) used in calculating  $I_q$  in VM-V Section 1314.C.3.e.

9. Weight Tables 1 through 4

The system for calculating the statutory maximum valuation interest rates relies on a set of four tables of weights that are based on duration and asset/liability cash-flow matching analysis for representative annuities within each valuation rate bucket. A given set of weight tables is applicable to the calculations for every day of the calendar year.

In the fourth quarter of each calendar year, the weights used within each valuation rate bucket for determining the applicable valuation interest rates for the following calendar year will be updated using the process described below. In each of the four tables of weights, the weights in a given row (valuation rate bucket) must add to exactly 100%.

Weight Table 1

The process for determining Table 1 weights is described below:

- a. Each valuation rate bucket has a set of representative annuity forms. These annuity forms are as follows:
  - i. Bucket A:
    - a) Single Life Annuity age 91 with 0 and five-year certain periods.
    - b) Five-year certain only.
  - ii. Bucket B:
    - a) Single Life Annuity age 80 and 85 with 0, five-year and 10-year certain periods.
    - b) 10-year certain only.
  - iii. Bucket C:
    - a) Single Life Annuity age 70 with 0 and 15-year certain periods.
    - b) Single Life Annuity age 75 with 0, 10-year and 15-year certain periods.
    - c) 15-year certain only.
  - iv. Bucket D:

- a) Single Life Annuity age 55, 60 and 65 with 0 and 15-year certain periods.
- b) 25-year certain only.
- b. Annual cash flows are projected assuming annuity payments are made at the end of each year. These cash flows are averaged for each valuation rate bucket across the annuity forms for that bucket using the statutory valuation mortality table in effect for the following calendar year for individual annuities for males (ANB).
- c. The average daily rates in the third quarter for the two-year, five-year, 10-year and 30-year U.S. Treasuries are downloaded from <https://fred.stlouisfed.org> as input to calculate the present values in Step d.
- d. The average cash flows are summed into four time period groups: years 1–3, years 4–7, years 8–15 and years 16–30. (**Note:** The present value of cash flows beyond year 30 are discounted to the end of year 30 and included in the years 16–30 group. This present value is based on the lower of 3% and the 30-year Treasury rate input in Step c.)
- e. The present value of each summed cash-flow group in Step d is then calculated by using the Step 3 U.S. Treasury rates for the midpoint of that group (and using the linearly interpolated U.S. Treasury rate when necessary).
- f. The duration-weighted present value of the cash flows is determined by multiplying the present value of the cash-flow groups by the midpoint of the time period for each applicable group.
- g. Weightings for each cash-flow time period group within a valuation rate bucket are calculated by dividing the duration weighted present value of the cash flow by the sum of the duration weighted present value of cash flow for each valuation rate bucket.

Weight Tables 2 through 4

Weight Tables 2 through 4 are determined using the following process:

- i. Table 2 is identical to Table 1.
- ii. Table 3 is based on the same set of underlying weights as Table 1, but the 10-year and 30-year columns are combined since VM-20 default rates are only published for maturities of up to 10 years.
- iii. Table 4 is derived from Table 1 as follows:
  - a) Column 1 of Table 4 is identical to column 1 of Table 1.
  - b) Column 2 of Table 4 is 50% of column 2 of Table 1.
  - c) Column 3 of Table 4 is identical to column 2 of Table 4.
  - d) Column 4 of Table 4 is 50% of column 3 of Table 1.
  - e) Column 5 of Table 4 is identical to column 4 of Table 4.
  - f) Column 6 of Table 4 is identical to column 4 of Table 1.

10. Group Annuity Contracts

For a group annuity purchased under a retirement or deferred compensation plan (VM-V Section 1314.A.2.i), the following apply:

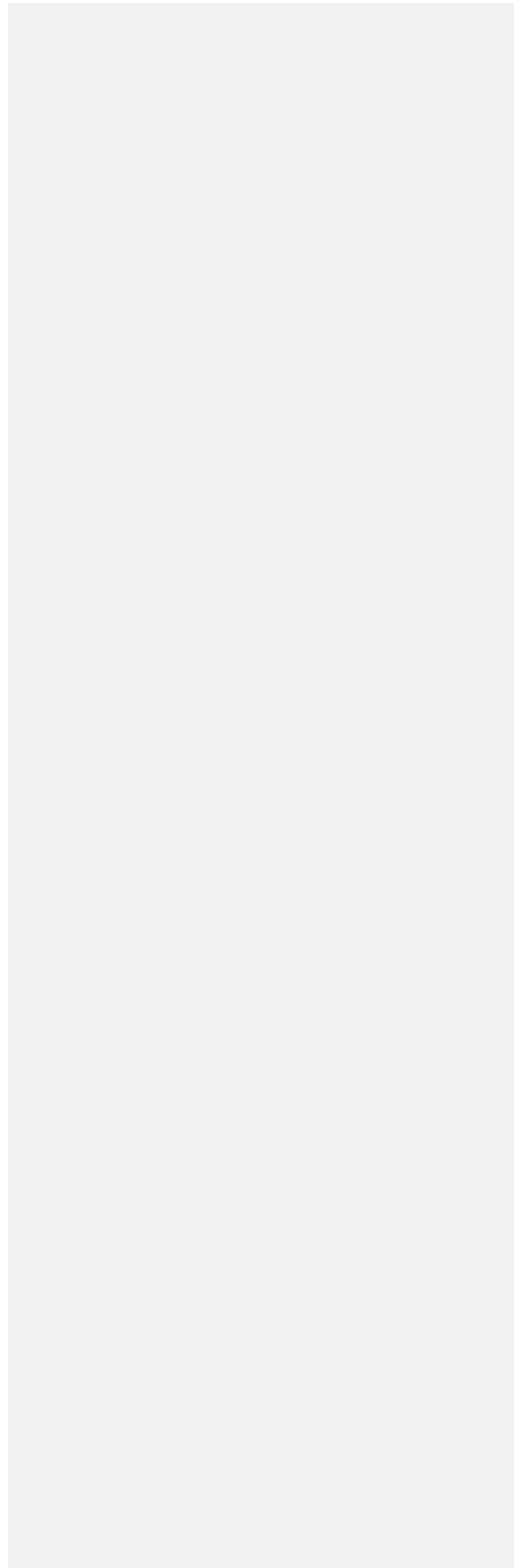
- a. The statutory maximum valuation interest rate shall be determined separately for each certificate, considering its premium determination date, the certificate holder's initial age, the reference period corresponding to its form of payout and whether the contract is a jumbo contract or a non-jumbo contract.

**Guidance Note:** Under some group annuity contracts, certificates may be purchased on different dates.

- b. In the case of a certificate whose form of payout has not been elected by the beneficiary at its premium determination date, the statutory maximum valuation interest rate shall be based on the reference period corresponding to the normal form of payout as defined in the contract or as is evidenced by the underlying pension plan documents or census file. If the normal form of payout cannot be determined, the maximum valuation interest rate shall be based on the reference period corresponding to the annuity form available to the certificate holder that produces the most conservative rate.

**Guidance Note:** The statutory maximum valuation interest rate will not change when the form of payout is elected.

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**Page 14: [1] Commented [X103] TDI 11/9/2021 8:56:00 AM**

Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly reflected. Recommend deleting the whole section 1.C.3 including item (a) and item (b).

**Page 14: [2] Commented [X107] TDI 11/9/2021 8:59:00 AM**

The revised language "sudden and significant levels of withdrawal and surrenders" replaces the original language "run on the bank" and is less clear. Does "significant" mean severe or extreme? Or just appreciably? Withdrawals and surrenders certainly may vary by projected economic scenarios. Recommend using the original language "run on the bank" that had a clearer intent.

**Page 15: [3] Commented [X115] ACLI**

It seems the definitions included in this section are largely only used for the purpose of establishing the Scope in Section 2. Since this is intended to be a principles-based methodology, recommend a strong definition of "Fixed Annuity" instead of specific products underneath this business. The first paragraph in A. Scope seems to provide this with specific references which are out of scope. If changing the scope section, we would suggest deleting the various product definitions if not used elsewhere; if these definitions are potentially applied beyond VM-22, we would suggest moving any necessary definitions to VM-01.

**Page 15: [4] Commented [VM22116R115] VM-22 Subgroup 6/23/2022 9:09:00 AM**

No objections from the Subgroup to an approach that is broader and focuses less on definitions. Modifications are included in the latest draft to remove some definitions, change the scope section to point to VM Section II, and add principles to VM Section II.

**Page 15: [5] Commented [CD117] CA DOI 12/30/2021 3:11:00 PM**

The format of this Definitions section is inconsistent with other parts of the VM. In VM-01 and VM-21, each defined term is numbered, and is defined in this format (for example):

1. The term "buffer annuity" is interchangeable with the term "registered index-linked annuity (RILA)", as defined in Section 1.D.?

**Page 15: [6] Commented [VM22118R117] VM-22 Subgroup 6/23/2022 9:03:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [7] Commented [X119] TDI 11/9/2021 9:04:00 AM**

The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity (RILA) since Buffer Annuity is a subset of RILA. RILA can have different downside protections such as "Buffer" or "Floor". Recommend deleting Buffer Annuity or add descriptions for Buffer Annuity as a subtype in the RILA definition.

**Page 15: [8] Commented [VM22120R119] VM-22 Subgroup 6/23/2022 9:04:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [9] Commented [X122] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 15: [10] Commented [VM22123R122] VM-22 Subgroup 6/23/2022 9:04:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [11] Commented [VM22125R124] VM-22 Subgroup 6/23/2022 9:04:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [12] Commented [X124] TDI 11/9/2021 9:05:00 AM**

The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Page 15: [13] Commented [VM22126] VM-22 Subgroup 9/8/2022 1:33:00 PM**

Removed, as no reference is currently made

**Page 15: [14] Commented [X127] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as FIA does there need to be guaranteed principle?

**Page 15: [15] Commented [VM22128R127] VM-22 Subgroup 6/23/2022 9:04:00 AM**

The definition is removed in the latest draft

**Page 15: [16] Commented [VM22130R129] VM-22 Subgroup 6/23/2022 9:05:00 AM**

The definition is removed in the latest draft

**Page 15: [17] Commented [X131] TDI 11/9/2021 9:07:00 AM**

The definition of FIA describes the account value as typically with guaranteed principal. Since FIA always has the guaranteed principal, recommend deleting the wording “typically”.

**Page 15: [18] Commented [VM22132R131] VM-22 Subgroup 6/23/2022 9:04:00 AM**

The definition is removed in the latest draft

**Page 15: [19] Commented [VM22133] VM-22 Subgroup 9/8/2022 1:33:00 PM**

Removed, as no reference is currently made

**Page 17: [20] Commented [VM22163R162] VM-22 Subgroup 6/23/2022 9:12:00 AM**

The definition is removed in the latest draft

**Page 17: [21] Commented [X165] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance, it would be helpful to clarify where a longevity swap contract falls within these definitions. Notably, index-based longevity swaps should be out of scope as they do not meet definition of “annuity contract” in SSAP 50. It should also be made explicit that PRT contracts can include lump sum benefits, death benefits and cash balance benefits as well.

**Page 17: [22] Commented [VM22166R165] VM-22 Subgroup 7/13/2022 4:13:00 PM**

Academy will review this comment as part of revisiting the longevity reinsurance definition.

**Page 17: [23] Commented [VM22167] VM-22 Subgroup 9/8/2022 2:13:00 PM**

Moved to VM-01 and definition changed to "Index-Linked Variable Annuity"

**Page 17: [24] Commented [VM22171R170] VM-22 Subgroup 6/23/2022 9:13:00 AM**

Edits to remove "Buffer Annuity" will be reflected in next exposure

**Page 17: [25] Commented [X170] TDI 11/9/2021 9:11:00 AM**

If need to address Buffer Annuity (not sure this is needed), can add here as a subset of RILA.

**Page 17: [26] Commented [X168] ACLI**

It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product from VM-22 requirements.

**Page 17: [27] Commented [VM22169R168] VM-22 Subgroup 6/23/2022 9:12:00 AM**

ACLI already following up on a proposal to address the scope and definitions, which will address this issue.

**Page 17: [28] Commented [X173] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 17: [29] Commented [VM22174R173] VM-22 Subgroup 6/23/2022 9:13:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 17: [30] Commented [VM22176R175] VM-22 Subgroup 6/23/2022 9:13:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 17: [31] Commented [X175] TDI 11/9/2021 9:06:00 AM**

The wording "after (or from)" the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as "from" the issue date.

**Page 19: [32] Commented [VM22196R195] VM-22 Subgroup 6/23/2022 9:14:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [33] Commented [VM22202R199] VM-22 Subgroup 6/23/2022 9:14:00 AM**

The VM-22 Subgroup voted to adopted "Option 1" for Reserving Categories

**Page 19: [34] Commented [VM22201R199] VM-22 Subgroup 3/2/2022 4:12:00 PM**

See Equitable comment letter: supports full aggregation, but if choosing between the two exposed options for two reserving categories, prefers option 2.



**Page 19: [35] Commented [VM22200R199] VM-22 Subgroup 3/2/2022 2:59:00 PM**

See NY comment letter: supports option 1, with additional category for "other" for any other contract with supporting assets such that there is greater reinvestment and longevity risks, than disintermediation risk and other risks associated with policyholder behavior as of the valuation date.

**Page 19: [36] Commented [X199] TDI 11/9/2021 9:23:00 AM**

The reserving categories for VM-22 are not included in Scope. Recommend including the defined reserving categories in the section when outlining Scope.

**Page 19: [37] Commented [X197] ACLI**

We would support reworking this section to rely on principles, rather than definitions to determine what is in and out of scope. As product innovation continues, a simple list may not appropriately accommodate the applicability of this chapter. However, if such a list is included, then we believe it should align with the full list presented in Section 13.

**Page 19: [38] Commented [VM22198R197] VM-22 Subgroup 6/23/2022 9:16:00 AM**

No objections from the Subgroup to an approach that is broader and focuses less on definitions. Modifications are included in the latest draft to remove some definitions, change the scope section to point to VM Section II, and add principles to VM Section II.

**Page 19: [39] Commented [VM22204R203] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [40] Commented [CD203] CA DOI 12/30/2021 3:27:00 PM**

suggest numbering the paragraphs within this section

**Page 19: [41] Commented [CD205] CA DOI 12/30/2021 3:27:00 PM**

suggest swapping the order of this section. That is, start with the "in scope" list, rather than the "out of scope" list.

Also, it seems like there should be specific mentions of GMDBs and GLBs, as there are in VM-21, since those guarantees can also be found on FIAs.

**Page 19: [42] Commented [VM22206R205] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [43] Commented [X207] TDI 11/9/2021 9:12:00 AM**

Since buffer annuities are a subset of RILA, recommend deleting buffer annuities.

**Page 19: [44] Commented [VM22208R207] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [45] Commented [CD209] CA DOI 12/30/2021 3:28:00 PM**

this is not defined in the Definition section. should it be?

**Page 19: [46] Commented [VM22210R209] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [47] Commented [X211] TDI 11/9/2021 9:17:00 AM**

This needs to be revised to be in line with VM-21 Section 2.A. Consider removing "such as" list and adding a cross-reference to VM-21 Section 2.A.

**Page 19: [48] Commented [VM22212R211] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [49] Commented [CD213] CA DOI 12/30/2021 3:28:00 PM**

should this be "non-variable annuities" since that is term used in Section 1.A?

**Page 19: [50] Commented [VM22214R213] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [51] Commented [VM22218R217] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [52] Commented [VM22216R215] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [53] Commented [VM22220R219] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [54] Commented [VM22222R221] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 19: [55] Commented [CD223] CA DOI 12/30/2021 3:31:00 PM**

should this be "Non-Variable Annuity"? Otherwise, should "Fixed Annuity" be defined in the Definitions section?

**Page 19: [56] Commented [VM22224R223] VM-22 Subgroup 6/23/2022 9:18:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 20: [57] Commented [X231] TDI 11/9/2021 9:19:00 AM**

Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here is more problematic because you can be excluded from the SR but still subject to VM-22.

**Page 20: [58] Commented [X235] TDI 11/9/2021 9:25:00 AM**

We still have a question about whether RBC factors are still at an appropriate level, if principles-based capital is not developed. Were they set assuming that this reserve was at a CTE(70) level in the first place, or were they dependent on the prior framework?

**Page 20: [59] Commented [X237] TDI 11/9/2021 9:33:00 AM**

Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section references, or update proposal to have the PBR and non-PBR sections of this VM-22 draft in different chapters. After having reviewed, we think it would be much more clear to reconsider the use of "VM-23" for the PBR requirements to avoid ambiguity around scope/exclusions. The non-PBR sections also just don't seem to fit in this draft, and there is now ambiguity around whether other parts of VM-22 apply to them (scope, effective date, principles, etc.).

**Page 20: [60] Commented [X241] TDI 11/9/2021 9:28:00 AM**

Can a company wait until the end of the transition period to start PBR, but then apply PBR to the issues from during the transition period? This was unclear for VM-20, and still seems unclear here. Need to be explicit one way or the other.

**Page 20: [61] Commented [VM22244R243] VM-22 Subgroup 6/23/2022 9:20:00 AM**

Discussed with Subgroup and decided to not have early adoption before the start of the three year transition period.

**Page 20: [62] Commented [CD243] CA DOI 12/30/2021 3:33:00 PM**

Will we (or should we) allow for any early adopters (like we did for VM-21)? It would seem reasonable to us to consider accommodating early adopters

**Page 20: [63] Commented [VM22242R241] VM-22 Subgroup 6/23/2022 9:19:00 AM**

Discussed with Subgroup and decided to keep the VM-22 language silent on this issue, similar to VM-20, leaving it to be determined on a case-by-case basis for each state.

**Page 23: [64] Commented [CD263] CA DOI 12/30/2021 3:35:00 PM**

suggest expanding header to "Stochastic Exclusion Test", for clarity

**Page 23: [65] Commented [VM22264R263] VM-22 Subgroup 7/19/2022 4:45:00 PM**

No objections from the Subgroup

**Page 23: [66] Commented [X265] ACLI**

Seems to imply that only SPIAs would pass due to the linkage to Section 13. But the reference to interest rates should be broader, if even necessary. Suggest editing as:

"these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, and VM-C, and with the statutory maximum valuation rate for immediate annuities specified in Section 13."

**Page 23: [67] Commented [VM22266R265] VM-22 Subgroup 6/23/2022 11:26:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 23: [68] Commented [CD267] CA DOI 12/30/2021 3:36:00 PM**

Suggest rewording to just say "the stochastic exclusion test". There is only 1 SET, with 3 ways of passing it. Therefore, the current wording is confusion because it suggests that there are multiple SETs.

**Page 23: [69] Commented [VM22268R267] VM-22 Subgroup 6/23/2022 9:23:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 23: [70] Commented [X269] ACLI**

We believe this guidance note is unnecessary as the intent of the section is clear, and the wording is possibly confusing.

**Page 23: [71] Commented [VM22270R269] VM-22 Subgroup 7/19/2022 4:46:00 PM**

No objections to removing this guidance note.

**Page 23: [72] Commented [X271] TDI 11/9/2021 9:57:00 AM**

The statement in this section is not acceptable as discussed in the previous TX comment letter. This will have the effect of potentially masking blocks that need PBR.

**Page 23: [73] Commented [VM22272R271] VM-22 Subgroup 6/23/2022 9:26:00 AM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure

**Page 23: [74] Commented [X273] ACLI**

This section seems to indicate that the grouping of contracts in exclusion testing should be the same as the grouping of contracts for aggregation. This might cause fewer product types to be qualifying for exclusion if the test must be performed at a higher level of aggregation.

**Page 23: [75] Commented [VM22274R273] VM-22 Subgroup 6/23/2022 9:27:00 AM**

Subgroup voted to use wording consistent with VM-20, which prohibits aggregating contracts with significantly different risk profiles.

**Page 23: [76] Commented [CD275] CA DOI 12/30/2021 3:42:00 PM**

for clarity, change this reference to "Section 3.D"

**Page 23: [77] Commented [VM22276R275] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 23: [78] Commented [CD277] CA DOI 12/30/2021 3:41:00 PM**

again, suggest rewording this to just say "the stochastic exclusion test"

**Page 23: [79] Commented [VM22278R277] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 23: [80] Commented [VM22280R279] VM-22 Subgroup 7/16/2022 9:55:00 PM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure.

**Page 23: [81] Commented [X281] ACLI**

Either in this item or in Section 12 allocation to contracts not covered by PBR methodology in VM-22 needs to be addressed e.g., carve out because reserves calculated on seriatim formulaic basis.

**Page 23: [82] Commented [VM22282R281] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 23: [83] Commented [X283] ACLI**

This sub-section seems more appropriate in Section 4 (or pulled out completely and consolidated within "I. Introduction" or "VM-01" and applied to all PBR methods).

**Page 23: [84] Commented [VM22284R283] VM-22 Subgroup 7/16/2022 9:57:00 PM**

The Subgroup decided to focus solely on VM-22 for now and hold off exploring on common principles and assumptions sections

**Page 23: [85] Commented [CD285] CA DOI 12/30/2021 3:43:00 PM**

VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques is missing (including the Guidance Note). Would it make sense to add it?

**Page 23: [86] Commented [VM22286R285] VM-22 Subgroup 7/19/2022 4:49:00 PM**

Subgroup decided to add this section.

**Page 23: [87] Commented [VM22288R287] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 26: [88] Commented [X313] TDI 11/9/2021 10:38:00 AM**

If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below.

Recommend specifying the revenue in this bullet to be gross premium since there are other revenue items that are discussed in other bullets.

**Page 26: [89] Commented [X317] ACLI**

The purpose of this guidance note is not clear as these charges would be reflected in the cash flows.

**Page 26: [90] Commented [X321] TDI 11/9/2021 10:42:00 AM**

Changed investment expense to be maintenance expense so that it does not repeat what is included in bullet h.

**Page 26: [91] Commented [X325] TDI 11/9/2021 10:41:00 AM**

Take out the revenues that covers the investment expenses and added a separate bullet under bullet "a" for other revenues.

**Page 26: [92] Commented [CD327] CA DOI 12/30/2021 3:53:00 PM**

Both net and gross cash flows have to be considered, so I don't agree with the addition of "Net" here

**Page 30: [93] Commented [VM22379R378] VM-22 Subgroup 7/5/2022 12:38:00 PM**

Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Page 43: [94] Commented [CD472] CA DOI 12/30/2021 4:09:00 PM**

should this be "stochastic reserve", since Section 4 is about determining the stochastic reserve.

**Page 43: [95] Commented [VM22473R472] VM-22 Subgroup 3/3/2022 3:08:00 PM**

Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve if not using the SET

**Page 43: [96] Commented [VM22479R478] VM-22 Subgroup 8/24/2022 4:36:00 PM**

Subgroup decided to use consistent language as the changes made to VM-21 in APF 2020-12

**Page 43: [97] Commented [X480] TDI 11/18/2021 9:44:00 PM**

Is "associated with the contracts" the same as the earlier use of "supporting the contracts"? Should the same verbiage be used here? If there is asset hedging for the assets supporting the contracts, it should be included. Need to define "solely supporting" index credits, and also have criteria on the effectiveness/error and documentation of any such hedging that is allowed for excluded business.

**Page 43: [98] Commented [VM22481R480] VM-22 Subgroup 8/24/2022 4:36:00 PM**

Academy will consider potential language to be more specific with respect to "hedging programs solely supporting index credits" during the upcoming exposure period

**Page 43: [99] Commented [VM22482] VM-22 Subgroup 6/23/2022 1:16:00 PM**

Subgroup voted to permit SPIAs below a certain duration to automatically pass the exclusion test, assuming there is limited optionality, level/near-level payments, and not PRT or longevity reinsurance. The Academy has agreed to develop a proposed duration threshold.

**Page 43: [100] Commented [VM22483] VM-22 Subgroup 7/5/2022 4:21:00 PM**

New language drafted by select Subgroup Members to provide certain conditions under which SPIA contracts could automatically pass the exclusion test

**Page 43: [101] Commented [VM22484R483] VM-22 Subgroup 8/24/2022 4:37:00 PM**

Academy will provide a proposed durational threshold in this language during the next exposure.

**Page 43: [102] Commented [CD485] CA DOI 12/30/2021 4:11:00 PM**

Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstration or Certifications). The language gets confusing (here and elsewhere) when you start saying there are different "types" of SETs.

**Page 44: [103] Commented [CD487] CA DOI 12/30/2021 4:11:00 PM**

not sure why this part is deleted. Suggest adding it back in.

**Page 44: [104] Commented [VM22488R487] VM-22 Subgroup 6/23/2022 10:10:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [105] Commented [X489] ACLI**

We recommend removing "pension risk transfer business" from products scoped out of SET certification method. It is unclear why this business would be treated differently from individually issued business for testing intended to capture interest rate risk.

**Page 44: [106] Commented [VM22490R489] VM-22 Subgroup 3/2/2022 2:51:00 PM**

Subgroup voted to keep PRT ineligible for the Certification Method

**Page 44: [107] Commented [CD491] CA DOI 12/30/2021 4:12:00 PM**

See earlier comments about the use of "future"

**Page 44: [108] Commented [VM22492R491] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 44: [109] Commented [VM22494R493] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 44: [110] Commented [VM22498R497] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [111] Commented [VM22496R495] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [112] Commented [CD499] CA DOI 12/30/2021 4:14:00 PM**

what is meant by "aggregate risk levels"? Aggregated across what? Need clarification on the intentions for adding this phrase, when it is not in VM-20. Otherwise, i would suggest deleting this.

**Page 44: [113] Commented [VM22500R499] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [114] Commented [X501] TDI 11/18/2021 9:49:00 PM**

This is not in VM-20 and would substantially change the exclusion. The intent is not to allow you to group a block that has material interest rate risk with a larger block that is insensitive to interest rate risks and thereby pass. If "aggregate" referred to potential compounding of interest rate, longevity, or asset risk then this could be redrafted

to clearly call out a 4th category of risk due to a combination of the first three. However, I think this is already implicitly covered.

**Page 44: [115] Commented [VM22502R501] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [116] Commented [VM22504R503] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [117] Commented [CD505] CA DOI 12/30/2021 4:15:00 PM**

note, there is no insertion of "aggregate risk levels across" here, like there was above. (to be clear, i don't support adding it.)

**Page 44: [118] Commented [VM22506R505] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [119] Commented [CD507] CA DOI 12/30/2021 4:16:00 PM**

This wording is a little clunky here. My suggestion:

"A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great..."

**Page 44: [120] Commented [VM22508R507] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [121] Commented [VM22510R509] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [122] Commented [X509] TDI 9/7/2021 9:28:00 AM**

Replace all "contracts" with "contracts and certificates"

**Page 44: [123] Commented [VM22512R511] VM-22 Subgroup 8/24/2022 8:12:00 PM**

No objections from Subgroup members

**Page 44: [124] Commented [VM22514R513] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [125] Commented [VM22516R515] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [126] Commented [VM22518R517] VM-22 Subgroup 6/23/2022 1:36:00 PM**

Edits to address this comment will be reflected in next exposure

**Page 44: [127] Commented [X519] TDI 11/18/2021 10:37:00 PM**

Need to add a review of the company's mortality and/or longevity risk.



**Page 44: [128] Commented [VM22520R519] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 44: [129] Commented [X521] ACLI**

As written, the SERT assumes a single premium product given the change of the denominator to the scenario reserve. Alternative product designs (such as longevity swap) could result in unintended results. We recommend maintaining consistency with VM-20 and using a denominator of future benefits (annuity payments, DBs, etc., excluding premium considerations, expenses, etc.).

**Page 44: [130] Commented [VM22522R521] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 44: [131] Commented [X523] TDI 11/18/2021 9:53:00 PM**

Using (a) in the denominator instead of VM-20's (c) which is a PV of benefits could make this ratio unstable when the scenario reserve (a) is very small. This is particularly applicable if the block being tested does not have CSV.

**Page 44: [132] Commented [VM22524R523] VM-22 Subgroup 6/23/2022 10:13:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 44: [133] Commented [X525] TDI 11/18/2021 9:59:00 PM**

The variability should be assured to be immaterial based on the company's materiality standard.

**Page 44: [134] Commented [VM22526R525] VM-22 Subgroup 8/24/2022 8:12:00 PM**

No objections from Subgroup members, but made modification to change "greater" to "lesser", in line with the intention

**Page 45: [135] Commented [VM22548R547] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 45: [136] Commented [CD547] CA DOI 12/30/2021 4:18:00 PM**

better to keep the reference to the full Section (i.e., Section 7.C.1)

**Page 45: [137] Commented [VM22546R545] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 45: [138] Commented [VM22550R549] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 45: [139] Commented [CD549] CA DOI 12/30/2021 4:20:00 PM**

why delete this? seems like it wouldn't hurt to keep this language, for additional clarity

**Page 45: [140] Commented [X551] TDI 11/18/2021 10:09:00 PM**

Be consistent with standard VM references

**Page 45: [141] Commented [VM22552R551] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 45: [142] Commented [CD553] CA DOI 12/30/2021 4:20:00 PM**

better to reference the full Section (i.e., Section 7.C.1.b)

**Page 45: [143] Commented [VM22554R553] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 51: [144] Commented [X619] TDI 11/19/2021 8:39:00 AM**

This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Instead, this should be addressed through the Error factor for new programs being temporarily larger.

**Page 51: [145] Commented [X621] TDI 11/19/2021 8:50:00 AM**

Reinstate the original sentence which puts the reflection of hedging into the greater context of reflecting the company's investment policy.

**Page 51: [146] Commented [X623] TDI 11/19/2021 8:42:00 AM**

Agree that the uncertainty associated with new strategies should be handled via the E factor, not through blanket exclusion.

**Recommended Revisions to VM-22 Exposure Draft****Section 3: Reserve Methodology**

...

**D. The Stochastic Reserve**

...

*[Insert new paragraph 4 as follows, and renumber existing paragraphs 4 and 5]*4. Do not aggregate Payout Annuities with Account Value Based Annuities.**Section 12: Allocation of Aggregate Reserves to the Contract Level**

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve; however, contracts for which the Deterministic Certification Option is elected in Section 7.E are subject to the allocation methodology described in this Section 12. ~~For the purpose of this section, if a contract does not have a cash surrender value, then the cash surrender value is assumed to be zero.~~

~~Contracts for which the Deterministic Certification Option is elected in Section 7.E are intended to use the methodology described in this section to allocate aggregate reserves in excess of the cash surrender value to individual contracts.~~

Under the allocation methodology described in this section, the reserve held for any contract will be no less than the cash surrender value provided under that contract, after consideration of any reinsurance. Additionally, the reserve held for a Payout Annuity contract (whether life-contingent or not) will be no less than the present value of the liability cash flows provided under the contract, after consideration of any reinsurance, discounted using the NAER described in Section 12.B.1 or 12.B.2, as applicable. The allocation methodology is a formulaic approach that is designed, generally, to allocate the excess aggregate reserves based on a measure of the risk and, therefore, to generally allocate a greater portion of the excess aggregate reserves to contracts that have greater risk. For example, an indexed annuity contract with a high benefit GLWB will typically have a larger allocated excess reserve than an otherwise identical indexed annuity contract with a low benefit GLWB or no GLWB.

A. The contract-level reserve for each contract shall be the sum of the following:

A.1. ~~The contract's cash surrender value~~ minimum allocation value (MAV), as defined in Section 12.C.

2. The contract's allocated excess reserve (AER), as defined in Section 12.D.

*[Delete the original Drafting Note describing the two potential options in the exposure draft, and delete the entire section with the heading "Option 1: VM-21 Approach," including Table 12.1. Also delete the heading "Option 2: Actuarial Present Value Approach." The following text is a marked-up version of the "Option 2: Actuarial Present Value Approach" section of the exposure draft.]*

B. Scenario actuarial present value (APV)~~The excess of the aggregate reserve over the aggregate cash surrender value is allocated to policies based on a calculation of the actuarial present value of projected liability cash flows in excess of the cash surrender value:~~

1. For a group of contracts for which a company does not elect the Deterministic Certification Option in Section 7.E, the Scenario APV for each contract is equal to the discounted ~~Discount the~~ liability cash flows at the NAER, pursuant to requirements in Section 4, for the scenario that produces the aggregate scenario reserve for the group that is closest to, but not less greater than, the stochastic reserve defined in Section 3.D.
- ~~a-2.~~ For a group of contracts for which a company elects ~~Groups of contracts that elect the~~ Deterministic Certification Option defined in Section 7.E, the Scenario APV for each contract is equal to the discounted liability cash flows at ~~shall use~~ the NAER in the single scenario used to calculate the reserve to discount liability cash flows.
3. *[reordered]* For projecting future liability cash flows under either Section 12.B.1 or 12.B.2, as applicable, assume the same liability assumptions that were used to calculate the stochastic reserve defined in Section 3.D.

C. Minimum allocation value (MAV)

1. For Payout Annuity contracts, the MAV is equal to the greater of:
  - a. The Scenario APV for the contract, or
  - b. The cash surrender value provided under the contract, if any.
2. For Account Value Based Annuity contracts, the MAV is equal to the cash surrender value provided under the contract, if any, otherwise zero.

D. Allocated excess reserve (AER)

1. For each contract in a group of contracts, the AER is determined by allocating the excess, if any, of the group's aggregate reserve over the group's aggregate MAV to the contract in proportion to the excess of the Scenario APV over the MAV for such contract.
2. *[reordered]* If the Scenario APV for any contract actuarial present value is less than the cash surrender value MAV, then the excess Scenario APV actuarial present value to be

used for allocating the excess aggregate reserve ~~to that contract over the cash value~~ shall be floored at zero.

- a-3. If all contracts in the group have an excess Scenario APV ~~actuarial present value~~ that is floored at zero, then use the MAV ~~cash surrender value~~ to allocate any excess aggregate reserve over the aggregate MAV ~~cash surrender value~~.
4. If a group's aggregate reserve is less than the group's aggregate MAV, that difference should be allocated to life contingent contracts in proportion to each life contingent contract's MAV to the sum of the life contingent contracts MAV.
- E. As a hypothetical example, consider a company with the results of the following five-eight contracts in two groups:

Table 12.1.A: Hypothetical Sample Allocation of Aggregate Reserve: Group A, Account Value Based Annuity Contracts

Contract	Example Product Type	CSV (1)	Scenario APV (2)	Minimum Allocation Value (MAV) (3) *	Excess (floored) of Scenario APV over MAV (4) = Max[(2)-(3),0]	Aggregate Reserve CTE 70 (5)	Excess of Aggregate Reserve over Aggregate MAV (6) = Max[(5 Total) -(3 Total),0]	Allocated Excess Reserve (7) = (4) x [(6 Total)/ (4 Total)]	Total Contract Level Reserve (8) = (3)+(7)
1	Individual annuity w/ no GLWB	95.0	91.0	95.0	-			-	95.0
2	Indexed annuity w/ low benefit GLWB	92.0	98.0	92.0	6.0			6.3	98.3
3	Indexed annuity w/ medium benefit GLWB	90.0	104.0	90.0	14.0			14.7	104.7
4	Indexed annuity w/ high benefit GLWB	88.0	111.0	88.0	23.0			24.1	112.1
Total		365.0	404.0	365.0	43.0	410.0	45.0	45.0	410.0

\* MAV for Payout Annuity contracts equals Max[(1), (2)]. MAV for Account Value Based Annuity contracts equals (1) if any, otherwise zero.

Table 12.1.B: Hypothetical Sample Allocation of Aggregate Reserve: Group B, Payout Annuity Contracts that do not have Cash Surrender Values

Contract	Example Product Type	CSV (1)	Scenario APV (2)	Minimum Allocation Value (MAV) (3) *	Excess (floored) of Scenario APV over MAV (4) = Max[(2)-(3),0]	Aggregate Reserve CTE 70 (5)	Excess of Aggregate Reserve over Aggregate MAV (6) = Max[(5 Total) -(3 Total),0]	Allocated Excess Reserve (7) = (3) x [(6 Total)/ (3 Total)] **	Total Contract Level Reserve (8) = (3)+(7)
1	Fixed Life Contingent payout annuity	-	91.0	91.0	-			1.4	92.4
2	Fixed Life Contingent payout annuity	-	111.0	111.0	-			1.6	112.6
3	Fixed Non-life Contingent payout annuity	-	98.0	98.0	-			1.5	99.5
4	Fixed Non-life Contingent payout annuity	-	104.0	104.0	-			1.5	105.5
Total		-	404.0	404.0	-	410.0	6.0	6.0	410.0

\* MAV for Payout Annuity contracts equals Max[(1), (2)]. MAV for Account Value Based Annuity contracts equals (1) if any, otherwise zero.

\*\* Because all contracts have an excess Scenario APV of 0, the AER is allocated in proportion to MAV.

**Guidance Note:** The Scenario actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the Scenario APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

II – Reserve Requirements Subsection 2: Annuity Products (new item D)

D. Annuity PBR Exemption

1. A company meeting at least one of the conditions in Subsection 2.D.2 below may file a statement of exemption for annuity contracts or certificates, except for contracts or certificates in Subsection 2.D.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-22. If a company has no business issued directly or assumed during the current calendar year that would otherwise be subject to VM-22, a statement of exemption is not required. For a filed statement of exemption, the statement must be filed with the domiciliary commissioner prior to July 1 of that year certifying that at least one of the two conditions in Subsection 2.D.2 was met, and the statement of exemption must also be included with the NAIC filing for the second quarter of that year.

The domiciliary commissioner may reject such statement prior to Sept. 1 and require the company to follow the requirements of VM-22 for the annuity contracts or certificates covered by the statement.

If a filed statement of exemption is not rejected by the domiciliary commissioner, the filing of subsequent statements of exemption is not required as long as the company continues to qualify for the exemption; rather, ongoing statements of exemption for each new calendar year will be deemed to not be rejected, unless: 1) the company does not meet either condition in Subsection 2.D.2 below; 2) the contracts contain those in Subsection 2.D.3 below; or 3) the domiciliary commissioner contacts the company prior to Sept. 1 and notifies them that the statement of exemption is rejected. If any of these three events occur, then the statement of exemption for the current calendar year is rejected, and a new statement of exemption must be filed and not rejected in order for the company to exempt additional contracts or certificates. In the case of an ongoing statement of exemption, rather than include a statement of exemption with the NAIC filing for the second quarter of that year, the company should enter “SEE EXPLANATION” in response to the Annuity PBR Exemption supplemental interrogatory and provide as an explanation that the company is utilizing an ongoing statement of exemption.

2. Condition for Exemption:

- a. The company has less than \$3 billion of exempted prior year reserves, and if the company is a member of an NAIC group that includes other life insurance companies, the group has combined exempted prior year reserves of less than \$6 billion: or
- b. The only new contract or certificates that would otherwise be subject to VM-22 being issued or assumed by the company are due to election of contract benefits or features from existing contracts or certificates valued under VM-A and VM-C and the company was exempted from, or otherwise not subject to, the requirements of VM-22 in the prior year.

**Commented [BB1]:** Suggested threshold updated to \$3 billion for company and \$6 billion for group

Exemption reserves are determined as follows:



- a. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 2 (“Fixed Annuities”), line 15; plus
- b. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 3 (“Indexed Annuities”), line 15; plus
- c. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Individual Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuitizations)”), line 15; plus
- d. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 2 (“Fixed Annuities”), line 15; plus
- e. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 3 (“Indexed Annuities”), line 15; plus
- f. The amount reported in the prior calendar year life/health annual statement, Analysis of Increase Reserve in Reserves During the Year-Group Annuities, Column 6 (“Life Contingent Payout (Immediate and Annuitizations)”), line 15.

**Commented [BB2]:** NAIC should determine the appropriate reserves items to include in the reserve calculation for the limits

3. Contracts and Certificates Excluded from the Annuity PBR Exemption:

- a. Contracts or certificates with guaranteed living benefits (GMIBs, GMABs, GMMBs, GLWBs).

**Commented [BB3]:** From 4/13 VM-22 (A) Subgroup call

4. Each exemption, or lack of an exemption, outlined in Subsection 2.D.1 – Subsection 2.D.3 above applies only to contracts or certificates issued or assumed in the current year, and it applies to all future valuation dates for those contracts or certificates. However, if contracts or certificates did not qualify for the Annuity PBR Exemption during the year of issue but would have qualified for the Annuity PBR Exemption if the current Valuation Manual requirements had been in effect during the year of issue, then the domiciliary commissioner may allow an exemption for such contracts or certificates. The minimum reserve requirements for the annuity contracts and certificates subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality tables as defined in VM-M.

Draft: 10/6/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
September 7, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Sept. 7, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Ahmad Kamil, Elaine Lam, and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Nicole Boyd (KS); William Leung (MO); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA)

1. Reviewed “Tier 3” Comments in VM-22 Draft – Sections 7–11

Mr. Slutsker noted that the purpose of the meeting was to continue to get through the remaining “Tier Three” comments (Attachment Twenty-Seven-A). He said that the “Tier Four” comments would not require discussion of the Subgroup given that these comments are largely editorial in nature. He noted that the goal of the Subgroup is to re-expose a draft of VM-22 with the bulk of the comments addressed by Oct. 25.

Mr. Slutsker addressed a comment in Section 4.B.1.b relating to the treatment of a market value adjustment (MVA) when applying a cash surrender value (CSV) floor to the scenario reserve. Ms. Hemphill noted an existing guidance note in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, that specified that the application of an MVA when determining the CSV floor must be consistent with how the annual statement value of assets are treated. Mr. Carmello noted that in New York, companies can hold assets that support MVA annuities at market value or book value and that the inclusion of an MVA in the CSV floor should be consistent with how the assets are held on the annual statement. Mr. Leung noted that sometimes the MVA formula does not perfectly track with the market value of the assets. Mr. Carmello replied that it would add too much volatility in the reserves to not apply the MVA to the CSV floor in a consistent manner with how the assets are held. Mr. Slutsker then called for a voice vote to determine whether to: 1) remove the language that specified that the MVA should always be applied to the CSV floor and add a sentence specifying that the MVA should be applied consistently with how the assets are valued; or 2) keep the existing language. The Subgroup unanimously decided to go with the first option. Mr. Serbinowski asked for a disclosure item for companies to report real CSV compared to the market value of their assets.

Mr. Slutsker then discussed a comment in Section 7.E.1.b on whether the deterministic certification option (DCO) was meant to exclude contracts that are supported by index hedging, such as fixed-indexed annuities. Chris Conrad (American Academy of Actuaries—Academy) noted that the intention of the drafters was to exclude these contracts from being able to use the DCO.

Mr. Slutsker said that the Texas Department of Insurance (TDI) had made a comment to delete the guidance note at the end of Section 7.E.2 that indicated the DCO was intended for single premium immediate annuities (SPIAs) or similar products. Ms. Hemphill noted the potential that the DCO would not be appropriate for some SPIAs and that it could be appropriate for other products. Mr. Slutsker said the guidance note would be deleted from the draft.

Mr. Slutsker said that the TDI comment on Section 9.B.4 was to understand if a better hedging strategy example could be added to the guidance note for greater relevance to VM-22. He said that the hedging example will be removed from the guidance note in the next exposure.

Mr. Slutsker said that the TDI had asked about the source of a guidance note under Section 10.D.2.c relating to the incidence rates to use for certain non-elective benefits. Mr. Conrad noted that this language came from *Actuarial Guideline XXXIII—Determining CARVM Reserves for Annuity Contracts with Elective Benefits* (AG 33). This language was later edited and brought into Section 10.D.2.c, and the guidance note was deleted. The draft language remained unchanged after the Subgroup’s discussion.

Mr. Slutsker said that the American Council of Life Insurers (ACLI) commented that the language in Section 10.D.8 contradicted Section 6.H.2, which prescribes 100% efficient policyholder behavior, and that the language in Section 6.H.2 should be aligned with the language in Section 10.D.8. Mr. Conrad noted that the Academy agreed with the ACLI’s comment and suggested either striking the contradictory language in Section 6.H.2. or replacing with: “Benefit usage may be assumed even if the policyholder has not previously taken any action to use the benefit.” The Subgroup did not decide on a direction for the language before the meeting ended, and it agreed to resume the discussion during its next meeting.

Having no further business, the VM-22 (A) Subgroup adjourned

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/09 07/9\_7 VM-22 Minutes.docx

**Comment Categories:**

- Tier 1: **Key Decision Points** – Discuss first
- Tier 2: **High Substance Edits** – Discuss second
- Tier 3: **Moderate Substance Edits** – Discuss third
- Tier 4: **Noncontroversial or Low Substance Edits** – Will expose and only discuss upon comment

**VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities**

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**Commented [CD1]:** Please clarify which version (i.e., effective date) of the VM was used for the comparison. Before any changes for VM-22 are adopted, a final comparison against the latest version of the VM will need to be performed.

**Commented [VM222R1]:** Final comparison to be made prior to adoption

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Commented [X3]: Note that part of the 2022 VM updates was to replace all instances of "stochastic reserve" with "SR" other than the initial definition in VM-01.

Commented [VM224R3]: Edit to be reflected in next exposure

Section 1: Background

A. Purpose

Sections 1 through 13 of these requirements establish the minimum reserve valuation standard for non-variable annuity contracts as defined in Section 2.A and issued on or after 1/1/2024. Section 14 of these requirements establish the maximum valuation rate for payout annuities for contracts issued on or after 1/1/2018. For all contracts encompassed by the Scope, these requirements constitute the Commissioners Annuity Reserve Valuation Method (CARVM) and, for certain contracts and certificates, the Commissioners Reserve Valuation Method (CRVM).

**Guidance Note:** CRVM requirements apply to some group pension contracts.

**Drafting Note:** There is a guidance note in VM-21 explains that the reserve projection requirements are generally consistent with RBC C-3 Phase II requirements. However, it was decided to exclude this guidance note from VM-22 for the time being, though this may be revisited depending on whether further updates are made to the C-3 Phase I capital framework.

**Guidance Note:**  
 Relationship to RBC Requirements  
 These requirements anticipate that the projections described herein are used for the determination of RBC for all of the contracts falling within the scope of these requirements. These requirements and the RBC requirements for the topics covered within Sections 4.A through 4.E are identical. However, while the projections described in these requirements are performed on a basis that ignores federal income tax, a company may elect to conduct the projections for calculating the RBC requirements by including projected federal income tax in the cash flows and reducing the discount interest rates used to reflect the effect of federal income tax as described in the RBC requirements. A company that has elected to calculate RBC requirements in this manner may not switch back to using a calculation that ignores the effect of federal income tax without approval from the domiciliary commissioner.

B. Principles

The projection methodology used to calculate the stochastic reserve<sup>SR</sup> is based on the following set of principles. These principles should be followed when interpreting and applying the methodology in these requirements and analyzing the resulting reserves.

**Guidance Note:** The principles should be considered in their entirety, and it is required that companies meet these principles with respect to those contracts that fall within the scope of these requirements and are in force as of the valuation date to which these requirements are applied.

**Principle 1:** The objective of the approach used to determine the stochastic reserve<sup>SR</sup> is to quantify the amount of statutory reserves needed by the company to be able to meet contractual

**Commented [X5]:** The proposal suggests VM-22 is not operative until 1/1/2024, which contradicts Section 13 and existing requirements. We would suggest rewording this to clarify that Section 13 is effective after 12/31/2017. Further, we would suggest consistency in labeling of dates (either all text or all numeric).

**Commented [VM226R5]:** Edits to address this comment will be reflected in next exposure

**Commented [CD7]:** might be clearer to refer to "Section 2.A" here

**Commented [VM228R7]:** No objections from the Subgroup to an approach that is broader and focuses on Section 2.A. ACLI will follow-up with proposed revisions to the scope section

**Commented [X9]:** The statement only addresses "contracts". Recommend adding "and certificates". Need to do a holistic review if where "and certificates" may be needed.

**Commented [VM2210R9]:** Edits to address this comment will be reflected in next exposure

**Commented [X11]:** (Relationship to RBC Requirements): The VM-21 guidance note was not included in VM-22; however, we believe it would be appropriate to retain and reword to say, "products that calculate a stochastic reserve", since the relationship to RBC would likely be maintained.

**Commented [VM2212R11]:** Subgroup agreed to remove guidance note for now and replace with a drafting note that states the RBC reference will be revisited based on whether updates are made to the C-3 Phase I framework.

**Commented [X13]:** We would support consistent application of principles across all chapters as currently VM-20 does not have a like set of principles. We believe this could involve a broader discussion of the assorted product requirements in the VM. As a shorter-term fix, we would recommend generalizing the principles where appropriate and moving these to "Section 1, Introduction" or "VM-01" and equally applying to VM-20

**Commented [VM2214R13]:** Discussed with Subgroup. Members are open and interested to a common principles chapter, but decided to hold off on developing for now.

obligations in light of the risks to which the company is exposed with an element of conservatism consistent with statutory reporting objectives.

**Principle 2:** The calculation of the ~~stochastic reserve~~SR is based on the results derived from an analysis of asset and liability cash flows produced by the application of a stochastic cash-flow model to equity return and interest rate scenarios. For each scenario, the greatest present value of accumulated deficiency is calculated. The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions and prescribed guardrails) to allow the natural offset of risks within a given scenario. The methodology uses a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model and sets the ~~stochastic reserve~~SR at a degree of confidence using the CTE measure applied to the set of scenario specific greatest present values of accumulated deficiencies that is deemed to be reasonably conservative over the span of economic cycles.

**Guidance Note:** Examples where full aggregation between contracts may not be possible include experience rated group contracts and the operation of reinsurance treaties.

**Principle 3:** The implementation of a model involves decisions about the experience assumptions and the modeling techniques to be used in measuring the risks to which the company is exposed. Generally, assumptions are to be based on the conservative end of the confidence interval. The choice of a conservative estimate for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the ~~stochastic reserve~~SR at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the ~~stochastic reserve~~SR, the company should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

**Guidance Note:** The intent of Principle 3 is to describe the conceptual framework for setting assumptions. Section 10 provides the requirements and guidance for setting contract holder behavior assumptions and includes alternatives to this framework if the company is unable to fully apply this principle. More guidance and requirements for setting assumptions in general are provided in Section 12.

**Principle 4:** While a stochastic cash-flow model attempts to include all real-world risks relevant to the objective of the stochastic cash-flow model and relationships among the risks, it will still contain limitations because it is only a model. The calculation of the ~~stochastic reserve~~SR is based on the results derived from the application of the stochastic cash-flow model to scenarios, while the actual statutory reserve needs of the company arise from the risks to which the company is (or will be) exposed in reality. Any disconnect between the model and reality should be reflected in setting prudent estimate assumptions to the extent not addressed by other means.

**Principle 5:** ~~Neither a cash-flow scenario model nor a method based on factors calibrated to the results of a cash flow scenario model can completely quantify a company's exposure to risk. A model attempts to represent reality but will always remain an approximation thereto~~

**Commented [CD15]:** for consistency, will this edit be considered for VM-21 as well?

**Commented [VM2216R15]:** VM-22 Subgroup will initially focus on VM-22. Consistency with other VM chapters can be explored after development of initial Subgroup recommendation for VM-22.

**Commented [X17]:** We support this principle but note that later sections appear to contradict this principle. For example, the statement "The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions) to allow the natural offset of risks within a given scenario." contradicts with the introduction of additional reserve categories and other limitations (such as model segment restrictions).

**Commented [VM2218R17]:** No objections from subgroup members to include "and prescribed guardrails" in principal 2 to address the concern in this comment.

**Commented [X19]:** Principle 2: Recommend reinstating Guidance Note in Principle 2 to be consistent with VM-21.

**Commented [VM2220R19]:** No objections from Subgroup members to reinstating this guidance note.

**Commented [X21]:** We suggest deleting the sentence "Generally, assumptions are..." since it does not provide guidance. We also suggest tightening the remainder of the text for clarity.

**Commented [VM2222R21]:** Subgroup in favor of retaining language

**Commented [X23]:** ~~and general assumption guidance~~

**Commented [VM2224R23]:** Subgroup agreed with this comment. Edits to address this comment will be reflected in next exposure.

**Commented [X25]:** Principle 5 has the statement "nor a method based on factors calibrated to the results of a cash flow scenario model" which is intended for the Alternative Methodology in VM-21. The statement should be deleted from VM-22.

**Commented [VM2226R25]:** Edits to address this comment will be reflected in next exposure

and, hence, uncertainty in future experience is an important consideration when determining the stochastic reserve SR. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve solely to reduce the calculated stochastic reserve SR without also reducing risk on scenarios similar to those used in the actual cash-flow modeling are inconsistent with these principles. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit “foreknowledge” of the components of the required methodology.

**Commented [X27]:** We recommend deleting the third sentence (starting with “Therefore, the use of assumptions...”) because this lacks historical context and is covered by the final sentence.

**Commented [VM2228R27]:** Subgroup in favor of retaining language

C. Risks Reflected and Risks Not Reflected

**Commented [X29]:** Consistent with our comments in B, we would support consistent application of risks reflected across all chapters, rather than embedding the language in each chapter. Were this to be retained in VM-22, we would suggest maintaining consistency with VM-21 to avoid any confusion.

**Commented [VM2230R29]:** The Subgroup is open to a common chapter with all risks identified for different PBR frameworks, but decided to hold off on developing for now.

**Commented [CD31]:** VM-21 has “... and Risks Not Reflected” in this section header, which should be retained here since the section on risks not reflected is still in here.

**Commented [VM2232R31]:** Subgroup in favor of changing section header, as subsection 3 will be removed, but “risks not reflected” is still applicable to subsection 4

1. The risks reflected in the calculation of reserves under these requirements arise from actual or potential events or activities that are both:

- a. Directly related to the contracts falling under the scope of these requirements or their supporting assets; and
- b. Capable of materially affecting the reserve.

2. Categories and examples of risks reflected in the reserve calculations include, but are not necessarily limited to:

- a. Asset risks
  - i. Credit risks (e.g., default or rating downgrades).
  - ii. Commercial mortgage loan roll-over rates (roll-over of bullet loans).
  - iii. Uncertainty in the timing or duration of asset cash flows (e.g., shortening (prepayment risk) and lengthening (extension risk)).
  - iv. Performance of equities, real estate, and Schedule BA assets.
  - v. Call risk on callable assets.
  - vi. Separate account fund performance.

**Drafting Note:** Feedback welcome on whether to remove reference to separate accounts in VM-22. Whether references to separate accounts are retained or removed, consider making the treatment of such references consistent throughout VM-22.

**Commented [CD33]:** Can a non-variable annuity have a separate account fund? I am not aware of any such annuity, that is not a variable annuity. Furthermore, all references to separate accounts and fund performance were deleted from this draft. Thus, we should consider deleting this item from the list.

**Commented [VM2234R33]:** Decided to retain for now, but add a drafting note to solicit feedback and mention the draft should be consistent throughout (as CA pointed out that the comment was regarding being internally consistent within the VM-22 draft).

- vii. Risk associated with hedge instrument (includes basis, gap, price, parameter estimation risks, and variation in assumptions).
  - viii. Currency risk.
- b. Liability risks



- i. Reinsurer default, impairment, or rating downgrade known to have occurred before or on the valuation date.
  - ii. Mortality/longevity, persistency/lapse, partial withdrawal, and premium payment risks.
  - iii. Utilization risk associated with guaranteed living benefits.
  - iv. Anticipated mortality trends based on observed patterns of mortality improvement or deterioration, where permitted.
  - v. Annuitization risks.
  - vi. Additional premium dump-ins or deposits (high interest rate guarantees in low interest rate environments).
  - vii. Applicable expense risks, including fluctuation in maintenance expenses directly attributable to the business, future commission expenses, and expense inflation/growth.
- c. Combination risks
- i. Risks modeled in the company's risk assessment processes that are related to the contracts, as described above.
  - ii. Disintermediation risk (including such risk related to payment of surrender or partial withdrawal benefits).
  - iii. Risks associated with revenue-sharing income.
- ~~33. The risks not necessarily reflected in the calculation of reserves under these requirements are:~~
- a. ~~Those not associated with the policies or contracts being valued, or their supporting assets.~~
  - b. ~~Determined to not be capable of materially affecting the reserve.~~
34. Categories and examples of risks not reflected in the reserve calculations include, but are not necessarily limited to:
- a. Asset risks
    - i. Liquidity risks associated with a sudden and significant levels of withdrawals and surrenders. "run on the bank."
  - b. Liability risks
    - i. Reinsurer default, impairment or rating downgrade occurring after the valuation date.
    - ii. Catastrophic events (e.g., epidemics or terrorist events).

- Commented [CD35]:** Is there a distinction between "dump-ins" and "deposits"? Why are both words needed? Also, if it's determined that both words are needed, should this same change be made in VM-21?
- Commented [VM2236R35]:** Edits to address this comment will be reflected in next exposure
- Commented [X37]:** Recommend change to "fluctuation in" maintenance expenses for clarity.
- Commented [VM2238R37]:** Edits to address this comment will be reflected in next exposure
- Commented [CD39]:** should this same change also be made to VM-21?
- Commented [VM2240R39]:** Potential VM-21 will be examined separately from this Subgroup at a later point
- Commented [X41]:** We recommend removing the bullet "Risks modeled in the company's risk assessment processes that are related to the contracts, as described above" as this is unclear and probably extraneous.
- Commented [VM2242R41]:** Subgroup in favor of retaining language.
- Commented [X43]:** We recommend removing this section. With the specific RBC language removed, the section loses meaning: "a" is unnecessary and "b" is redundant with other sections of the VM which allow for materiality considerations (language in VM-20 is likely better for this purpose and should be used consistently).
- Commented [VM2244R43]:** Subgroup agrees with removing this section.
- Commented [CD45]:** Suggest eliminated "policies or", since customarily, annuities are "contracts"
- Commented [VM2246R45]:** Edits to address this comment will be reflected in next exposure
- Commented [CD47]:** This is not in VM-21, and my suggestion would be to delete this
- Commented [VM2248R47]:** Subgroup agrees with removing
- Commented [X49]:** Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly ... [1]
- Commented [VM2250R49]:** Subgroup agrees with removing this section.
- Commented [CD51]:** should this same change also be made to VM-21?
- Commented [VM2252R51]:** Edits to address this comment will be reflected in next exposure
- Commented [X53]:** The revised language "sudden and significant levels of withdrawal and surrenders" replaced ... [2]
- Commented [VM2254R53]:** Subgroup in favor of retaining VM-21 language of "run on the bank".

- iii. Major breakthroughs in life extension technology that have not yet fundamentally altered recently observed mortality experience.
  - iv. Significant future reserve increases as an unfavorable scenario is realized.
- c. General business risks
- i. Deterioration of reputation.
  - ii. Future changes in anticipated experience (reparameterization in the case of stochastic processes), which would be triggered if and when adverse modeled outcomes were to actually occur.
  - iii. Poor management performance.
  - iv. The expense risks associated with fluctuating amounts of new business.
  - v. Risks associated with future economic viability of the company.
  - vi. Moral hazards.
  - vii. Fraud and theft.
  - viii. Operational.
  - ix. Litigation.

D. Specific Definitions for VM-22

**Buffer Annuity**

Interchangeable term for Registered Index-Linked Annuity (RIILA). See definition for Registered Index-Linked Annuity below.

E.

- **Deferred Income Annuity (DIA)**  
 An annuity which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin one year, 13 months or later after (or from) the issue date if the contract holder survives to a predetermined future age.
- **Fixed Indexed Annuity (FIA)**  
 An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, subject to certain limits, typically with guaranteed principal.
- **Flexible Premium Deferred Annuity (FPDA)**  
 An annuity with an account value established with a premium amount but allows for additional deposits to be paid into the annuity over time, resulting in an increase to the account value. The contract also has a guaranteed interest rate during the accumulation phase and has

**Commented [X55]:** We recommend deleting the wording "fundamentally". If a breakthrough is known to have fundamentally changed expected future mortality, but is not yet significantly reflected in historical experience, why is it not reflected? Do we know about this fundamental shift for years before it is reflected? This issue also applies to the VM-21 requirement.

**Commented [VM2256R55]:** Edits to address this comment will be reflected in next exposure

**Commented [X57]:** We recommend removing the bullet "Significant future reserve increases as an unfavorable ... [3]

**Commented [VM2258R57]:** Subgroup in favor retaining language to stay consistent with VM-21.

**Commented [X59]:** List could be expanded to include operational risk and litigation risk.

**Commented [VM2260R59]:** Edits to address this comment will be reflected in next exposure

**Commented [X61]:** It seems the definitions included in this section are largely only used for the purpose of ... [4]

**Commented [VM2262R61]:** No objections from the Subgroup to an approach that is broader and focuses ... [5]

**Commented [CD63]:** The format of this Definitions section is inconsistent with other parts of the VM. In ... [6]

**Commented [VM2264R63]:** Edits to address this comment will be reflected in next exposure

**Commented [X65]:** The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity ... [7]

**Commented [VM2266R65]:** Edits to address this comment will be reflected in next exposure

**Commented [X67]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guide ... [8]

**Commented [VM2268R67]:** Edits to address this comment will be reflected in next exposure

**Commented [X69]:** The wording "after (or from)" the issue date used in the DIA and SPIA definitions is conf ... [9]

**Commented [VM2270R69]:** Edits to address this comment will be reflected in next exposure

**Commented [X71]:** Is "typically" intended to be a requirement in the definition? That is, to qualify as F ... [10]

**Commented [VM2272R71]:** Edits to address this comment will be reflected in next exposure

**Commented [CD73]:** insert: "subject to certain limits,"

**Commented [VM2274R73]:** Edits to address this comment will be reflected in next exposure

**Commented [X75]:** The definition of FIA describes the account value as typically with guaranteed principal. ... [11]

**Commented [VM2276R75]:** Edits to address this comment will be reflected in next exposure

guaranteed mortality and interest rates applicable at the time of conversion to the payout phase.

- **Funding Agreement**

A contract issued to an institutional investor (domestic and international non-qualified fixed income investors) that provides fixed or floating interest rate guarantees.

- **Guaranteed Investment Contract (GIC)**

Insurance contract typically issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.

- **Index Credit Hedge Margin**

A margin capturing the risk of inefficiencies in the company's hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions.

- **Index Credit**

Any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to contract policy values that is linked to an index or indices. Amounts credited to the contract policy resulting from a floor on an index account are included.

- **Index Crediting Strategy**

The strategy defined in a contract to determine index credits for a contract. This refers to For example, this may refer to underlying index, index parameters, date, timing, performance triggers, and other elements of the crediting method.

- **Index Parameter**

Cap, floor, participation rate, spreads, or other features describing how the contract utilizes the index.

- **Longevity Reinsurance**

An agreement, typically a reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.

- Typically, the reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these

Commented [CD77]: should be "contract"

Commented [VM2278R77]: Edits to address this comment will be reflected in next exposure

Commented [CD79]: should be "contract"

Commented [VM2280R79]: Edits to address this comment will be reflected in next exposure

Commented [X81]: We would suggest adding performance trigger to the list, along with other potential crediting methods; alternatively, the definition could specify that the crediting methods listed are examples only

Commented [VM2282R81]: Edits to address this comment will be reflected in next exposure

Commented [X83]: The definition states that "Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 63 are not included in this definition". Why is this the case and does this imply that longevity swaps are not within the scope of VM-22? Recommend adding to the out of scope list in "2.A. Scope" if that is the case. Clarification would also be helpful on what guidance should be used for these agreements if out of scope for VM-22. Further, we would suggest removing "typically" from the definition

Commented [VM2284R83]: Academy will follow-up with proposed revisions to the definition of Longevity Reinsurance.

Commented [VM2285]: New Jersey comment refers due to future premiums, longevity reinsurance may generate negative reserves, which can be used to eliminate or reduce other immediate annuity reserves. Suggest using net premium methodology, solving for a k-factor at issue to solve for  $PV(\text{premiums}) = PV(\text{benefits})$

Commented [VM2286R85]: VM-22 Subgroup has exposed a proposal from NJ to address this issue.

agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.

- Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular, contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.
- **Market Value Adjustment (MVA) Annuity**  
 An annuity with an account value where withdrawals and full surrenders are subject to adjustments based on interest rates or index returns at the time of withdrawal/surrender. There could be ceilings and floors on the amount of the market-value adjustment.
- **Modified Guaranteed Annuity (MGA)**  
 A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account and the value of which are guaranteed if held for specified periods of time. [The contract contains nonforfeiture values and death benefits that are based upon a market-value adjustment formula if held for shorter periods.]
- **Multi-iple Year Guaranteed Annuity (MYGA)**  
 A type of fixed non-variable annuity that provides a pre-determined and contractually guaranteed interest rate for specified periods of time, after which there is typically an annual reset or renewal of a multiple year guarantee period.
- **Pension Risk Transfer (PRT) Annuity**  
 An annuity, typically a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).
- **Registered Index-Linked Annuity (RILA)**  
 An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to a n external index, similar to a Fixed Indexed Annuity, but with downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.
- **Single Premium Immediate Annuity (SPIA)**  
 An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months one year after (or from) the issuedateissue date.

**Commented [X87]:** We recommend editing the definition as follows "A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account..."

**Commented [VM2288R87]:** Edits to address this comment will be reflected in next exposure

**Commented [X89]:** To clarify definition of MGA, recommend adding "death benefits"

**Commented [VM2290R89]:** Edits to address this comment will be reflected in next exposure

**Commented [CD91]:** should this be "Multi-Year" instead of "Multiple Year"? The former is the more commonly used term for MYGA

**Commented [VM2292R91]:** Edits to address this comment will be reflected in next exposure

**Commented [CD93]:** "fixed annuity" is not defined. Is it better to change all instances of "fixed annuity" to "non-variable annuity" to be consistent with the terminology introduced in Section 1.A (and to be aligned with the actual VM-22 chapter name)? An alternative could be to add a definition for "fixed annuity", with the definition of it being a "non-variable annuity"

**Commented [VM2294R93]:** Subgroup in favor of the term "non-variable annuity" instead of "fixed annuity". Changes are made consistently throughout the VM-22 draft.

**Commented [CD95]:** ok to keep this as "multiple year"

**Commented [VM2296R95]:** Edits to address this comment will be reflected in next exposure

**Commented [X97]:** Is "typically" intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance ... [12]

**Commented [VM2298R97]:** Academy will review this comment as part of revisiting the longevity reinsurance ... [13]

**Commented [X99]:** It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product ... [14]

**Commented [VM22100R99]:** ACL already following up on a proposal to address the scope and definitions, v ... [15]

**Commented [X101]:** If need to address Buffer Annuity (not sure this is needed), can add here as a subset of RILA

**Commented [VM22102R101]:** Edits to remove "Buffer Annuity" will be reflected in next exposure

**Commented [X103]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guid ... [16]

**Commented [VM22104R103]:** Edits to address this comment will be reflected in next exposure

**Commented [X105]:** The wording "after (or from)" the issue date used in the DIA and SPIA definitions is con ... [17]

**Commented [VM22106R105]:** Edits to address this comment will be reflected in next exposure

- Single Premium Deferred Annuity (SPDA)**  
 An annuity with an account value established with a single premium amount that grows with a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase. May also include cases where the premium is accepted for a limited amount of time early in the contract life, such as only in the first duration.
- Stable Value Contract**  
 A contract that provides limited investment guarantees, typically preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios typically consist of fixed income securities, which may sit in the insurer's general account, a separate account, or in a third-party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.
- Structured Settlement Contract (SSC)**  
 A contract that provides periodic benefits and is purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes. ~~Adverse mortality is typically expected for these contracts.~~
- Synthetic Guaranteed Investment Contract (Synthetic GIC)**  
 Contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the ~~contract policyholder~~ or plan trust.
- Term Certain Payout Annuity**  
 A contract issued, which offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.
- Two-Tiered Annuity**  
 A deferred annuity with two tiers of account values. One, with a higher accumulation interest rate, is only available for annuitization or death. The other typically contains a lower accumulation interest rate, and is only available upon surrender.

~~The term "cash surrender value" means, for the purposes of these requirements, the amount available to the contract holder upon surrender of the contract. Generally, it is equal to the account value less any applicable surrender charges, where the surrender charge reflects the availability of any free partial surrender options. However, for contracts where all or a portion of the amount available to the contract holder upon surrender is subject to a market value adjustment, the cash surrender value shall reflect the market value adjustment consistent with the required treatment of the underlying assets. That is, the cash surrender value shall reflect any market value adjustments where the underlying assets are reported at market value, but it shall not reflect any market value adjustments where the underlying assets are reported at book value.~~

**Commented [X107]:** Suggest striking sentence "Adverse mortality is typically expected for these contracts." from definition. Additionally, it is possible that there may be non-standard settlements.

**Commented [VM22108R107]:** Edits to address this comment will be reflected in next exposure

**Commented [CD109]:** suggest spelling out GIC first, followed by the acronym

**Commented [VM22110R109]:** Edits to address this comment will be reflected in next exposure

**Commented [CD111]:** should be "contract holder"

**Commented [VM22112R111]:** Edits to address this comment will be reflected in next exposure

**Commented [CD113]:** this definition still applies, should we keep it?

**Commented [VM22114R113]:** Comment retracted in light of "Cash Surrender Value" definition being included in VM-01

~~The term "guaranteed minimum death benefit" (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:~~

~~— increased by an amount that may be either specified by or computed from other policy or contract values; and~~

~~— has the potential to produce a contractual total amount payable on such death that exceeds the account value; or~~

~~— in the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.~~

E. Materiality

The company shall establish a standard containing the criteria for determining whether an assumption, risk factor, or other element of the principle-based valuation has a material impact on the size of the reserve. This standard shall be applied when identifying material risks.

Section 2: Scope and Effective Date

A. Scope

— Subject to the requirements of this Sections 1 to 13 of VM-22 are annuity contracts, certificates and contract features, whether group or individual, including both life contingent and term-certain-only, directly written or assumed through reinsurance issued on or after 1/1/2024, with the exception of contracts or benefits listed below.

Products out of scope include:

1. ~~Contracts or benefits that are subject to VM 21 (such as variable annuities, RILAs, buffer annuities, and structured annuities)~~
2. ~~GICs~~
3. ~~Synthetic GICs~~
4. ~~Stable Value Contracts~~
5. ~~Funding Agreements~~

Products in scope of VM-22 include ~~non-variable~~ Fixed annuities which consist of, but are not limited to, the following ~~the~~ list:

- **Account Value Based Annuities**
  1. Deferred Annuities (SPDA & FPDA)
  2. Multi-Year Guarantee Annuities (MYGA)
  3. Fixed Indexed Annuities (FIA)
  4. Market Value Adjustments (MVA)
  5. Two-tiered Annuities
  6. Guarantees/Benefits/Riders on ~~Non-Variable~~ Fixed Annuity Contracts
- **Payout Annuities**

- Commented [CD115]: this definition still applies, should we keep it?
- Commented [VM22116R115]: Subgroup recommends moving this definition to VM-01, which is now included at the end of the draft document.
- Commented [X117]: Add consistent with VM-21 Section 1.E, which was added to the 2022 VM.
- Commented [VM22118R117]: Edits to address this comment will be reflected in next exposure
- Commented [X119]: Consistent with our comment in Section 1, the language around effective date should be clear this only applies to new PBR methodology, and rates in Section 13 have a different effective date.
- Commented [VM22120R119]: Edits to address t... [18]
- Commented [X121]: We would support reworking... [23]
- Commented [VM22122R121]: ACLI will follow up... [24]
- Commented [X123]: The reserving categories for... [22]
- Commented [VM22124R123]: See NY comment... [21]
- Commented [VM22125R123]: See Equitable.com... [20]
- Commented [VM22126R123]: The VM-22 Subgr... [19]
- Commented [CD127]: suggest numbering the par... [26]
- Commented [VM22128R127]: Edits to address t... [25]
- Commented [CD129]: suggest swapping the orde... [27]
- Commented [VM22130R129]: Edits to address t... [28]
- Commented [X131]: Since buffer annuities are a s... [29]
- Commented [VM22132R131]: Edits to address t... [30]
- Commented [CD133]: this is not defined in the D... [31]
- Commented [VM22134R133]: Edits to address t... [32]
- Commented [X135]: This needs to be revised to b... [33]
- Commented [VM22136R135]: Edits to address t... [34]
- Commented [CD137]: should this be "non-variabl... [35]
- Commented [VM22138R137]: Edits to address t... [36]
- Commented [X139]: Typo. Delete extra "the".
- Commented [VM22140R139]: Edits to address t... [38]
- Commented [CD141]: grammar - delete "the"
- Commented [VM22142R141]: Edits to address t... [37]
- Commented [CD143]: should have space instead of dash
- Commented [VM22144R143]: Edits to address t... [39]
- Commented [CD145]: delete the "s" and add "Annuities"
- Commented [VM22146R145]: Edits to address t... [40]
- Commented [CD147]: should this be "Non-Variab... [41]
- Commented [VM22148R147]: Edits to address t... [42]

1. Single Premium Immediate Annuities (SPIA)
2. Deferred Income Annuities (DIA)
3. Term Certain Payout Annuities
4. Pension Risk Transfer Annuities (PRT)
5. Structured Settlement Contracts (SSC)
6. Longevity Reinsurance

Products out of scope include:

1. Contracts or benefits that are subject to VM-21 (such as variable annuities and RILAs)
2. GICs
3. Synthetic GICs
4. Stable Value Contracts
5. Funding Agreements

~~The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22.~~

B. Effective Date & Transition

Effective Date

These requirements apply for valuation dates on or after January 1, ~~2024~~2025.

**Transition**

A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-22 PBR requirements and issued during the first three years following the effective date of VM-22 PBR. ~~If a company during the three-year transition period elects to apply VM-22 PBR to a block of such business, then a company must continue to apply the requirements of VM-22 PBR for future issues of this business. Irrespective of the transition date, a company shall apply VM-22 PBR requirements to applicable blocks of business on a prospective basis starting at least three years after the effective date.~~

**Commented [CD149]:** for consistency, make plural; i.e., change to "ies"

**Commented [VM22150R149]:** Edits to address this comment will be reflected in next exposure

**Commented [X151]:** We suggest moving or deleting the sentence "The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22." from this section as it does not seem fitting here.

**Commented [VM22152R151]:** Edits to address this comment will be reflected in next exposure

**Commented [CD153]:** self-referencing "VM-22" is not necessary

**Commented [VM22154R153]:** Edits to address this comment will be reflected in next exposure

**Commented [X155]:** Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here ... [43]

**Commented [VM22156R155]:** Edits to address this comment will be reflected in next exposure

**Commented [CD157]:** again, suggest numbering the paragraphs within this section

**Commented [VM22158R157]:** Edits to address this comment will be reflected in next exposure

**Commented [X159]:** We still have a question about whether RBC factors are still at an appropriate level, ... [44]

**Commented [VM22160R159]:** Comment related to RBC

**Commented [X161]:** Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section ... [45]

**Commented [VM22162R161]:** Subgroup discussed moving current VM-22 requirements (currently Secti ... [46]

**Commented [X163]:** To be more clear, recommend adding "transition period" to "the three years".

**Commented [VM22164R163]:** Edits to address this comment will be reflected in next exposure

**Commented [X165]:** Can a company wait until the end of the transition period to start PBR, but then apply PBR ... [47]

**Commented [VM22166R165]:** Discussed with Subgroup and decided to keep the VM-22 language silent on th ... [50]

**Commented [CD167]:** Will we (or should we) allow for any early adopters (like we did for VM-21)? It would ... [49]

**Commented [VM22168R167]:** Discussed with Subgroup and decided to not have early adoption before the st ... [48]

Section 3: Reserve Methodology

A. Aggregate Reserve

The aggregate reserve for contracts falling within the scope of these requirements shall equal the ~~stochastic reserve~~SR (following the requirements of Section 4) ~~plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option,~~ less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A and VM-C.

**Guidance Note:** Contracts valued under applicable requirements in VM-A and VM-C are ones that pass the exclusion test and elect to not model PBR ~~stochastic reserves~~SRs, per the requirements in Section 3.E.

B. Impact of Reinsurance ~~Ceded~~

All components in the aggregate reserve shall be determined post-reinsurance ceded, that is net of any reinsurance cash flows arising from treaties that meet the statutory requirements that allow the treaty to be accounted for as reinsurance. A pre-reinsurance ceded reserve also needs to be determined by ignoring all reinsurance cash flows (costs and benefits) in the reserve calculation.

~~C. To Be Determined~~ The Additional Standard Projection Amount

D. The Stochastic Reserve

~~The stochastic reserve~~  
 The additional standard projection amount is determined by applying one of the two standard projection methods defined in Section 6. The same method must be used for all contracts within a group of contracts that are aggregated together to determine the reserve. The company shall elect which method they will use to determine the additional standard projection amount. The company may not change that election for a future valuation without the approval of the domiciliary commissioner.

D. The SR

1. The SR shall be determined based on asset and liability projections for the contracts falling within the scope of these requirements, excluding those contracts valued using the methodology pursuant to applicable requirements in VM-A and VM-C, over a broad range of stochastically generated projection scenarios described in Section 8 and using prudent estimate assumptions as required in Section 3. ~~GF~~ herein.
2. ~~The stochastic reserve~~SR amount for any group of contracts shall be determined as CTE70 of the scenario reserves following the requirements of Section 4.

E. The DR

~~, with the exception of~~ The DR for groups of contracts for which a company elects the Deterministic Certification Option in Section 7.E, which shall be determined as the ~~scenario reserve~~DR following the requirements of Section 4.

**Commented [X169]:** Reinstate and modify later as needed - SPA being developed in separate workflow.

**Commented [VM22170R169]:** To address SPA later in the VM-22 development process.

**Commented [X171]:** One of the most confused parts of the draft was referring to a DR as the SR for certain contracts. Need to handle and refer to separately.

**Commented [VM22172R171]:** Edits to address this comment will be reflected in next exposure

**Commented [X173]:** Guidance is needed on how a pre-reinsurance reserve is to be determined.

**Commented [VM22174R173]:** ACLI will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure

**Commented [X175]:** Reinstate and modify later as needed - SPA being developed in separate workflow.

**Commented [VM22176R175]:** Edits to address this comment will be reflected in next exposure

**Commented [CD177]:** Should this be Section 3.G?

**Commented [VM22178R177]:** Edits to address this comment will be reflected in next exposure

**Commented [X179]:** Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

**Commented [VM22180R179]:** Will replace "scenario reserve" with "deterministic reserve".



3. The reserve may be determined in aggregate across various groups of contracts within each Reserving Category as a single model segment when determining the stochastic reserve if the business and risks are not managed separately or are part of the same integrated risk management program. Aggregation is permitted if a resulting group of contracts (or model segment) follows the listed principles:SR.

#### F. Aggregation of Contracts for the DR and SR

Groups of contracts within different Reserving Categories may not be aggregated together in determining the SR or DR. For the purposes of VM-22, Reserving Categories are classified as the following:

- a. The “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities:
  - i. Immediate annuity contracts;
  - ii. Deferred income annuity contracts;
  - iii. Structured settlements in payout or deferred status;
  - iv. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
  - v. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
  - vi. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;
  - vii. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
  - viii. Pension Risk Transfer Annuities; and
  - ix. Longevity Reinsurance.

**Drafting Note:** Additional feedback is welcome for whether to permit optionality for categorizing guaranteed living benefit contracts with depleted fund value as either in the payout or accumulation reserving category.

**Commented [VM22181]:** include in deferred annuity with depleted fund value in payout reserving category or accumulation reserving category.

**Commented [VM22182R181]:** The Subgroup has elected to leave these contracts in the payout annuity reserving category, but is adding to a drafting note to welcome feedback.

b. The “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category”.

~~Using prudent actuarial judgement, consider the following elements when aggregating groups of contracts: whether groups of contracts are part of the same portfolio (or different portfolios that interact), same integrated risk management system, administered/managed together~~

4. Do not aggregate groups of contracts for which the company elects to use the Deterministic Certification Option in Section 7.E with any groups of contracts that do not use such option.

54. To the extent that these limits on the aggregation result results in more than one model segment, the stochastic reserve SR aggregate reserve shall equal the sum of the stochastic reserve SR amounts computed for each model segment and scenario reserve DR amounts computed for each model segment for which the company elects to use the Deterministic Certification Option in Section 7.E.

G. Stochastic Exclusion Test

1. To the extent that certain groups of contracts pass one of the defined the stochastic exclusion tests in Section 7.B, these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A and VM-C, with the statutory maximum valuation rate for immediate annuities specified in and Section 13.

a. **Guidance Note:** The intention of contracts that pass the stochastic exclusion test is to provide the option to value contracts under VM-A and VM-C. This may apply to pre-PBR CARVM requirements in accordance with Actuarial Guideline XXXIII (AG33) methodology with type A, B, C rates for SPIAs issued before 2018; AG33 methodology with pre-PBR VM 22 rates for SPIAs issued on/after 2018; Actuarial Guideline XXXV (AG35) pre-PBR methodology for Fixed Indexed Annuities; and AG33 methodology (with interest rate updates for modernization initiatives on new contracts) for non-SPIAs.

2. For dividend-paying contracts, a dividend liability shall be established following requirements in VM-A and VM-C, as described above, for the base contract.

2.3. The approach for grouping contracts company may not group together contract types with significantly different risk profiles when performing the exclusion tests should follow the same principles that underlie the aggregation approach for model segments discussed for Stochastic Reserves in Section D above test.

H. Allocation of the Aggregate Reserve to Contracts

The aggregate reserve shall be allocated to the contracts falling within the scope of these requirements using the method outlined in Section 4.13, with the exception of contract following Section 3.E which are to be calculated on a seriatim basis.

I. Prudent Estimate Assumptions

1. With respect to the Stochastic Reserve SR in Section 3.D, the company shall establish the prudent estimate assumption for each risk factor in compliance with the requirements

**Commented [X183]:** The term "Deterministic Certification Option" may be confusing, as there is no "deterministic" reserve, unlike VM-20. We recommend consideration of an alternative term. In addition, we recommend changing the phrasing to "with the exception of groups of contracts for which a company elects the [Deterministic Certification Option], following the requirements of Section 7.E."

**Commented [VM22184R183]:** Now that deterministic reserve exists, the ACLI is fine retaining "Deterministic Certification Option"

**Commented [X185]:** Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

**Commented [VM22186R185]:** Will replace "scenario reserve" with "deterministic reserve".

**Commented [CD187]:** suggest expanding header ... [51]

**Commented [VM22188R187]:** No objections from ... [52]

**Commented [X189]:** Seems to imply that only SPI ... [53]

**Commented [VM22190R189]:** Edits to address t ... [54]

**Commented [CD191]:** Suggest rewording to just s ... [55]

**Commented [VM22192R191]:** Edits to address t ... [56]

**Commented [X193]:** We believe this guidance not ... [57]

**Commented [VM22194R193]:** No objections to ... [58]

**Commented [X195]:** The statement in this sectio ... [59]

**Commented [VM22196R195]:** Subgroup agreed ... [60]

**Commented [X197]:** This section seems to indiv ... [61]

**Commented [VM22198R197]:** Subgroup voted t ... [62]

**Commented [CD199]:** for clarity, change this refe ... [63]

**Commented [VM22200R199]:** Edits to address t ... [64]

**Commented [CD201]:** again, suggest rewording t ... [65]

**Commented [VM22202R201]:** Edits to address t ... [66]

**Commented [X203]:** Based on VM-20 language. ... [67]

**Commented [VM22204R203]:** Subgroup agreed ... [67]

**Commented [X205]:** Either in this item or in Secti ... [68]

**Commented [VM22206R205]:** Edits to address t ... [69]

**Commented [X207]:** This sub-section seems more ... [70]

**Commented [VM22208R207]:** The Subgroup dec ... [71]

**Commented [CD209]:** VM-21 Section 3.H on ... [72]

**Commented [VM22210R209]:** Subgroup decided ... [73]

**Commented [CD211]:** should this be "Section 3.D"? ... [73]

**Commented [VM22212R211]:** Edits to address t ... [74]

in Section 12 of Model #820 and must periodically ~~at least every 3 years~~ review and update the assumptions as appropriate in accordance with these requirements.

**Drafting Note:** Consider replacing “periodically” with “at least every 3 years in the paragraph above upon adoption of a similar APF for VM-20/VM-21.

2. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. ~~If the results of statistical testing or other testing the review indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary (Company) shall set a new, adequate, anticipated experience assumption for the factor.~~

3. To determine the prudent estimate assumptions, the ~~stochastic reserve~~ SR shall also follow the requirements in Sections 4 and ~~general assumptions including Section 9~~ for asset assumptions, Section 10 for ~~contract policy holder~~ behavior assumptions, and Section 11 for mortality assumptions, and Section 12 for general guidance and expense assumptions.

**J. Approximations, Simplifications, and Modeling Efficiency Techniques**

A company may use simplifications, approximations, and modeling efficiency techniques to calculate the SR and/or the additional standard projection amount required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations, and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

**Guidance Note:**

Examples of modeling efficiency techniques include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques or other similar simplifications.

There are multiple ways of providing the demonstration required by Section 3.H. The complexity of the demonstration depends upon the simplifications, approximations or modeling efficiency techniques used. Examples include, but are not limited to:

1. Rounding at a transactional level in a direction that is clearly and consistently conservative or is clearly and consistently unbiased with an obviously immaterial impact on the result (e.g., rounding to the nearest dollar) would satisfy 3.H without needing a demonstration. However, rounding to too few significant digits relative to the quantity being rounded, even in an unbiased way, may be material and in that event, the company may need to provide a demonstration that the rounding would not produce a material understatement of the reserve.

**Commented [X213]:** Recommend to periodically review at least every three years.

**Commented [VM22214R213]:** Subgroup decided to adopt this wording if a similar APF is adopted for VM-20/VM-21.

**Commented [CD215]:** Should this be “the company... shall”, rather than the “qualified actuary... shall”? Not sure why this particular task falls on the QA, when “the company” generally has responsibility for PBR and, in the subsection directly before this one, the company is assigned the task of establishing prudent estimate assumptions.

**Commented [VM22216R215]:** Edits to address this comment will be reflected in next exposure

**Commented [X217]:** Suggest replacing “If the results of statistical testing or other testing” with “If the results of the review” to simplify language and avoid possible confusion.

**Commented [VM22218R217]:** Edits to address this comment will be reflected in next exposure

**Commented [X219]:** Recommend replacing “the qualified actuary” with “the Company” consistent with general PBR requirements that the company set assumptions.

**Commented [VM22220R219]:** Edits to address this comment will be reflected in next exposure

**Commented [CD221]:** should this be “the company”? See prior comment.

**Commented [VM22222R221]:** Edits to address this comment will be reflected in next exposure

**Commented [CD223]:** should this be “contract holder”?

**Commented [VM22224R223]:** Edits to address this comment will be reflected in next exposure

**Commented [X225]:** Need a new section for the general assumptions, including specifics for the expense assumptions. APF currently exposed for VM-21. We should be consistent with any edits.

**Commented [VM22226R225]:** Edits to address this comment will be reflected in next exposure

2. A brute force demonstration involves calculating the minimum reserve both with and without the simplification, approximation or modeling efficiency technique, and making a direct comparison between the resulting reserve. Regardless of the specific simplification, approximation or modeling efficiency technique used, brute force demonstrations always satisfy the requirements of Section 3.H.

3. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters and providing a detailed demonstration of why it did not understate the reserve by a material amount and the expected value of the reserve would not be less than the expected value of the reserve that would otherwise be calculated. This demonstration may be a theoretical, statistical or mathematical argument establishing, to the satisfaction of the insurance commissioner, general bounds on the potential deviation in the reserve estimate rather than a brute force demonstration.

~~Justify the use of randomly sampling withdrawal ages for each contract instead of following the exact prescribed WDCM method by demonstrating that the random sampling method is materially equivalent to the exact prescribed approach, and the simplification does not materially reduce the Additional Standard Projection Amount and the final reported reserve. In particular, the company should demonstrate that the statistical variability of the results based on the random sampling approach is immaterial by testing different random sets, e.g., if randomly selecting a withdrawal age for each contract, the probability distribution of the withdrawal age should be stable and not vary significantly when using different random number sets.~~

**Drafting Note:** Add back in the WDCM method example in the above guidance note if VM-22 uses this method for the SPA calculation.

**Commented [X227]:** Specific example should be tailored based on the SPA developed.

**Commented [VM22228R227]:** Delete for now and add back in if the WDCM method is used for the VM-22 SPA calculation.

**Commented [X229]:** Added consistent with VM-21 Section 3.H, which was added to the 2022 VM.

**Commented [VM22230R229]:** Edits to address this comment will be reflected in next exposure

Section 4: Determination of ~~Stochastic Reserve~~ SR

A. Projection of Accumulated Deficiencies

1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9.D. The company shall project cash flows including the following:

a. ~~Revenues~~ Gross premium received by the company including gross premiums received from the ~~policyholder~~ policyholder/contract holder (including any due premiums as of the projected start date).

**Guidance Note:** If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.

b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses).

All material benefits projected to be paid to ~~contract~~ policyholders including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

**Guidance Note:** Amounts charged to account values on general account business are not revenue; examples include rider charges and expense charges.

a-c. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.

b-d. Insurance company expenses (including overhead and investment maintenance expense), commissions, contractual fees and charges, and revenue sharing income received by the company (net of applicable expenses) other acquisition expenses associated with business in force as of the valuation date.

e-e. Net Cash flows associated with any reinsurance.

d-f. Cash flows from hedging instruments as described in Section 4.A.4.

**Commented [NJ231]:** Consider including stochastic mortality in the SR for longevity reinsurance

**Commented [VM22232R231]:** Ported over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk for reinsurance liability assumptions. New language is included in Section 5.A.2.e, including a guidance note that explicitly mentions longevity reinsurance.

**Commented [CD233]:** Should this refer to Section 4 and Section 9?

**Commented [VM22234R233]:** Edits to address this comment will be reflected in next exposure

**Commented [CD235]:** "contract holder"?

**Commented [VM22236R235]:** Edits to address this comment will be reflected in next exposure

**Commented [X237]:** If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below. ... [75]

**Commented [VM22238R237]:** Edits to address this comment will be reflected in next exposure

**Commented [CD239]:** "contract holders"

**Commented [VM22240R239]:** Edits to address this comment will be reflected in next exposure

**Commented [X241]:** The purpose of this guidance note is not clear as these charges would be reflected in the ... [76]

**Commented [VM22242R241]:** Edits to address this comment will be reflected in next exposure

**Commented [CD243]:** should this be Section 10.I?

**Commented [VM22244R243]:** Edits to address this comment will be reflected in next exposure

**Commented [X245]:** Changed investment expense to be maintenance expense so that it does not repeat what ... [77]

**Commented [VM22246R245]:** Edits to address this comment will be reflected in next exposure

**Commented [X247]:** Added acquisition expenses.

**Commented [VM22248R247]:** Edits to address this comment will be reflected in next exposure

**Commented [X249]:** Take out the revenues that covers the investment expenses and added a separate bullet ... [78]

**Commented [VM22250R249]:** Edits to address this comment will be reflected in next exposure

**Commented [CD251]:** Both net and gross cash flows have to be considered, so I don't agree with the addi ... [79]

**Commented [VM22252R251]:** Edits to address this comment will be reflected in next exposure

e.g. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.

f.h. If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.

**Guidance Note:** Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.1.b are before consideration of policy loans), less additional policy loan principal (but excluding policy loan interest that is added to the policy loan principal balance).

Guidance Note: Section 4.A.1 requires market value adjustments (MVAs) on liability cash flows to be reflected because in a cash flow model, assets are assumed to be liquidated at market value to cover the cash outflow of the cash surrender; therefore, inclusion of the market value adjustment aligns the asset and liability cash flows. This may differ from the treatment of MVAs in the definition of cash surrender value (Section 1.D), which defines the statutory reserve floor for which the values must be aligned with the annual statement value of the assets.

## 2. Grouping of Index Crediting Strategies

Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy. In assigning each index crediting strategy to a grouping for projection purposes, the fundamental characteristics of the index crediting strategy shall be reflected, and the parameters shall have the appropriate relationship to the stochastically generated projection scenarios described in Section 8. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

Index accounts sharing similar index crediting strategies may also be grouped for modeling to an appropriately crafted proxy strategy normally expressed as a linear combination of recognized market indices, sub-indices or funds, in order to develop the investment return paths and associated interest crediting. Each index crediting strategy's specific risk characteristics, associated index parameters, and relationship to the stochastically generated scenarios in Section 8 should be considered before grouping or assigning to a proxy strategy. Grouping and/or development of a proxy strategy may not be done in a manner that intentionally understates the resulting reserve.

## 3. Model Cells

Projections may be performed for each contract in force on the date of valuation or by assigning contracts into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Assigning contracts to model cells may not be done in a manner that intentionally understates the resulting reserve.

**Commented [X253]:** Guidance Note regarding the market value adjustment seems still applies and should not be deleted. We reinstated the guidance note.

**Commented [VM22254R253]:** Subgroup ultimately decided to remove the guidance note, since it applies more to VM-21 products, is implied when assets are held at market value, and the reference to Section 4.A.1 is no longer applicable.

**Commented [X255]:** Suggest editing the first sentence to note scope is FIAs and to avoid confusion regarding the term "investment guideline" as follows: "Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy."

**Commented [VM22256R255]:** Edits to address this comment will be reflected in next exposure

4. Modeling of Hedges

a. For a company that does not have a future hedging program strategy tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:

i. The company shall not consider the cash flows from any future hedge purchases or any rebalancing of existing hedge assets in its modeling, since they are not included in the company's investment strategy supporting the contracts.

ii. Existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the starting assets. The hedge assets may then be considered in one of two ways:

- a) Include the asset cash flows from any contractual payments and maturity values in the projection model; or
- b) No hedge positions in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

b. For a company that has one or more a future hedging strategies program tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:

i. For a hedging program with hedge payoffs that offset interest credits associated with indexed interest strategies (indexed interest credits):

a) In modeling cash flows, the company shall include the cash flows from future hedge purchases or any rebalancing of existing hedge assets that are intended solely to offset interest credits to policyholders/contract holders.

b) Existing hedging instruments that are currently held by the company for this purpose offsetting the indexed credits in support of the contracts falling under the scope of these requirements shall be included in the starting assets. Existing hedging instruments that are currently held by the company not for any other purpose offsetting the indexed credits should be modeled consistently with the requirements of Section 4.A.4.a.ii.

**Commented [X257]:** Given that Section 9 covers hedging, we would suggest considering moving parts of Section 4.A.4 to that section.

**Commented [VM22258R257]:** The Subgroup is open to edits on restructuring VM-22 to move more detailed hedging requirements to Section 9. Will look for any comments during the exposure.

**Commented [X259]:** VM-22 took out the CDHS requirement and replaced it with "future hedging program". Future hedging should not materially reduce reserves or TAR if it is not well documented. The hedging DG is currently working on this for VM-20/VM-21. We will work with VM-22 subgroup to edit VM-22 accordingly.

**Commented [VM22260R259]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X261]:** Suggest rewording "Future hedging program" to "hedging program with future transactions" to avoid ambiguity.

**Commented [VM22262R261]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD263]:** The word "future" to describe the "hedging program" here is confusing. What about current hedging programs with expected future hedge purchases? Why not just say "hedging program"? Also, I wanted to note that removing the concept of CDHS creates inconsistency with both VM-20 and VM-21. Why not retain it?

**Commented [VM22264R263]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD265]:** same comment as above, about the word "future" being confusing

**Commented [VM22266R265]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD267]:** "contract holders"

**Commented [VM22268R267]:** Edits to address this comment will be reflected in next exposure

**Commented [X269]:** "Any other purpose" in the last sentence seems overly broad and should be narrowed.

**Commented [VM22270R269]:** Edits to address this comment will be reflected in next exposure

**Commented [X271]:** Specify "for this purpose" as "for offsetting the indexed credits", specify "for any other purposes" as "not for offsetting the indexed credits".

**Commented [VM22272R271]:** Edits to address this comment will be reflected in next exposure

c) An Index Credit Hedge Margin for these hedge instruments shall be reflected by reducing index interest credit hedge payoffs by a margin multiple that shall be justified by sufficient and credible company experience and be no less than [X%] multiplicatively of the interest credited. This margin is intended to cover sources of potential error due the hedging itself and the ability for the company to accurately model it. In the absence of sufficient and credible company experience, a margin of [Y%] shall be assumed. There is no cap on the index credit hedge margin if company experience indicates actual error is greater than [Y%]. It is permissible to substitute stress-testing for sufficient and credible experience if such stress-testing comprehensively considers a robust range of future market conditions.

ii. For a company with any future hedging strategies that hedges any contractual obligation or risks other than indexed interest credits, the detailed requirements for the modeling of hedges are defined in Section 9. The following requirements do not supersede the detailed requirements.

a) The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the projections used in the determination of the stochastic reserve SR.

b) The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future. Because models do not always accurately portray the results of hedge programs, the company shall, through back-testing and other means, assess the accuracy of the hedge modeling. The company shall determine a stochastic reserve SR as the weighted average of two CTE values; first, a CTE70 (“best efforts”) representing the company’s projection of all of the hedge cash flows, including future hedge purchases, and a second CTE70 (“adjusted”) which shall use only hedge assets held by the company on the valuation date and only future hedge purchases associated with indexed interest credited. These are discussed in greater detail in Section 9. The SR shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E)I determined following the guidance of Section 9.C.4.

c) Consistent with Section 4.A.4.b.i., if the company has an indexed credit hedging program, the index credit hedge margin for instruments associated with indexed interest credited shall be reflected by reducing hedge payoffs by a margin multiple as defined in Section 4.A.4.b.i.c., in both the “best efforts” run and the “adjusted” run.

**Commented [X273]:** We believe the company should determine the appropriate margin based on the demonstration of effectiveness. Any guardrails on these undetermined values should be minimal, including as low as 0, subject to the appropriate demonstration of effectiveness. Further, we believe that documentation of effective product management should be contemplated in addition to historical effectiveness.

**Commented [VM22274R273]:** Subgroup agreed to revisit this discussion after field testing.

**Commented [CD275]:** clarify verbiage by saying "hedge instruments" or "derivative instruments"

**Commented [VM22276R275]:** Edits to address this comment will be reflected in next exposure

**Commented [X277]:** It is not clear how the stress testing can be used to support the index credit hedge margin. It is a test of the modeled strategy not actual performance and does not reflect any model error. We suggest that both back testing and stress testing be required and elaborated further:

Clearly specify method and metrics used for the back testing with focus on all available recent relevant history, not limited to 12 months  
 Recommend defined stress periods for stress testing, e.g., 2008 financial crisis, 2020 COVID impaired market conditions.

**Commented [X278R277]:** We will repeat the comment from our first letter: "Regarding hedge breakage expense assumptions, are both sources of error reflected here - error in the hedging itself, and error in the ability to accurately model it? Should we be separately considering the two limitations to make sure they are both clear: 1) the real-world hedging error and 2) the modeling error in reflecting the future hedging? Current error factor discussions seem muddled."

**Commented [VM22279R277]:** The Subgroup decided to A) Remove the reference to stress testing and B) Add wording to clarify the hedging margin covers both real-world hedging error and modeling error.

**Commented [X280]:** Again, need to coordinate with Hedging DG.

**Commented [VM22281R280]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X282]:** Margins are discussed in a different section, so recommend deleting.

**Commented [VM22283R282]:** Subgroup is open to receiving edits on the upcoming exposure to move the indexed credit hedging program margin requirements to a different section.

**Commented [X284]:** Edits were made to provide context and clarification for the requirements.

**Commented [VM22285R284]:** Edits to address this comment will be reflected in next exposure



- d) The use of products not falling under the scope of these VM-22 PBR Section 1 through 13 requirements (e.g., variable annuities) (e.g., equity indexed annuities) as a hedge shall not be recognized in the determination of accumulated deficiencies.

**Guidance Note:** Section 4.A.4.b.i is intended to address common situations for products with index crediting strategies where the company only hedges index credits or clearly separates index credit hedging from other hedging. In this case the hedge positions are considered similarly to other fixed income assets supporting the contracts, and a margin is reflected rather than modeling using a CTE70 adjusted run with no future hedge purchases. If a company has a more comprehensive hedge strategy combining index credits, guaranteed benefit, and other risks (e.g., full fair value or economic hedging), an appropriate and documented bifurcation method should be used in the application of sections 4.A.4.b.i and 4.A.4.b.ii above for the hedge modeling and justification. Such bifurcation methods may quantify the specific risk exposure attributable to index credit liabilities versus other liabilities such as guaranteed living benefits, and apply such for the basis for allocation.

**Guidance Note:** The requirements of Section 4.A.4 govern the determination of reserves for annuity contracts and do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

5. Revenue Sharing

If applicable, projections of accumulated deficiencies may include income from projected future revenue sharing, net of applicable projected expenses (net revenue-sharing income) if each of the following requirements set forth in VM-21 Sections 4.A.5.a through 4.A.5.f are met.

6. Length of Projections

Projections of accumulated deficiencies shall be run for as many future years as needed so that no materially greater reserve value would result from longer projection periods. Obligations remain at the end of the projection periods. Company can choose to run a shorter projection period but not shorter than 20 years and include the present value of the terminal benefits and expenses in the accumulated deficiency calculation.

7. Interest Maintenance Reserve (IMR)

The IMR shall be handled consistently with the treatment in the company's cash flow testing, and the amounts should be adjusted to a pre-tax basis.

B. Determination of Scenario Reserve

1. For a given scenario, the scenario reserve shall be determined using one of two methods described below:

- a) The starting asset amount plus the greatest present value, as of the projection start date, of the projected accumulated deficiencies; or

**Commented [X286]:** Clarify that "these requirements" should be specified as "VM-22 PBR requirements". Again, we suggest reconsidering the use of "VM-23", though.

**Commented [VM22287R286]:** Edits to address this comment will be reflected in next exposure

**Commented [CD288]:** it might be helpful to keep the parenthetical statement, with "variable annuities" as the example

**Commented [VM22289R288]:** Edits to address this comment will be reflected in next exposure

**Commented [X290]:** Unclear why Revenue Sharing is considered for non-variable products, can probably delete.

**Commented [VM22291R290]:** Decided to keep the reference to revenue sharing for now, just in case.

**Commented [X292]:** Clarify that for revenue sharing, the entire subsection of VM-21 Section 4.A.5 applies.

**Commented [VM22293R292]:** Edits to address this comment will be reflected in next exposure

**Commented [CD294]:** The "requirements are met" list is only in Section 4.A.5.a. Was the intent also to define the amount of net revenue-sharing income allowed in the projections? If so, will need to add verbiage to reference VM-21 Section 4.A.5.a through 4.A.5.f.

**Commented [VM22295R294]:** Edits to address this comment will be reflected in next exposure

**Commented [X296]:** We recommend that the projection period requirement be in line with that of VM-20. Instead of meeting the immateriality requirement, calculate the present value of the terminal benefits and expenses and include it in the accumulated deficiency calculation.

**Commented [VM22297R296]:** The Subgroup agreed with keeping the edit in the first sentence to be consistent with VM-20. However, the Subgroup decided to remove the second sentence, now that there is an estimations, simplifications, and approximations section in the latest VM-22 draft.

**Commented [VM22298]:** See Bill Wilton's comment letter, expressing opposition to inclusion of pre-tax IMR.

**Commented [VM22299R298]:** Will refer to LATF

**Commented [CD300]:** should we consider these changes to VM-21 as well, for consistency?

**Commented [VM22301R300]:** Edits to address this comment will be reflected in next exposure

**Commented [X302]:** Section does not specify what the reserve floor shall be (if any) for contracts without cash surrender value.

**Commented [VM22303R302]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may ... [80]

**Guidance Note:** The greatest present value of accumulated deficiencies can be negative.

- b) The direct iteration method, where the scenario reserve is determined by solving for the amount of starting assets which, when projected along with all contract cash flows, result in the defeasement of all projected future benefits and expenses at the end of the projection horizon with no positive accumulated deficiencies at the end of any projection year during the projection period.

The scenario reserve for any given scenario shall not be less than the cash surrender value (with any contractual market value adjustments) in aggregate on the valuation date for the group of contracts modeled in the projection.

2. Discount Rates

In determining the scenario reserve, unless using the direct iteration method pursuant to Section 4.B.1.b, the accumulated deficiencies shall be discounted at the NAER on additional assets, as defined in Section 4.B.3.

3. Determination of NAER on Additional Invested Asset Portfolio

- a. The additional invested asset portfolio for a scenario is a portfolio of general account assets as of the valuation date, outside of the starting asset portfolio, that is required in that projection scenario so that the projection would not have a positive accumulated deficiency at the end of any projection year. This portfolio may include only (i) General Account assets available to the company on the valuation date that do not constitute part of the starting asset portfolio; and (ii) cash assets.

**Guidance Note:**

Additional invested assets should be selected in a manner such that if the starting asset portfolio were revised to include the additional invested assets, the projection would not be expected to experience any positive accumulated deficiencies at the end of any projection year.

It is assumed that the accumulated deficiencies for this scenario projection are known.

- b. To determine the NAER on additional invested assets for a given scenario:
  - i. Project the additional invested asset portfolio as of the valuation date to the end of the projection period,
    - a) Investing any cash in the portfolio and reinvesting all investment proceeds using the company's investment policy.
    - b) Excluding any liability cash flows.

**Commented [X304]:** For products that do not have a cash surrender value, it is recommended that VM-22 use a "working reserve" concept, similar to VM-21 Section 3.1.1.1 requirement. Otherwise, there will be an issue aggregated with and without CSV.

**Commented [VM22305R304]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Commented [X306]:** For products with market value adjustment, needs to be floored at cash surrender value with MVA.

**Commented [VM22307R306]:** Discussed on 8/24 call, and no objections to adding this language. However, multiple parties followed-up subsequent of the call, with a request to revisit whether it is appropriate to apply the MVA to the cash surrender value floor.

**Commented [X308]:** We believe that assets held in the separate account with performance not impacting policyholder benefits should be modeled consistent with how the business is managed.

**Commented [VM22309R308]:** ACLI will consider whether to propose potential language related to this comment for the next exposure

- c) Incorporating the appropriate returns, defaults and investment expenses for the given scenario.
- ii. If the value of the projected additional invested asset portfolio does not equal or exceed the accumulated deficiencies at the end of each projection year for the scenario, increase the size of the initial additional invested asset portfolio as of the valuation date, and repeat the preceding step.
- iii. Determine a vector of annual earned rates that replicates the growth in the additional invested asset portfolio from the valuation date to the end of the projection period for the scenario. This vector will be the NAER for the given scenario.
- iv. ~~If the depletion of assets within the projection results contain any unreasonably extremely high negative or positive NAER upon borrowing due to the depletion of assets in the denominator, the NAER shall may be reset to a more appropriate discount rate, which may be carried out by imposing upper/lower limits or by using another approach, subject to actuarial judgement, that is appropriately prudent for statutory valuation the assumed cost of borrowing associated with each projected time period, in accordance with Section 4.D.3.e, as a safe harbor.~~

**Guidance Note:** There are multiple ways to select the additional invested asset portfolio at the valuation date. Similarly, there are multiple ways to determine the earned rate vector. The company shall be consistent in its choice of methods, from one valuation to the next.

C. Projection Scenarios

1. Number of Scenarios

The number of scenarios for which the scenario reserve shall be computed shall be the responsibility of the company, and it shall be considered to be sufficient if any resulting understatement in the ~~stochastic reserve~~ SR, as compared with that resulting from running additional scenarios, is not material.

2. Economic Scenario Generation

Treasury Department interest rate curves, as well as investment return paths for index funds, equities, and fixed income assets shall be determined on a stochastic basis using the methodology described in Section 8. If the company uses a proprietary generator to develop scenarios, the company shall demonstrate that the resulting scenarios meet the requirements described in Section 8.

D. Projection of Assets

1. Starting Asset Amount

- a. For the projections of accumulated deficiencies, the value of assets at the start of the projection shall be set equal to the approximate value of statutory reserves at

**Commented [X310]:** The wording "unreasonably high" is not clear or appropriate. Recommend this requirement be revised as part of a holistic fix to address extreme outliers in NAER both on the low and high side to handle anomalies for all of VM-20, VM-21, and VM-22. Some upper/lower cutoffs could be used that depend on scenario returns.

**Commented [VM22311R310]:** No objections to new proposed language to change wording from "unreasonably high" to "extreme" and reflecting positive or negative discount rates.

**Commented [CD312]:** "unreasonably high" is not well defined. Also, do we need to consider guardrails in the case of "unreasonably high" positive NAERs, not just negative NAERs?

**Commented [VM22313R312]:** No objections to new proposed language to change wording from "unreasonably high" to "extreme" and reflecting positive or negative discount rates.

the start of the projection plus the allocated amount of PIMR attributable to the assets selected. Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:

- i. Any hedge instruments held in support of the contracts being valued; and
  - ii. An amount of assets held in the general account equal to the approximate value of statutory reserves as of the start of the projections less the amount in (i).
- b. If the amount of initial general account assets is negative, the model should reflect a projected interest expense. General account assets chosen for use as described above shall be selected on a consistent basis from one reserve valuation hereunder to the next.
2. Valuation of Projected Assets

For purposes of determining the projected accumulated deficiencies, the value of projected assets shall be determined in a manner consistent with their value at the start of the projection. For assets assumed to be purchased during a projection, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics. However, for derivative instruments that are used in hedging and are not assumed to be sold during a particular projection interval, the company may account for them at an amortized cost in an appropriate manner elected by the company.

**Guidance Note:** Accounting for hedge assets should recognize any methodology prescribed by a company's state of domicile.

3. General Account Assets
- a. General account assets shall be projected, net of projected defaults, using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested in a manner that is representative of and consistent with the company's investment policy, subject to the following requirements:
    - i. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments or a fixed or floating rate interest basis, shall be determined by the company as part of the model representation;
    - ii. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the projected Treasury Department curve along the relevant scenario and the requirements for gross asset spread assumptions stated below;

- iii. For purchases of public non-callable corporate bonds, follow the requirements defined in VM-20 Sections 7.E, 7.F and 9.F. The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four;
- iv. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in VM-20 Section 9.F for interest rate swap spreads;
- v. For purchases of other fixed income investments, if included in the modeled company investment strategy, set assumed gross asset spreads over U.S. Treasuries in a manner that is consistent with, and results in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.

b. Notwithstanding the above requirements, the modeled aggregate reserve shall be the higher of that produced by the modeled company investment strategy and any non-prescribed asset spreads shall be adjusted as necessary so that the aggregate reserve is not less than that which would be obtained produced by substituting an alternative investment strategy in which all the fixed income reinvestment assets have the same weighted average life (WAL) as the reinvestment assets in the modeled company investment strategy and are all public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of:

- i. ~~5%~~ Treasury
- ii. ~~15~~ 20% PBR credit rating 3 (Aa2/AA)
- iii. ~~40~~ 80% PBR credit rating 6 (A2/A)
- iv. ~~40~~ PBR credit rating 9 (Baa/BBB)

c. Any disinvestment shall be modeled in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable, provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period, taking into account duration, ratings, and other attributes of the borrowing mechanism. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with, but not necessarily the same as, the gross asset spreads in Section 4.D.4.a.iii and Section 4.D.4.a.iv, recognizing that initial assets that mature during the projection may have different characteristics than modeled reinvestment assets.

Commented [X314]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22315R314]: Edits to address this comment will be reflected in next exposure

Commented [CD316]: should this be "stochastic reserve", since this is within Section 4: Determination of Stochastic Reserve

Commented [VM22317R316]: Edits to address this comment will be reflected in next exposure

Commented [X318]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22319R318]: Edits to address this comment will be reflected in next exposure

Commented [CD320]: Suggest making this plural ("Treasuries") to be consistent with Section 13.B.9

Commented [VM22321R320]: Edits to address this comment will be reflected in next exposure

Commented [X322]: The proposed reinvestment mix comes from a different assumption context in current VM-22, i.e., it is designed to calculate the maximum allowed valuation interest rates, while the reinvestment mix for VM-22 PBR draft is to put a guardrail around the fixed income reinvestment assets. A guardrail is not intended to identify outliers and should not be tied to an average. The biggest concern is with the higher allocation percentage in BBB assets. The valuation manual should build an appropriate level of conservatism in the valuation standards instead of reflecting industry trends. By moving from VM-20 and VM-21 required mix of 50%/50% AA/A to the proposed mix, the gross spreads increased by 20-30 bps for almost all WAL. We do not object to using a lower credit quality guardrail to get rid of any excessive conservatism. We recommend considering and comparing with other alternative allocations, something between the current and the proposed, e.g., 20% AA and 80% A. This will help regulators make informed decisions. In any case, we should be consistent with VM-20 and VM-21. If a change is made, it needs to be for all three.

Commented [VM22323R322]: Varying opinions among the Subgroup. Voted to revisit and determine the guardrail after the field test.

Commented [CD324]: These references should be Section 4.D.3.a.iii and 4.D.3.a.v

Commented [VM22325R324]: Edits to address this comment will be reflected in next exposure

**Guidance Note:** This limitation is being referred to Life Actuarial (A) Task Force for review. The simple language above “provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period” is not intended to impose a literal requirement. It is intended to reflect a general concept to prevent excessively optimistic borrowing assumptions. It is recognized that borrowing parameters and rules can be complicated, such that modeling limitations may not allow for literal compliance, in every time step, as long as the reserve is not materially affected. However, if the company is unable to fully apply this restriction, prudence dictates that a company shall not allow borrowing assumptions to materially reduce the reserve.

4. Cash Flows from Invested Assets

a. Cash flows from general account fixed income assets, including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario.
- ii. Reflect asset default costs as prescribed in VM-20 Section 9.F and anticipated investment expenses through deductions to the gross investment income.
- iii. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.
- iv. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns or other economic values directly in the projection of asset cash flows. Asset defaults are not subject to this requirement, since asset default assumptions must be determined by the prescribed method in VM-20 Sections 7.E, 7.F and 9.F as noted in 4.a.ii above.

b. Cash flows from general account index funds and general account equity assets—i.e., non-fixed income assets having substantial volatility of returns, such as common stocks and real estate— including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Determine the grouping for asset categories and the allocation of specific assets to each category in a manner that is consistent with that used for index crediting strategies, as discussed in Section 4.A.2.
- ii. Project the gross investment return including realized and unrealized capital gains in a manner that is consistent with the stochastically generated scenarios.
- iii. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses through a deduction to the gross investment return using prudent estimate assumptions.

**Commented [X326]:** Correct an inaccurate VM section reference. The prescribed asset default spreads assumption should be referred to VM-20 Section 9.F. VM-20 Section 7.E and 7.F are requirements for reinvestment assets, disinvestment and cash flows for invested assets. In 7.F, VM-20 just refers to 9.F for defaults.

**Commented [VM22327R326]:** Edits to address this comment will be reflected in next exposure

**Commented [X328]:** Request clarification around the meaning of “general account index funds”.

**Commented [VM22329R328]:** Edits to address this comment will be reflected in next exposure

- c. Cash flows for each projection interval for policy loan assets shall follow the requirements in Section 10.H.

Commented [CD330]: should this reference Section 10.H?

E. Projection of Annuitization Benefits

Commented [VM22331R330]: Edits to address this comment will be reflected in next exposure

1. Assumed Annuitization Purchase Rates

- a. For payouts specified at issue (such as single premium immediate annuities, deferred income annuities, and certain structured settlements), such purchase rates shall reflect the payout rate specified in the contract.

Commented [CD332]: is there a difference between "purchase rates" and "payout rates"? Both terms are used, so that makes the language unclear. If they are the same, suggest sticking with "purchase rates".

- b. For purposes of projecting future elective annuitization benefits (including annuitizations stemming from the election of a GMIB) and withdrawal amounts from GMWBs, the projected annuitization purchase rates shall be determined assuming that market interest rates available at the time of election are the interest rates used to project general account assets, as determined in Section 4.D.4. In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract.

Commented [VM22333R332]: Edits to address this comment will be reflected in next exposure

Commented [X334]: Suggest deleting "In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract." as it appears to be covered by E.1.a.

2. Projected Election of GMIBs, GMWBs and Other Annuitization Options

Commented [VM22335R334]: Edits to address this comment will be reflected in next exposure

- a. For contracts projected to elect future annuitization options (including annuitizations stemming from the election of a GMIB) or for projections of GMWB benefits once the account value has been depleted, the projections may shall assume the contract will stay in force, the projected periodic payments are paid, and the associated maintenance expenses are incurred.

Commented [X336]: Reinstate the parenthetical content "(including annuitizations stemming from the election of a GMIB)" since there are GMIB riders attached to fixed annuity products.

Commented [VM22337R336]: Edits to address this comment will be reflected in next exposure

F. Frequency of Projection and Time Horizon

Commented [X338]: Delete sentence since it repeats 4.E.1.a.

- 1. Use of an annual cash-flow frequency ("timestep") is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of sensitivity to projection frequency should be validated by testing wherein the company should determine that the use of a more frequent—i.e., shorter—time step does not materially increase reserves. A more frequent time increment should always be used when the product features are sensitive to projection period frequency.

Commented [VM22339R338]: Edits to address this comment will be reflected in next exposure

Commented [X340]: Suggest deleting "may" as there appears to be only option.

Commented [VM22341R340]: Edits to address this comment will be reflected in next exposure

Care must be taken in simulating fee income and expenses when using an annual time step. For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption. It is also important that the frequency of the investment return model be linked appropriately to the projection horizon in the liability model. In particular, the horizon should be sufficiently long so as to capture the vast majority of costs (on a present value basis) from the scenarios.

Commented [X342]: Projection Period is already covered in 4.A.6. Should not be in two places with different guidance.

Commented [VM22343R342]: Edits to address this comment will be reflected in next exposure

Commented [X344]: Reinstate the deleted example of "For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption."

**Guidance Note:** As a general guide, the forecast horizon should not be less than 20 years.

Commented [VM22345R344]: Edits to address this comment will be reflected in next exposure

G. Compliance with ASOPs

When determining a stochastic reserve SR, the analysis shall conform to the ASOPs as promulgated from time to time by the ASB.

Under these requirements, an actuary will make various determinations, verifications and certifications. The company shall provide the actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in these requirements and responsibilities arising from each applicable ASOP.



Section 5: Reinsurance Ceded and Assumed

A. Treatment of Reinsurance Ceded in the Aggregate Reserve

1. Aggregate Reserve Pre- and Post-Reinsurance Ceded

As noted in Section 3.B, the aggregate reserve is determined both pre-reinsurance ceded and post-reinsurance ceded. Therefore, it is necessary to determine the components needed to determine the aggregate reserve—i.e., the stochastic reserve, additional standard projection amount, the SR, DR, and/or the reserve amount valued using requirements in VM-A and VM-C, as applicable—on both bases. Sections 5.A.2 and 5.A.3 discuss adjustments to inputs necessary to determine these components on both a post-reinsurance ceded and a pre-reinsurance ceded basis. Note that due allowance for reasonable approximations may be used where appropriate.

2.  
 2. Stochastic Reserve

Reflection of Reinsurance Cash Flows in the DR or SR

- a. In order to determine the aggregate reserve post-reinsurance ceded, accumulated deficiencies, scenario reserves, and the resulting stochastic reserve SR and DR shall be determined reflecting the effects of reinsurance treaties that meet the statutory requirements that would allow the treaty to be accounted for as reinsurance within statutory accounting. This involves including, where appropriate, all projected reinsurance premiums or other costs and all reinsurance recoveries, where the reinsurance cash flows reflect all the provisions in the reinsurance agreement, using prudent estimate assumptions.
  - i. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.
  - ii. All significant terms and provisions within reinsurance treaties shall be reflected. In addition, it shall be assumed that each party is knowledgeable about the treaty provisions and will exercise them to their advantage.

**Guidance Note:** Renegotiation of the treaty upon the expiration of an experience refund provision or at any other time shall not be assumed if such would be beneficial to the company and not beneficial to the counterparty. This is applicable to both the ceding party and assuming party within a reinsurance arrangement.

- iii. If the company has knowledge that a counterparty is financially impaired, the company shall establish a margin for the risk of default by the counterparty. In the absence of knowledge that the counterparty is financially impaired, the company is not required to establish a margin for the risk of default by the counterparty.
- iv. A company shall include the cash flows from a reinsurance agreement or amendment in calculating the stochastic aggregate reserve if such qualifies for credit in compliance with Appendix A-791 of the Accounting Practices and Procedures Manual. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum aggregate reserve by the absolute value of such reductions in surplus.

**Commented [X346]:** The wording and titling may need to be tightened due to clarify which items apply to assumed and ceded reinsurance in the text.

**Commented [VM22347R346]:** Edits to address this comment will be reflected in next exposure

**Commented [X348]:** Delete and just have title be "Reinsurance". Should structure be more like VM-20?

**Commented [X349R348]:** I, II (and III—VM-21 needs edits)

**Commented [VM22350R348]:** Edits to address this comment will be reflected in next exposure

**Commented [CD351]:** "and Assumed" is added here, but there is still only a subsection 5.A that addresses reinsurance ceded (at least in the section header).

**Commented [VM22352R351]:** Edits to address this comment will be reflected in next exposure

**Commented [CD353]:** need to add "and Assumed" here?

**Commented [VM22354R353]:** Edits to address this comment will be reflected in next exposure

**Commented [X355]:** reinstate

**Commented [VM22356R355]:** Edits to address this comment will be reflected in next exposure

**Commented [X357]:** Can take out vague approximation references, since now have a general allowance for appropriate approximations.

**Commented [VM22358R357]:** Edits to address this comment will be reflected in next exposure

**Commented [X359]:** Consistent with VM-20

**Commented [VM22360R359]:** Edits to address this comment will be reflected in next exposure

**Commented [X361]:** VM-20 Section 8.A.1 makes sense here as well.

**Commented [VM22362R361]:** Edits to address this comment will be reflected in next exposure

**Commented [CD363]:** should this be "stochastic reserve"?

**Commented [VM22364R363]:** Edits to address this comment will be reflected in next exposure

**Commented [X365]:** VM-22 draft so far uses aggregate, not minimum.

**Commented [VM22366R365]:** Edits to address this comment will be reflected in next exposure

- b. In order to determine the ~~stochastic reserve~~ SR and DR on a pre-reinsurance ceded basis, accumulated deficiencies, scenario reserves, and the resulting ~~stochastic reserve~~ SR and DR shall be determined ignoring the effects of reinsurance ceded within the projections. Different approaches may be used to determine the starting assets on the ceded portion of the contracts, dependent upon the characteristics of a given treaty:
- i. For a standard coinsurance treaty, where the assets supporting the ceded liabilities were transferred to the assuming reinsurer, one acceptable approach involves a projection based on using starting assets on the ceded portion of the policies that are similar to those supporting the retained portion of the ceded policies or supporting similar types of policies. Scaling up each asset supporting the retained portion of the contract is also an acceptable method.

**Guidance Note:** For standard pro rata insurance treaties ~~(does that do not include experience refunds)~~, where allocated expenses are similar to the renewal expense allowance, reflecting the quota share applied to the present value of future reinsurance cash flows pertaining to the reinsured block of business may be considered as a possible approach to determine the ceded reserves.

- ii. Alternatively, a treaty may contain an identifiable portfolio of assets associated with the ceded liabilities. This could be the case for several forms of reinsurance: funds withheld coinsurance; modified coinsurance; coinsurance with a trust. To the extent these assets would be available to the cedant, an acceptable approach could involve modeling this portfolio of assets. To the extent that these assets were insufficient to defease the ceded liabilities, the modeling would partially default to the approach discussed for a standard coinsurance treaty. To the extent these assets exceeded what might be needed to defease the ceded liabilities (perhaps an over collateralization requirement in a trust), the inclusion of such assets shall be limited.

**Guidance Note:** Section 3.5.2 in ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*, provides possible methods for constructing a hypothetical pre-reinsurance asset portfolio, if necessary, for purposes of the pre-reinsurance reserve calculation.

- c. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
- d. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the NGE in reinsurance cash flows, the company shall include, but not be limited to, the following:
- i. The usual and customary practices associated with such agreements.
  - ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
  - iii. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
  - iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.

Commented [X367]: Correct phrasing.

Commented [VM22368R367]: Edits to address this comment will be reflected in next exposure

- v. Actions that might be taken by a party if the counterparty is in financial difficulty.
- e. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:
  - i. Stochastically model the risk factors directly in the cash-flow model when calculating the SR.
  - ii. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the SR to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is longevity reinsurance.

### 3. Reserve Determined Upon Passing the Exclusion Test

If a company passes the stochastic exclusion test and elects to use a methodology pursuant to applicable Sections VM-A and VM-C, as allowed in Section 3.E, it is important to note that the methodology produces reserves on a pre-reinsurance ceded basis. Therefore, the reserve must be adjusted for any reinsurance ceded accordingly. In addition, reserves valued under applicable Sections in VM-A and VM-C, unadjusted for reinsurance, shall be applied to the contracts falling under the scope of these requirements to determine the aggregate reserve prior to reinsurance.

It should be noted that the ~~pre-reinsurance-ceded~~ and ~~post-reinsurance-ceded~~ reserves may result in different outcomes for the exclusion test. In particular, it is possible that the ~~pre-reinsurance-ceded~~ reserves would pass the relevant exclusion test (and allow the use of VM-A and VM-C) while the ~~post-reinsurance-ceded~~ reserves might not, or vice versa.

### 4. Additional Standard Projection Amount

Where reinsurance is ceded, the additional standard projection amount shall be calculated as described in Section 6 to reflect the reinsurance costs and reinsurance recoveries under the reinsurance treaties. The additional standard projection amount shall also be calculated pre-reinsurance ceded using the methods described in Section 6 but ignoring the effects of the reinsurance ceded.

**Commented [X369]:** VM-20 Section 8.C.7 seems particularly applicable. We encourage others to also review VM-20 Section 8 for other sections that should also apply. VM-20 Section 8 is much more developed than VM-20 Section 5 with many more considerations for assumption setting, and we would suggest the VM-22 subgroup consider rewriting starting with VM-20 instead of VM-21.

**Commented [VM22370R369]:** Subgroup agreed with reflecting this language in the VM-22 draft

**Commented [VM22371]:** Per discussion on how to model mortality for longevity reinsurance, the VM-22 Subgroup decided to port over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk.

**Commented [X372]:** Both referring to reinsurance ceded. Should be clarified.

**Commented [VM22373R372]:** Edits to address this comment will be reflected in next exposure

**Commented [X374]:** ceded

**Commented [VM22375R374]:** Edits to address this comment will be reflected in next exposure

**Commented [X376]:** ceded

**Commented [VM22377R376]:** Edits to address this comment will be reflected in next exposure

**Commented [X378]:** Opposite could also be true.

**Commented [VM22379R378]:** Edits to address this comment will be reflected in next exposure

**Commented [X380]:** The current VM-21 language here looks to work for VM-22 without needing to know the specific assumptions, etc., for the SPA.

**Commented [VM22381R380]:** Edits to address this comment will be reflected in next exposure

Section 6: Standard Projection Amount To Be Determined

**Commented [VM22382]:** NY Comment Letter: Current CARVM standards should be a minimum floor for VM-22 policies, and only the stochastic reserve should permit grouping whereas the minimum floor should be seriatim.

**Commented [VM22383R382]:** The Subgroup will discuss the standard projection amount at a later point

**Commented [X384]:** SPA Section placement here still makes sense, but SPA under development.

**Commented [VM22385R384]:** Edit to update the title of this section will be reflected in next exposure

**Commented [VM22386]:** Refer to equitable comment letter, which expresses support for the standard projection amount as a binding floor, with the suggestion to rely on company-specific assumptions for insignificant assumptions that are difficult to develop.

**Commented [VM22387R386]:** The Subgroup will discuss the standard projection amount at a later point

**Commented [NJ388]:** Once this is written, the language from 4.A.1.a for longevity reinsurance could be added here as well, i.e. the standard projection would use net premiums based on the k factor approach, using the standard projection prescribed assumptions. Floor on std projection is at the contract level

**Commented [VM22389R388]:** The Subgroup will discuss the standard projection amount at a later point

| Section 6: To Be Determined

Section 7: Exclusion Testing

A. Stochastic Exclusion Test Requirement Overview

1. The company may elect to exclude one or more groups of contracts from the stochastic reserve SR calculation if the stochastic exclusion test (SET) is satisfied for each of the group of contracts. The company has the option to calculate or not calculate the SET.
  - a. If the company does not elect to calculate the SET for one or more groups of contracts, or the company calculates the SET and fails the test for such groups of contracts, the reserve methodology described in Section 4 shall be used for calculating the aggregate reserve for those groups of contracts.
  - b. If the company elects to calculate the SET for one or more groups of contracts, and passes the test for such groups of contracts, then for each group of contracts that passes the SET, the company shall choose whether or not to use the reserve methodology described in Section 4 for those groups that group of contracts. If the reserve methodology described in Section 4 is not used for one or more groups of contracts, then the company shall use the reserve methodology pursuant to applicable requirements in VM-A and VM-C to calculate the aggregate reserve for those groups of contracts.
  - c. A company may not exclude a group of contracts from the stochastic reserve SR requirements if there are one or more future hedging strategies programs associated with supporting the contracts, with the exception of hedging programs solely supporting index credits as described in Section 9.A.1.
  - d. A company may elect to automatically exclude one or more groups of policies from the stochastic reserve calculation without passing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
    - i. All of the contracts are either:
      - Single Premium Immediate Annuities,
      - Term Certain Payout Annuities, or
      - Structured Settlement Contracts;
    - ii. None of the contracts are pension risk transfer annuities (PRT) or are covered under a longevity reinsurance agreement;
    - iii. Future payout benefits are either level or stay within 5% of the initial payout benefit amount over time;
    - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
    - v. The average [Macauley duration] of the liabilities of the contracts as measured from the issue date (or premium determination date) is less than [X].

B. Requirement to Pass the Types of Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

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- Commented [X390]:** Need to modify exclusion testing section to reflect SPA.
- Commented [VM22391R390]:** The Subgroup will discuss the standard projection amount at a later point
- Commented [NJ392]:** Longevity reinsurance likely to be scoped out of the stochastic reserve unless the stochastic reserve includes consideration of stochastic mortality. If it stays as stochastic interest only, then it probably does make sense that it would meet the exclusion testing. For exclusion testing, the k factor approach should continue to apply, and it should not be combined with other blocks of business
- Commented [VM22393R392]:** VM-22 Subgroup will discuss this comment as part of addressing the longevity reinsurance exposure in future discussions
- Commented [X394]:** inconsistent groups vs. group references.
- Commented [VM22395R394]:** Edits to address this comment will be reflected in next exposure
- Commented [CD396]:** should this be "stochastic reserve", since Section 4 is about determining the st... [81]
- Commented [VM22397R396]:** Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve... [82]
- Commented [X398]:** Decision is independent for each group the SET is performed on.
- Commented [VM22399R398]:** Edits to address this comment will be reflected in next exposure
- Commented [CD400]:** suggest deleting this highlighted part of the sentence
- Commented [VM22401R400]:** Edits to address this comment will be reflected in next exposure
- Commented [CD402]:** see earlier comment about the phrase "future hedge program" being confusing.
- Commented [VM22403R402]:** Subgroup decided to use consistent language as the changes made to VM-21... [83]
- Commented [X404]:** Is "associated with the contracts" the same as the earlier use of "supporting the contra... [84]
- Commented [VM22405R404]:** Academy will consider potential language to be more specific with respect t... [85]
- Commented [VM22406]:** Subgroup voted to permit... below a certain duration to automatically pass... [86]
- Commented [VM22407]:** New language drafted by select Subgroup Members to provide certain conditi... [87]
- Commented [VM22408R407]:** Academy will provide a proposed durational threshold in this language durin... [88]
- Commented [CD409]:** Suggest renaming this section header/name to "Requirements to Pass the SET". Th... [89]
- Commented [VM22410R409]:** Edits to address this comment will be reflected in next exposure

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date ~~within 12 months before the valuation date~~ the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. ~~SET~~ Certification Method—For groups of contracts that do not have guaranteed living benefits, future hedging programs, strategies, or pension risk transfer business, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material aggregate risk levels across interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments). ~~The company shall provide the certification and documentation supporting the certification to the commissioner upon request.~~

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

- a) A demonstration that, using requirements under VM-A and VM-C for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great as the assets required to support the group of contracts and certificates using the company’s cash-flow testing model under each of the ~~648~~ scenarios identified in this section Section 7.C.1 or alternatively each of the New York seven scenarios-economic scenarios-under each of the three mortality adjustment factors identified in Section 7.C.1.
- b) A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
- c) A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company’s non-guaranteed elements (NGEs) policy, assets backing the group of contracts, the company’s longevity risk, and the company’s investment strategy.

C. Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the stochastic reserve ~~SR~~ requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of (b-a)/a is less than the lesser/greater of [x]% where and the percentage change that would trigger the company’s materiality standard, where:

Commented [CD411]: not sure why this part is de... [90]

Commented [VM22412R411]: Edits to address t... [91]

Commented [X413]: We recommend removing... [92]

Commented [VM22414R413]: Subgroup voted t... [93]

Commented [CD415]: See earlier comments abo... [94]

Commented [VM22416R415]: The Subgroup dec... [95]

Commented [X417]: Needs to be defined.

Commented [VM22418R417]: The Subgroup dec... [96]

Commented [X419]: Needs a comma

Commented [VM22420R419]: Edits to address t... [98]

Commented [CD421]: need comma after "business"

Commented [VM22422R421]: Edits to address t... [97]

Commented [CD423]: what is meant by "aggrega... [99]

Commented [VM22424R423]: Edits to address... [100]

Commented [X425]: This is not in VM-20 and we... [101]

Commented [VM22426R425]: Edits to address... [102]

Commented [X427]: This is covered by VM-31

Commented [VM22428R427]: Edits to address... [103]

Commented [CD429]: note, there is no insertio... [104]

Commented [VM22430R429]: Edits to address... [105]

Commented [CD431]: This wording is a little clu... [106]

Commented [VM22432R431]: Edits to address... [107]

Commented [X433]: Replace all "contracts" wit... [109]

Commented [VM22434R433]: Edits to address... [108]

Commented [X435]: Need mortality stresses if using NY7

Commented [VM22436R435]: No objections fr... [110]

Commented [X437]: Need complete list of risks

Commented [VM22438R437]: Edits to address... [111]

Commented [CD439]: need to insert "longevity risk" here

Commented [VM22440R439]: Edits to address... [112]

Commented [X441]: Need complete list of risks

Commented [VM22442R441]: Edits to address... [113]

Commented [X443]: Need to add a review of th... [114]

Commented [VM22444R443]: Edits to address... [115]

Commented [X445]: Is written, the SERT assum... [116]

Commented [VM22446R445]: Consensus to us... [117]

Commented [X447]: Using (a) in the denomina... [118]

Commented [VM22448R447]: Consensus to us... [119]

Commented [X449]: The variability should be as... [120]

Commented [VM22450R449]: No objections fr... [121]

- a. a = the adjusted scenario reserve described in Paragraph 7.C.2.a below using economic scenario 9, and 100% as the adjustment factor for mortality, the baseline economic scenario, as described in Appendix 1.E of VM-20.
- b. b = the largest adjusted scenario reserve described in Paragraph 7.C.2.b-a below under any of the other 15 economic scenarios described in Appendix 1.E of VM-20 under both [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company's margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company's margin for this exercise.

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve for scenarios other than the baseline economic scenario, minus the adjusted scenario reserve for the baseline economic scenario, and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of b.

2. In calculating the ratio in subsection (Section 7.C.1) above:

- a. The company shall calculate an adjusted scenario reserve for the group of contracts for each of each of the 16 scenario economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:
  - i. The scenario reserve defined in Section 4, but with the following differences:
    - a) Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Paragraph Section 7.C.1.b of this section.
    - b) Using the interest rates and equity return assumptions specific to each scenario.
    - c) Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
    - d) Shall reflect future mortality improvement in line with anticipated experience assumptions.
    - e) Shall not reflect correlation between longevity and economic risks.
  - ii. The gross premium reserve developed from the cash flows from the company's asset adequacy analysis models, using the experience assumptions of the company's cash-flow analysis, but with the following differences:
    - a) Using the interest rates and equity return assumptions specific to each scenario.

- Commented [X451]: Correcting reference
- Commented [VM22452R451]: Edits to address this comment will be reflected in next exposure
- Commented [CD453]: better to keep the reference to the full Section (i.e., Section 7.C.2.a.i)
- Commented [VM22454R453]: Edits to address this comment will be reflected in next exposure
- Commented [X455]: Correcting reference
- Commented [VM22456R455]: Edits to address this comment will be reflected in next exposure
- Commented [CD457]: better to keep the reference to the full Section (i.e., Section 7.C.2.b)
- Commented [VM22458R457]: Edits to address this comment will be reflected in next exposure
- Commented [X459]: Need to modify in case largest result is just from the mortality stress on the same scenario.
- Commented [VM22460R459]: Edits to address this comment will be reflected in next exposure
- Commented [X461]: Need to modify in case largest result is just from the economic stress on the same mortality level.
- Commented [VM22462R461]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X463]: Need to ensure we have captured a prudent level of mortality variation for any given company in this test.
- Commented [VM22464R463]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X465]: Updating to reflect mortality/economic scenario combinations.
- Commented [VM22466R465]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X467]: For clarity
- Commented [VM22468R467]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X469]: Be consistent with standard VM references
- Commented [VM22470R469]: Edits to address ... [124]
- Commented [CD471]: better to keep the referenc ... [123]
- Commented [VM22472R471]: Edits to address ... [122]
- Commented [CD473]: why delete this? seems ... [126]
- Commented [VM22474R473]: Edits to address ... [125]
- Commented [X475]: Be consistent with standar ... [127]
- Commented [VM22476R475]: Edits to address ... [128]
- Commented [CD477]: better to reference the f ... [129]
- Commented [VM22478R477]: Edits to address ... [130]



- b) Using the mortality scalars described in ~~Paragraph~~ Section 7.C.1.b of this section.
  - c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the company’s cash-flow testing assumptions for default costs and reinvestment earnings.
- b. ~~The company shall use the most current 46 available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.~~
- c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
- d. ~~The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.~~
- e. ~~If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to not conduct the stochastic exclusion ratio test under only a pre-reinsurance-ceded basis upon determining the , either pre-reinsurance-ceded basis upon determining the prior post-reinsurance-reserve-ceded-aggregate reserve.~~
3. ~~If the ratio calculated in this section is less than [x]% pre-non-proportional reinsurance, but is greater than [x]% post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.~~

**Guidance Note:** Further description of non-proportional reinsurance is provided in Paragraph 16 of SSAP 61R.

- a. An example of an acceptable demonstration:
- i. For convenience in notation •  $SERT = \frac{b-a}{a}$  defined in Section 7.C.1 above
    - a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted  $SERT_{gn}$
    - b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted  $SERT_{nn}$
  - ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-

**Commented [X479]:** Be consistent with standard VM references

**Commented [VM22480R479]:** Edits to address this comment will be reflected in next exposure

**Commented [CD481]:** better to reference the full Section

**Commented [VM22482R481]:** Edits to address this comment will be reflected in next exposure

**Commented [X483]:** No reason for change/inconsistency with other chapters - reject edit.

**Commented [VM22484R483]:** Edits to address this comment will be reflected in next exposure

**Commented [X485]:** Clarification is needed around reference to “significantly different risk profiles”.

**Commented [VM22486R485]:** Subgroup voted to use the “significantly different risk profiles” language for the exclusion test, consistent with VM-20.

**Commented [CD487]:** to be more specific, say “stochastic exclusion ratio test”

**Commented [VM22488R487]:** Edits to address this comment will be reflected in next exposure

**Commented [X489]:** Original did not make sense. Also, the point is that you just need one basis, either pre-reinsurance or post-reinsurance.

**Commented [VM22490R489]:** Edits to address this comment will be reflected in next exposure

**Commented [X491]:** We request clarification or definition of the term “non-proportional reinsurance”.

**Commented [VM22492R491]:** Added a guidance note to refer to paragraph 16 in SSAP 61R to provide the definition of non-proportional reinsurance.

**Commented [X493]:** Does this make sense for VM-20 as well?

**Commented [VM22494R493]:** Subgroup to only focus on VM-22 for now

proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.

- iii. So, if  $SERT_{gn} \leq [x]_{t-1}\%$  but  $SERT_{nn} > [x]_{t-1}\%$ , then compute the largest percent increase in reserve (LPIR) =  $(b-a)/a$ , both “gross of non-proportional” and “net of non-proportional.”

$$LPIR_{gn} = (b_{gy} - a_{gy}) / (b_{gn} - a_{gn}) / a_{gn}$$

$$LPIR_{nn} = (b_{ny} - a_{ny}) / (b_{nn} - a_{nn}) / a_{nn}$$

Note that the scenario underlying  $b_{gn}$  could be different from the scenario underlying  $b_{nn}$ .

If  $SERT_{gn} \times LPIR_{nn} / LPIR_{gn} < [x]_{t-1}\%$  then the block of contracts passes the SERT.

- b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 1648 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.

- 4. The SERT may not be used for a group of contracts if, using the current year’s data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method in this section of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in this section and concluded that such certification could not legitimately be made.

D. Stochastic Exclusion Demonstration Test

- 1. In order to exclude a group of contracts from the stochastic reserve SR requirements using the methodology in this section Stochastic Exclusion Demonstration Test, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:

- a. The demonstration shall provide a reasonable assurance that if the stochastic reserve SR was calculated on a stand-alone basis for the group of contracts subject to the stochastic reserve SR exclusion, the resulting stochastic reserve for those groups of contracts would not be higher than the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of contracts from the stochastic reserve SR requirements.

- b. If, as of the end of any calendar year, the company determines the aggregate statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C for the group of contracts no longer adequately provides for all material risks, the exclusion shall be discontinued, and the company fails the SERT SET for those contracts.

Commented [X495]: We believe subscript “gy” should be “gn”.

Commented [VM22496R495]: Edits to address this comment will be reflected in next exposure

Commented [X497]: % missing

Commented [VM22498R497]: Edits to address this comment will be reflected in next exposure

Commented [X499]: Note that LPIR is just the SERT using the VM-22 formulation (b-a)/a.

Commented [VM22500R499]: Edits to address this comment will be reflected in next exposure

Commented [X501]: The first and last terms on the left side of this equation cancel out, so it just ends up with needing to pass the SERT on the net basis again. This worked when (c) was the denominator, but now with (a) in the denominator this adjustment is meaningless. Take out the whole example, or revise the SERT to use benefits in the denominator again. Or some new formulation for SERT.

Commented [VM22502R501]: Updated denominator to be consistent with VM-20, which should address issue

Commented [X503]: In VM-20, it is only prohibited for the clearly sufficiently robust attempts of the demonstration method where failing shows the SR would be greater. The other two options could have been incomplete demonstrations and not necessarily imply the SR would be dominant.

Commented [VM22504R503]: No objections from the Subgroup to adding this language

Commented [X505]: Clearer language

Commented [VM22506R505]: Edits to address this comment will be reflected in next exposure

Commented [X507]: Does this statement imply a floor reserve of VM-A and VM-C? VM-20 does require the NPR as the floor of the reserve but as written, VM-22 does not require a floor reserve. Recommend removing 1.a. Same statement with the 2.a statement demonstration. This requirement does not apply to the other permitted tests, which seemed counterintuitive.

Commented [VM22508R507]: ACLI will follow-up on whether to recommend removing this paragraph/option or only a specific statement within the paragraph.

Commented [CD509]: should this, instead, refer to the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C?

Commented [VM22510R509]: Edits to address this comment will be reflected in next exposure

Commented [X511]: Typo is also in VM-20

Commented [VM22512R511]: Will follow-up upon addressing VM-30 disclosure requirements

- c. The demonstration may be based on analysis from a date that precedes the valuation date for the initial year to which it applies if the demonstration includes an explanation of why the use of such a date will not produce a material change in the outcome, as compared to results based on an analysis as of the valuation date.
  - d. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques, such as derivative programs and reinsurance.
2. The company may use one of the following or another method acceptable to the insurance commissioner to demonstrate compliance with ~~subsection~~Section 7.D.1 above:
- a. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis.
  - b. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios.
  - c. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis, but using a representative sample of contracts in the ~~stochastic reserve~~SR calculations.
  - d. Demonstrate that any risk characteristics that would otherwise cause the ~~stochastic reserve~~SR calculated on a stand-alone basis to exceed the statutory reserve calculated in accordance with VM-A and VM-C, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance or passing the risk on to the ~~contract policyholder~~ by contract provision.

E. Deterministic Certification Option

1. The company ~~has the option to may~~ determine the ~~stochastic reserve~~SR for a group of contracts using a single deterministic economic scenario, subject to the following conditions.
- a. The company certifies that economic conditions do not materially influence anticipated contract holder behavior for the group of ~~policies, contracts and certificates~~. Examples of contract holder options that are materially influenced by economic conditions include surrender benefits, recurring premium payments, and guaranteed living benefits.
  - b. The company certifies that the group of ~~policies, contracts and certificates~~ is not supported by a reinvestment strategy that contains ~~future hedge purchases~~.
  - c. The company must perform and disclose results from the stochastic exclusion ratio test following the requirements in Section 7.C, ~~thereby disclosing and the scenario reserve volatility across various~~company must pass the SERT when considering only the 16 economic scenarios: paired with the 100% mortality scenario.

Commented [CD513]: should say "Section"

Commented [VM22514R513]: Edits to address this comment will be reflected in next exposure

Commented [CD515]: "contract holder"

Commented [VM22516R515]: Edits to address this comment will be reflected in next exposure

Commented [X517]: Need SPA for DR as well as SR

Commented [VM22518R517]: Will discuss the standard projection amount further on future calls

Commented [CD519]: suggest saying "may" instead of "has the option to"

Commented [VM22520R519]: Edits to address this comment will be reflected in next exposure

Commented [CD521]: "contracts"

Commented [VM22522R521]: Edits to address this comment will be reflected in next exposure

Commented [X523]: Clarify if this was the intent to exclude contracts supported by index hedging.

Commented [X524]: This is needed to assure the SR is not needed. Otherwise this section is incomplete and does not support using a DR.

Commented [VM22525R524]: Subgroup agrees with including the 100% mortality scenario.

- d. The company must disclose a description of contracts and associated features in the certification.

~~Drafting Note: Consider revisiting Paragraph E.1.c to possibly either require i) falling below a preset threshold for the exclusion ratio test under a single longevity/mortality scenario; or ii) to pass the exclusion test if longevity is not included as part of the ratio test.~~

- 2. The ~~stochastic reserve~~SR for the group of contracts under the Deterministic Certification Option is determined as follows:

- a. Cash flows are projected in compliance with the applicable requirements in Section 4, Section 5, Section 10, and Section 11 of VM-22 over a single economic scenario (scenario 12 found in Appendix 1 of VM-20).
- b. The ~~stochastic reserve~~SR equals the scenario reserve following the requirements for Section 4.

~~Guidance Note: The Deterministic Certification Option is intended to provide a non stochastic option for Single Premium Immediate Annuities (SPIAs) and similar payout annuity products that contain limited or no optionality in the asset and liability cash flow projections.~~

Commented [X526]: ~~Free with drafting note. Edit above~~

Commented [VM22527R526]: Subgroup agrees with including the 100% mortality scenario.

Commented [X528]: Recommend deleting guidance note, as it doesn't provide full or clear scope of what may be excluded, so could be misread to either guarantee option for certain products or exclude the option for other products.

Section 8: To Be Determined (Scenario Generation for VM-21)

Section 9: Modeling Hedges under a ~~Future Non-Index Credit~~ Future Hedging Strategy

A. Initial Considerations

1. This section applies to modeling of hedges other than situations where the company (a) only hedges index credits. ~~If the company, or (b) clearly separates index credit hedging from other hedging, then only the section only pertains to the other hedging if the index hedging follows. In those situations, the modeling of hedges supporting index credits can be simplified including applying an index credit hedge margin, following the requirements in Section 4.A.4.b.i.~~
2. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the calculation of the ~~stochastic reserve~~SR, determined in accordance with Section 3.D and Section 4.D.
3. The company shall take into account the costs and benefits of hedge positions expected to be held by the company in the future along each scenario. Company management is responsible for developing, documenting, executing and evaluating the investment strategy for future hedge purchases. ~~Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months, including the hedging strategy, used to implement the investment policy.~~
4. For this purpose, the investment assets refer to all the assets, including derivatives supporting covered products and guarantees. This also is referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which also is referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. There is no attempt to distinguish what is the hedging portfolio and what is the investment portfolio in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.
5. This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the stochastic cash-flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

B. Modeling Approaches

1. The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two types of methods as described below. Although a hedging strategy normally would be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the ~~stochastic reserve~~SR otherwise calculated. Particular attention should be given to Section 1.B Principle 5 for the modeling of future hedging strategies.
2. The fundamental characteristic of the first type of method, referred to as the “explicit method,” is that hedging positions and their resulting cash flows are included in the stochastic cash-flow model used to determine the scenario reserve, as discussed in Section 3.D, for each scenario.

**Commented [X529]:** Section 4.A.4 (Modeling of Hedges) has some relationship with this section, we request clarification around the applicability of these two areas of hedge guidance.

**Commented [VM22530R529]:** Edits to address this comment will be reflected in next exposure

**Commented [CD531]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22532R531]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD533]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22534R533]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X535]:** We seek clarification of this text: if a company only hedges indices or separates index crediting from other hedges, does this apply, or does it only apply to any other hedging?

**Commented [VM22536R535]:** Edits to address this comment will be reflected in next exposure

**Commented [X537]:** The sentence “Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months.” seems to suggest you would do something other than the actual hedging strategy after [6] months. In this case, what are you assuming for modeling? We suggest clarification of this sentence.

**Commented [VM22538R537]:** Edits to address this comment will be reflected in next exposure

**Commented [CD539]:** is this a typo? should this be "purchases"?

**Commented [VM22540R539]:** Edits to address this comment will be reflected in next exposure

**Commented [X541]:** This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Ins: ... [131]

**Commented [VM22542R541]:** Edits to address this comment will be reflected in next exposure

**Commented [X543]:** Reinstate the original sentence which puts the reflection of hedging into the great: ... [132]

**Commented [VM22544R543]:** Edits to address this comment will be reflected in next exposure

**Commented [X545]:** Agree that the uncertainty associated with new strategies should be handled: ... [133]

**Commented [VM22546R545]:** Edits to address this comment will be reflected in next exposure

3. The fundamental characteristic of the second type of method, referred to as the “implicit method,” is that the effectiveness of the current hedging strategy on future cash flows is evaluated, in part or in whole, outside of the stochastic cash-flow model. There are multiple ways that this type of modeling can be implemented. In this case, the reduction to the ~~stochastic reserve~~SR otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.
4. Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions) on the ~~stochastic reserve~~SR needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. In addition, the reduction to the ~~stochastic reserve~~SR attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company’s ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect ~~or mock tested~~.

**Guidance Note:** No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transform some risks into others, introduce new risks, or have other imperfections. For example, a delta-only hedging strategy does not adequately hedge the risks measured by the “Greeks” other than delta.

5. A safe harbor approach is permitted for reflection of future hedging strategies supporting the contracts for those companies whose modeled hedge assets comprise only linear instruments not sensitive to implied volatility. For companies with option-based hedge strategies, electing this approach would require representing the option-based portion of the strategy as a delta-rho two-Greek hedge program. The normally modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greeks as the original option portfolio.

C. Calculation of Stochastic Reserve SR (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the future hedging strategies supporting the contracts ~~modeling of hedges~~ (including both currently held and future hedge positions) into the stochastic cash-flow model on a best efforts basis, including all of the factors and assumptions needed to ~~model the hedges~~ execute the future hedging strategies supporting the contracts (e.g., stochastic implied volatility). The determination of CTE70 (best efforts) may utilize either explicit or implicit modeling techniques.
2. The company shall calculate a CTE70 (adjusted) by recalculating the CTE70 assuming the company has ~~no future hedging strategies supporting the contracts~~ strategy except those to hedge interest credits and hedge assets held by the company on the valuation date, therefore following the requirements of Section 4.A.4.a and 4.A.4.b.i.

However, for a company with a future hedging strategy supporting the contracts, existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements may be considered in one of two ways for the CTE70 (adjusted):

**Commented [X547]:** Is delta-only hedging common in VM-22 hedging? Could the example be replaced with something more relevant to VM-22 hedging?

**Commented [X548]:** The Hedging DG is currently working on language and we will want to be consistent across VM-20, VM-21, and VM-22.

**Commented [VM22549R548]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD550]:** perhaps better to say “no future hedge purchases...”

**Commented [VM22551R550]:** Edits to address this comment will be reflected in next exposure

- a) Include the asset cash flows from any contractual payments and maturity values in the projection model; or
- b) No hedge positions – in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.

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**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company’s investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

- 3. Because most models will include at least some approximations or idealistic assumptions, CTE70 (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the value for the stochastic reserve  $SR$  is given by:

$$\text{Stochastic reserve } SR = \text{CTE70 (best efforts)} + E \times \max[0, \text{CTE70 (adjusted)} - \text{CTE70 (best efforts)}]$$

- 4. The company shall specify a value for  $E$  (the “error factor”) in the range from 5% to 100% to reflect the company’s view of the potential error resulting from the level of sophistication of the stochastic cash-flow model and its ability to properly reflect the parameters of the hedging strategy (i.e., the Greeks being covered by the strategy), as well as the associated costs, risks and benefits. The greater the ability of the stochastic model to capture all risks and uncertainties, the lower the value of  $E$ . The value of  $E$  may be as low as 5% only if the model used to determine the CTE70 (best efforts) effectively reflects all of the parameters used in the hedging strategy. If certain economic risks are not hedged, yet the model does not generate scenarios that sufficiently capture those risks,  $E$  must be in the higher end of the range, reflecting the greater likelihood of error. Likewise, simplistic hedge cash-flow models shall assume a higher likelihood of error.

- 5. The company shall conduct a formal back-test, based on an analysis of at least the most recent available relevant period of data (but no less than 12 months), to assess how well the model is able to replicate the hedging strategy in a way that supports the determination of the value used for  $E$ .

- 6. Such a back-test shall involve one of the following analyses:

- a. For companies that model hedge cash flows directly (“explicit method”), replace the stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario that represents the market path that actually manifested over the selected back-testing period and compare the projected hedge asset gains and losses against the actual hedge asset gains and losses – both realized and unrealized – observed over the same time period. For this calculation, the model assumptions may be replaced with parameters that reflect actual experience during the back-testing period. In order to isolate the comparison between the modeled hedge results and actual hedge results for this calculation, the projected liabilities should accurately reflect the actual liabilities throughout the back-testing period; therefore, adjustments that facilitate this accuracy (e.g. reflecting actual experience instead of model assumptions, including new business, etc.) are permissible.

Commented [X552]: We have been getting weak E factor support, with minimum backtesting due to the current phrasing.

Commented [X553R552]: Recommend adding stress testing language similar to Section 4.A.4.b.i.c) but with edits based on TDI’s comments/suggestions to Section 4.A.4.b.i.c).

Commented [VM22554R552]: Edits to address this comment will be reflected in next exposure

Commented [X555]: Recommend adding reporting requirement to VM-31 to disclose if company has switched between explicit method and implicit method, discuss rationale of the change and the change impact.

Commented [VM22556R555]: Edits to address this comment will be reflected in next exposure



To support the choice of a low value of E, the company should ascertain that the projected hedge asset gains and losses are within close range of 100% (e.g., 80–125%) of the actual hedge asset gains and losses. The company may also support the choice of a low value of E by achieving a high R-squared (e.g., 0.80 or higher) when using a regression analysis technique.

- b. For companies that model hedge cash flows implicitly by quantifying the cost and benefit of hedging using the fair value of the hedged item (an “implicit method” or “cost of reinsurance method”), calculate the delta, rho and vega coverage ratios in each month over the selected back-testing period in the following manner:
    - i. Determine the hedge asset gains and losses—both realized and unrealized—incurred over the month attributable to equity, interest rate, and implied volatility movements.
    - ii. Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements. The hedged item should be defined in a manner that reflects the proportion of risks hedged (e.g., if a company elects to hedge 50% of a contract’s market risks, it should quantify the fair value of the hedged item as 50% of the fair value of the contract).
    - iii. Calculate the delta coverage ratio as the ratio between (i) and (ii) attributable to equity movements.
    - iv. Calculate the rho coverage ratio as the ratio between (i) and (ii) attributable to interest rate movements.
    - v. Calculate the vega coverage ratio as the ratio between (i) and (ii) attributable to implied volatility movements.
    - vi. To support the company’s choice of a low value of E, the company should be able to demonstrate that the delta and rho coverage ratios are both within close range of 100 % (e.g., 80–125%) consistently across the back-testing period.
    - vii. In addition, the company should be able to demonstrate that the vega coverage ratio is within close range of 100 % in order to use the prevailing implied volatility levels as of the valuation date in quantifying the fair value of the hedged item for the purpose of calculating CTE70 (best efforts). Otherwise, the company shall quantify the fair value of the hedged item for the purpose of calculating CTE70 (best efforts) in a manner consistent with the realized volatility of the scenarios captured in the CTE (best efforts).
  - c. Companies that do not model hedge cash flows explicitly, but that also do not use the implicit method as outlined in Section 9.C.6.b above, shall conduct the formal back-test in a manner that allows the company to clearly illustrate the appropriateness of the selected method for reflecting the cost and benefit of hedging, as well as the value used for E.
7. A company that does not have 12 months of experience to date shall set E to a value that reflects the amount of experience available, and the degree and nature of any change to the hedge program. For a material change in strategy, with ~~no less than 126 months of~~ experience and without robust mock testing history, E should be at least 1.50. For a

material change in strategy, with no less than 3 months of history, E should be 1.0. However, when a material change in hedging strategy with less than 3 months history is the introduction of hedging for a newly introduced product or newly acquired block of business and is supplemented by robust mock testing, E should instead be at least 0.3. Moreover, with prior approval from the domestic regulator, material changes in hedge strategy with less than 3 months history but with robust mock testing may have error factors less than 1.0, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for additional uncertainty in anticipated hedging experience beyond that of a robust hedging program already in existence. However, E may be lower than 1.0-50 if some at least 6 months of reliable experience is available and/or if the change in strategy is a minor refinement rather than a substantial material change in strategy, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for any additional uncertainty associated with the refinement.

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily large (e.g.,  $\geq 5100\%$ ) for substantial changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy) without robust mock-testing where the company has not been able to provide a meaningful simulation of hedge performance based on the new strategy.
- An increase in the error factor may not always be needed for minor refinements to the hedge strategy (e.g., moving from swaps to Treasury futures).
- A temporary moderate increase (e.g., 15–30%) in error factor should be used for substantial modifications to hedge programs or modeling where meaningful simulation has not been created (e.g., adding second order hedging, such as gamma or rate convexity).
- No increase in the error factor may be used for incremental modifications to the hedge strategy (e.g., adding death benefits to a program that previously covered only living benefits, or moving from swaps to Treasury Department futures).

8. The company shall set the value of E reflecting the extent to which the future hedging program is clearly defined. To support a value of E below 1.0, there should be very robust documentation outlining the future hedging strategies program. To the extent that documentation outlining any of the future hedging strategies program is incomplete, the value of E shall be increased. In particular, the value of E shall be 1.0 if documentation is materially incomplete for any of the individual CDHS attributes (a) through (j), as listed in VM-01.

Any increases required to the value of E to reflect that documentation is not available to support that the future hedging strategies program are clearly defined shall be in addition to increases to the value of E to reflect a lack of historical experience or to reflect the backtesting results, subject to an overall ceiling of 1.0 for E.

**Guidance Note:** Companies must use judgment both in determining an E factor and in applying this requirement in the case where there are multiple future hedging strategies, particularly where some may be CDHS and some may not be CDHS. In this case, the SR should be ensured to be no less than the CTE(70) reflecting the future hedging strategies

**Commented [X557]:** 6 month restriction should be handled in the error factor. Other language for clarity. Edited guidance note below to be consistent with this.

**Commented [VM22558R557]:** Edits to create consistency with recently adopted APF 2020-12 will be considered for the next exposure

**Commented [X559]:** Work is being done by the hedging DG. This is a placeholder. Need to reflect how clearly defined and well documented the hedge program is, to be able to rely on the backtesting provided. To the extent that hedge programs are not clearly defined, E should be increased to reflect that the backtesting cannot be relied on as an indicator of future effectiveness.

**Commented [VM22560R559]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

that are CDHS and not reflecting those that are not CDHS. Companies with multiple future hedging strategies with very different levels of effectiveness or with multiple future hedging strategies that include both CDHS and non-CDHS should discuss with their domestic regulator.

E. Additional Considerations for CTE70 (best efforts)

If the company is following one or more future hedging strategies supporting the contracts-a CDHS, the fair value of the portfolio of contracts falling within the scope of these requirements shall be computed and compared to the CTE70 (best efforts) and CTE70 (adjusted). If the CTE70 (best efforts) is below both the fair value and CTE70 (adjusted), the company should be prepared to explain why that result is reasonable.

For the purposes of this analysis, the SR and fair value calculations shall be done without requiring the scenario reserve for any given scenario to be equal to or in excess of the cash surrender value in aggregate for the group of contracts modeled in the projection.

D. Specific Considerations and Requirements

1. As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the ~~stochastic reserve~~ SR, the company should review actual historical hedging effectiveness. The company shall evaluate the appropriateness of the assumptions on future trading, transaction costs, other elements of the model, the strategy, the mix of business and other items that are likely to result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, are likely to result in adverse results relative to those modeled. The parameters and assumptions shall be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model shall be modified to reflect them at either anticipated experience or adverse estimates of the parameters.

2. A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets are subject to material discontinuities. This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the fixed indexed annuity and other in-scope products account balances reach a predetermined level in relationship to the guarantees. Any hedging strategy, ~~including a delta hedging strategy,~~ can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the ~~stochastic reserve~~ SR, the company must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

Commented [X561]: Reinstated this disclosure item, which is a rough reasonability check for regulator review/information on the modeled hedge benefit and call prompt further discussion

Commented [VM22562R561]: Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

Commented [CD563]: Not sure why this section is being deleted. Perhaps references to CDHS could be deleted, but otherwise this section still seems applicable

Commented [VM22564R563]: Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

Commented [X565]: Suggest replacing "indexed" with "fixed" since this would apply to all fixed annuities

Commented [VM22566R565]: Edits to address this comment will be reflected in next exposure

Commented [X567]: Editorial change of "variable fixed indexed annuity" to be "fixed indexed annuity and other in-scope products"

Commented [VM22568R567]: Edits to address this comment will be reflected in next exposure

Commented [X569]: Recommend deleting "including a delta hedging strategy" as it is already covered by "any hedging strategy" and it is not clear if delta hedging strategy is the most common strategy in VM-22 hedging to be used as a general example

Commented [VM22570R569]: Edits to address this comment will be reflected in next exposure

3. A strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.
4. The combination of elements of the stochastic cash-flow model—including the initial actual market asset prices, prices for trading at future dates, transaction costs and other assumptions—should be analyzed by the company as to whether the stochastic cash-flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:
  - a. Hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money.
  - b. Hedging strategies that, with a given amount of initial money, never make less than accumulation at the one-period risk-free rates in any scenario but make more than this in one or more scenarios.
5. If the stochastic cash-flow model allows for such situations, the company should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the ~~stochastic reserve~~ SR otherwise calculated.
6. In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.
7. The company may also consider historical experience for similar current or past hedging programs on similar products to support the error factor determined for the projection.

Section 10: Guidance and Requirements for Setting Contract Holder Behavior Prudent Estimate Assumptions

A. General

Contract holder behavior assumptions encompass actions such as lapses, withdrawals, transfers, recurring deposits, benefit utilization, option election, etc. Contract holder behavior is difficult to predict accurately, and variance in behavior assumptions can significantly affect the ~~results~~ reserves level. In the absence of relevant and fully credible empirical data, the company should set behavior assumptions as guided by Principle 3 in Section 1.B and Section 12.

In setting behavior assumptions, the company should examine, but not be limited by, the following considerations:

1. Behavior can vary by product, market, distribution channel, index performance, interest credited (current and guaranteed rates), time/product duration, etc.
2. Options embedded in the product may affect behavior.
3. Utilization of options may be elective or non-elective in nature. Living benefits often are elective, and death benefit options are generally non-elective.
4. Elective contract holder options may be more driven by economic conditions than non-elective options.
5. As the value of a product option increases, there is an increased likelihood that contract holders will behave in a manner that maximizes their financial interest (e.g., lower lapses, higher benefit utilization, etc.).
6. Behavior formulas may have both rational and irrational components (irrational behavior is defined as situations where some contract holders may not always act in their best financial interest). The rational component should be dynamic, but the concept of rationality need not be interpreted in strict financial terms and might change over time in response to observed trends in contract holder behavior based on increased or decreased financial efficiency in exercising their contractual options.
7. ~~Options~~ that are ancillary to the primary product features ~~may or may not~~ be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many ~~thing~~ considerations, such as:
  - a. ~~For what~~ The purpose for which was the product purchased.<sup>2</sup>
  - b. ~~Is~~ Whether the option elective or non-elective.<sup>2</sup>
  - c. ~~Whether~~ Is the value of the option is well-known.<sup>2</sup>
8. ~~External influences may affect behavior.~~

B. Aggregate vs. Individual Margins

1. Prudent estimate assumptions are developed by applying a margin for uncertainty to the anticipated experience assumption. The issue of whether the level of the margin applied to the anticipated experience assumption is determined in aggregate or independently for each and every behavior assumption is discussed in Principle 3 in Section 1.B.

Commented [X571]: Editorial clarification

Commented [VM22572R571]: Edits to address this comment will be reflected in next exposure

Commented [X573]: Need general assumption setting section, see APF 2021-11.

Commented [VM22574R573]: Edits to address this comment will be reflected in next exposure

Commented [X575]: We would suggest rewording this section to be considerations rather than posed as questions.

Commented [VM22576R575]: Edits to address this comment will be reflected in next exposure

Commented [X577]: Editorial clarification

Commented [VM22578R577]: Edits to address this comment will be reflected in next exposure

Commented [X579]: Recommend adding some examples here if this is included.

Commented [VM22580R579]: Edits to address this comment will be reflected in next exposure

2. Although this principle discusses the concept of determining the level of margins in aggregate, it notes that the application of this concept shall be guided by evolving practice and expanding knowledge. From a practical standpoint, it may not always be possible to completely apply this concept to determine the level of margins in aggregate for all behavior assumptions.
3. Therefore, the company shall determine prudent estimate assumptions independently for each behavior (e.g., mortality, lapses and benefit utilization), using the requirements and guidance in this section and throughout these requirements, unless the company can demonstrate that an appropriate method was used to determine the level of margin in aggregate for two or more material behavior assumptions, if relevant to the risks in the product, and thus the approach will not understate the reserve.

C. Sensitivity Testing

The impact of behavior can vary by product, time period, etc. For any assumption that is not prescribed or stochastically modeled, the company/qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing to ensure that the assumption is set at the conservative end of the plausible range. The company shall sensitivity test:

- Surrenders.
- Partial withdrawals.
- Benefit utilization.
- Account transfers.
- Future deposits.
- Other behavior assumptions if relevant to the risks in the product.

Sensitivity testing of assumptions is required and shall be more complex than, for example, base lapse assumption plus or minus X% across all contracts. A more appropriate sensitivity test in this example might be to devise parameters in a dynamic lapse formula to reflect more out-of-the-money contracts lapsing and/or more holders of in-the-money contracts persisting and eventually using the guarantee. The company should apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the company shall use higher margins when the underlying experience is less than fully relevant and credible.

The company shall examine the results of sensitivity testing to understand the materiality of prudent estimate assumptions on the modeled reserve. The company shall update the sensitivity tests periodically as appropriate, considering the materiality of the results of the tests. The company may update the tests less frequently (but no less than every 3 years) when the tests show less sensitivity of the modeled reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company may perform sensitivity testing:

1. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.

Commented [X581]: Clarification

Commented [VM22582R581]: Edits to address this comment will be reflected in next exposure

Commented [X583]: Suggest updating bullet to "Other material behavior assumptions if relevant to the risks in the product."

Commented [VM22584R583]: Edits to address this comment will be reflected in next exposure

Commented [X585]: Sensitivity testing is covered by the submitted APF 2021-11 for VM-21, and we should be consistent. VM-21 is currently lacking on sensitivity testing

Commented [VM22586R585]: Make edits to be consistent with VM-21 APFs prior to adoption of VM-22

Commented [VM22587R585]: Edits to address this comment will be reflected in next exposure

Commented [CD588]: why assign this specifically to the QA rather than leaving it as the responsibility of "the company", like we do elsewhere in the requirements?

Commented [VM22589R588]: Edits to address this comment will be reflected in next exposure

Commented [X590]: include for completion

Commented [VM22591R590]: Edits to address this comment will be reflected in next exposure

Commented [X592]: Consistent with APF 2021-11.

Commented [VM22593R592]: Edits to address this comment will be reflected in next exposure

- 2. Using data from prior periods.

D. Specific Considerations and Requirements

- 1. Within materiality considerations, the company should consider all relevant forms of contract holder behavior and persistency, including, but not limited to, the following:
  - a. Mortality (additional guidance and requirements regarding mortality is contained in Section 11).
  - b. Surrenders.
  - c. Partial withdrawals (systematic and elective).
  - d. Account transfers (switching/exchanges).
  - e. Resets/ratchets of the guaranteed amounts (automatic and elective).
  - f. Future deposits.
  - g. Income start date for the benefit utilization.
  - h. Commutation of benefit (from periodic payment to lump sum) or vice versa.

- 2. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the calculated provisions.

For example:

- a. The impact of account transfers (intra-contract index “switching”) might be ignored, unless required under the terms of the contract (e.g., automatic ~~asset~~ re-allocation/rebalancing, ) or if the contract provisions incentivize the contract holders to transfer between accounts.
- b. Future deposits might be excluded from the model, unless required by the terms of the contracts under consideration and then only in such cases where future premiums can reasonably be anticipated (e.g., with respect to timing and amount).
- c. For some non-elective benefits (nursing home benefits for example), a zero incidence rate after the surrender charge has ended, or the cash value has depleted, may be acceptable since use of a non-zero rate could reduce the modeled reserve.

~~Guidance Note: For some non elective benefits (nursing home benefits for example), unless relevant company experience exists to the contrary, the use of incidence rates greater than zero after the surrender charge has ended, or the cash value was depleted might be inappropriate may not be prudent since it would reduce the modeled reserve.~~

- 3. However, the company should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to test the impact of a shifting asset mix and/or consider future deposits to the extent they can reasonably be anticipated and increase the calculated amounts.

Commented [X594]: Clarification

Commented [VM22595R594]: Edits to address this comment will be reflected in next exposure

Commented [X596]: clarification

Commented [VM22597R596]: Edits to address this comment will be reflected in next exposure

Commented [CD598]: delete this word

Commented [VM22599R598]: Edits to address this comment will be reflected in next exposure

Commented [X600]: Reviewing, this guidance note does not exist in the 2019, 2020, 2021, or 2022 versions of VM-21. Where is this from? Should this be added to VM-21?

4. Normally, the underlying model assumptions would differ according to the attributes of the contract being valued. This would typically mean that contract holder behavior and persistency may be expected to vary according to such characteristics as (this is not an exhaustive list):
  - a. Gender.
  - b. Attained age.
  - c. Issue age.
  - d. Contract duration.
  - e. Time to maturity.
  - f. Tax status.
  - g. Account value.
  - h. Interest credited (current and guaranteed).
  - i. Available indices.
  - j. Guaranteed benefit amounts.
  - k. Surrender charges, transaction fees or other contract charges.
  - l. Distribution channel.
5. Unless there is clear evidence to the contrary, behavior assumptions should be no less conservative than past experience. Margins for contract holder behavior assumptions shall assume, without relevant and credible experience or clear evidence to the contrary, that contract holders' efficiency will increase over time.
6. In determining contract holder behavior assumptions, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience), whether or not the segment is directly written by the company. If data from a similar business segment are used, the assumption shall be adjusted to reflect differences between the two segments. Margins shall reflect the data uncertainty associated with using data from a similar but not identical business segment.
7. Where relevant and fully credible empirical data do not exist for a given contract holder behavior assumption, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is shifted towards the conservative end of the plausible range of expected experience that serves to increase the stochastic reserve. SR. If there are no relevant data, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is at the conservative end of the range. Such adjustments shall be consistent with the definition of prudent estimate, with the principles described in Section 1.B, and with the guidance and requirements in this section.
8. Ideally, contract holder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. It is important to note, however, that contract holder behavior should neither assume that all contract holders act with 100%

**Commented [X601]:** This also applies to VM-21, as there are fixed accounts. Is there any reason not to be consistent?

**Commented [VM22602R601]:** Only to focus on VM-22 for now

**Commented [X603]:** This is not a synonym (perhaps transfer fees is a subset of transaction fees) - why would transaction fees apply for VM-21, but only transfer fees for VM-22?

**Commented [VM22604R603]:** Edits to address this comment will be reflected in next exposure

**Commented [X605]:** This section states that "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally." This text seems to directly contradict Section II. Reserve Requirements 6.H.2 which states "When advantageous, policyholders will commence living benefit payouts if not started yet." We suggest revising 6.H.2 to align with the text of 10.D.8.



efficiency in a financially rational manner nor assume that contract holders will always act irrationally. These extreme assumptions may be used for modeling efficiency if the result is more conservative.

E. Dynamic Assumptions

1. Consistent with the concept of prudent estimate assumptions described earlier, the liability model should incorporate margins for uncertainty for all risk factors that are not dynamic (i.e., the non-scenario tested assumptions) and are assumed not to vary according to the financial interest of the contract holder stochastically modeled.
2. The company should exercise care in using static assumptions when it would be more natural and reasonable appropriate to use a dynamic model or other scenario-dependent formulation for behavior. With due regard to considerations of materiality and practicality allowance for appropriate simplifications, approximations and modeling efficiency techniques, the use of dynamic models is encouraged, but not mandatory. Static assumptions Risk factors that are not scenario tested but could reasonably be expected to vary according to a stochastic process, or future states of the world (especially in response to economic drivers), may require higher margins and/or signal a need for higher margins for certain other assumptions.
3. Risk factors that are modeled dynamically should encompass the plausible range of behavior consistent with the economic scenarios and other variables in the model, including the non-scenario tested assumptions. The company shall test the sensitivity of results to understand the materiality of making alternate assumptions and follow the guidance discussed above on setting assumptions for sensitive behaviors.

F. Consistency with the CTE Level

1. All behaviors (i.e., dynamic, formulaic and non-scenario tested) should be consistent with the scenarios used in the CTE calculations (generally, the top 30% of the loss distribution). To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the company should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use prudent estimate assumptions for behavior that are reasonable and appropriate in such scenarios. For non-variable fixed annuities, these "valuation" scenarios would typically display one or more of the following attributes:
  - a. Declining, increasing and/or volatile index values, where applicable.
  - b. Price gaps and/or liquidity constraints.
  - c. Rapidly changing Volatile interest rates or persistently low interest rates.
  - d. Volatile credit spreads.
2. The behavior assumptions should be logical and consistent both individually and in aggregate, especially in the scenarios that govern the results. In other words, the company should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:

Commented [X606]: Recommend replacing "dynamic" with "stochastic." Risk factors with dynamic assumptions still need margins (although for an assumption that was part fixed and part dynamic, only one piece may have the margin but still the risk factor would have a margin).

Commented [VM22607R606]: Edits to address this comment will be reflected in next exposure

Commented [X608]: Suggest replacing "Risk factors that are not scenario tested but" with "Static assumptions that" to improve clarity in the wording.

Commented [VM22609R608]: Edits to address this comment will be reflected in next exposure

Commented [X610]: Get rid of some of the vague adjectives and be consistent with VM framework for simplifications.

Commented [VM22611R610]: Edits to address this comment will be reflected in next exposure

Commented [CD612]: "non-variable"?

Commented [VM22613R612]: Edits to address this comment will be reflected in next exposure

Commented [X614]: Editorial clarification to cover scenarios for all products/guarantees in scope

Commented [VM22615R614]: Edits to address this comment will be reflected in next exposure

Commented [X616]: Editorial for consistency with (a) above

Commented [VM22617R616]: Edits to address this comment will be reflected in next exposure

Commented [X618]: Suggesting deleting as we are not aware of dynamic credit spreads typically being modeled.

Commented [VM22619R618]: Edits to address this comment will be reflected in next exposure

- a. Remain logically and internally consistent across the scenarios tested.
  - b. Represent plausible outcomes.
  - c. Lead to appropriate, but not excessive, asset requirements.
4. The company should remember that the continuum of “plausibility” should not be confined or constrained to the outcomes and events exhibited by historic experience.
5. Companies should attempt to track experience for all assumptions that materially affect their risk profiles by collecting and maintaining the data required to conduct credible and meaningful studies of contract holder behavior.

G. Additional Considerations and Requirements for Assumptions Applicable to Guaranteed Living Benefits

Experience for contracts without guaranteed living benefits may be of limited use in setting a lapse assumption for contracts with in-the-money or at-the-money guaranteed living benefits. Such experience may only be used if it is appropriate (e.g., lapse experience on contracts without a living benefit may have relevance to the early durations of contracts with living benefits) and relevant to the business.

H. Policy Loans

If policy loans are applicable for the block of business, the company shall determine cash flows for each projection interval for policy loan assets by modeling existing loan balances either explicitly or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

1. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution:
  - a. Produces reserves that are no less than those that would be produced by modeling existing loan balances explicitly.
  - b. Complies with the contract holder behavior requirements stated in Section 10.A to Section 10.G above in this section.
2. If the company models policy loans explicitly, the company shall:
  - a. Treat policy loan activity as an aspect of contract holder behavior and subject to the requirements above in this section.
  - b. Assign loan balances either to exactly match each policy's contract's utilization or to reflect average utilization over a model segment or sub-segments if the results are materially similar.
  - c. Model policy loan interest in a manner consistent with policy contract provisions and with the scenario. Include interest paid in cash as a positive policy loan cash flow in that projection interval, but do not include interest added to the loan balance as a policy loan cash flow. (The increased balance will require increased repayment cash flows in future projection intervals.)

Commented [CD620]: Okay to keep the term "Policy Loans"

Commented [VM22621R620]: Edits to address this comment will be reflected in next exposure

Commented [X622]: Clarify reference to be more specific

Commented [VM22623R622]: Edits to address this comment will be reflected in next exposure

Commented [X624]: Editorial - VM-22 should consistently use contracts

Commented [VM22625R624]: Edits to address this comment will be reflected in next exposure

Commented [CD626]: "contract's"

Commented [VM22627R626]: Edits to address this comment will be reflected in next exposure

Commented [X628]: We have concern that reflecting average utilization may have material impact on benefit projections. Recommend adding "if the results are materially similar". This change is also applied to VM-20 and added to VM-21.

Commented [VM22629R628]: Edits to address this comment will be reflected in next exposure

Commented [X630]: Editorial - VM-22 should consistently use contracts

Commented [VM22631R630]: Edits to address this comment will be reflected in next exposure

Commented [CD632]: "contract"

Commented [VM22633R632]: Edits to address this comment will be reflected in next exposure

- d. Model policy loan principal repayments, including those that occur automatically upon death or surrender. Include policy loan principal repayments as a positive policy loan cash flow, per Section 4.A.1.h.
- e. Model ~~additional~~ policy loan principal. Include additional policy loan principal as a negative policy loan cash flow, per Section 4.A.1.h (but do not include interest added to the loan balance as a negative policy loan cash flow).
- f. Model any investment expenses allocated to policy loans and include them either with negative policy loan cash flows or insurance expense cash flows.

I. Non-Guaranteed Elements

Consistent with the definition in VM-01, Non-Guaranteed Elements (NGEs) are elements within a contract that affect ~~policy contract~~ costs or values and are not guaranteed or not determined at issue. NGEs consist of elements affecting contract holder costs or values that are both established and subject to change at the discretion of the insurer.

Examples of NGEs specific to non-variable~~fixed~~ annuities include but are not limited to the following: ~~fixed~~ the credited rates on fixed accounts, index parameters (caps, spreads, participation rates, etc.), rider fees, rider benefit features being subject to change (rollup rates, rollup period, etc.), account value charges, and dividends under participating policies or contracts.

1. Except as noted below in Section ~~10.4.5~~, the company shall include NGE in the models to project future cash flows beyond the time the company has authorized their payment or crediting.
2. The projected NGE shall reflect factors that include, but are not limited to, the following (not all of these factors will necessarily be present in all situations):
  - a. The nature of contractual guarantees.
  - b. The company's past NGE practices and established NGE policies.
  - c. The timing of any change in NGE relative to the date of recognition of a change in experience.
  - d. The benefits and risks to the company of continuing to authorize NGE.
3. Projected NGE shall be established based on projected experience consistent with how actual NGE are determined.
4. Projected levels of NGE in the cash-flow model must be consistent with the experience assumptions used in each scenario. Contract holder behavior assumptions in the model must be consistent with the NGE assumed in the model.
5. The company may exclude any portion of an NGE that:
  - a. Is not based on some aspect of the ~~policy's or~~ contract's experience.
  - b. Is authorized by the board of directors and documented in the board minutes, where the documentation includes the amount of the NGE that arises from other sources.

However, if the board has guaranteed a portion of the NGE into the future, the company must model that amount. In other words, the company cannot exclude

**Commented [CD634]:** The wording of "additional" is unclear. Does this mean maintaining a certain level of policy loan utilization throughout the projection (i.e., adding principal as repayments are made), or actually increasing policy loan utilization (i.e., adding more principal) over time? The former would seem more appropriate than the latter.

**Commented [VM22635R634]:** Edits to address this comment will be reflected in next exposure

**Commented [X636]:** Clarification

**Commented [VM22637R636]:** Edits to address this comment will be reflected in next exposure

**Commented [CD638]:** suggest: "contract holder"

**Commented [VM22639R638]:** Edits to address this comment will be reflected in next exposure

**Commented [X640]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22641R640]:** Edits to address this comment will be reflected in next exposure

**Commented [CD642]:** suggest: "are not"

**Commented [VM22643R642]:** Edits to address this comment will be reflected in next exposure

**Commented [CD644]:** suggest: "non-variable annuities"

**Commented [VM22645R644]:** Edits to address this comment will be reflected in next exposure

**Commented [X646]:** Clarity

**Commented [VM22647R646]:** Edits to address this comment will be reflected in next exposure

**Commented [X648]:** Correct section reference

**Commented [VM22649R648]:** Edits to address this comment will be reflected in next exposure

**Commented [CD650]:** delete "policy's or"

**Commented [VM22651R650]:** Edits to address this comment will be reflected in next exposure

**Commented [X652]:** Why does being authorized mean it can be excluded? This seems backwards. Does this mean it has already transpired?

from its model any NGE that the board has guaranteed for future years, even if it could have otherwise excluded them, based on this subsection.

6. The liability for contract holder dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date is reported separately from the statutory reserve. The contract holder dividends that give rise to this dividend liability as of the valuation date may or may not be included in the cash-flow model at the company's option.
  - a. If the contract holder dividends that give rise to the dividend liability are not included in the cash-flow model, then no adjustment is needed to the resulting ~~aggregate stochastic reserve~~ SR.
  - b. If the contract holder dividends that give rise to the dividend liability are included in the cash-flow model, then the resulting ~~aggregate stochastic reserve~~ SR should be reduced by the amount of the dividend liability.
7. All projected cash flows associated with NGEs shall reflect margins for adverse deviations and estimation error in prudent estimate assumptions.

Commented [CD653]: delete "aggregate"

Commented [VM22654R653]: Edits to address this comment will be reflected in next exposure

Commented [CD655]: delete "aggregate"

Commented [VM22656R655]: Edits to address this comment will be reflected in next exposure

## Section 11: Guidance and Requirements for Setting Prudent Estimate Mortality Assumptions

### A. Overview

#### 1. Intent

The guidance and requirements in this section apply to setting prudent estimate mortality assumptions when determining the stochastic reserve. SR. The intent is for prudent estimate mortality assumptions to be based on facts, circumstances and appropriate actuarial practice, with only a limited role for unsupported actuarial judgment. (Where more than one approach to appropriate actuarial practice exists, the company should select the practice that the company deems most appropriate under the circumstances.)

#### 2. Description

Prudent estimate mortality assumptions shall be determined by first developing expected mortality curves based on either available experience or published tables. Where necessary, margins shall be applied to the experience to reflect data uncertainty. The expected mortality curves shall then be adjusted based on the credibility of the experience used to determine the expected mortality curve. Section 11.B addresses guidance and requirements for determining expected mortality curves, and Section 11.C addresses guidance and requirements for adjusting the expected mortality curves to determine prudent estimate mortality.

Finally, the credibility-adjusted tables shall be adjusted for mortality improvement (where such adjustment is permitted or required) using the guidance and requirements in Section 11.D.

#### 3. Business Segments

For purposes of setting prudent estimate mortality assumptions, the products falling under the scope of these requirements shall be grouped into business segments with different mortality assumptions. The grouping, at a minimum, should differentiate between payout annuities or deferred annuity contracts that contain GLBs, and deferred annuity contracts with no guaranteed benefits or only GMDBs. Where appropriate, the grouping should also differentiate between segments which are known or expected to contain contract holders with sociodemographic, geographic, or health factors reasonably expected to impact the mortality assumptions for the segment (e.g., annuitants drawn from different countries, geographic areas, industry groups, or impaired lives on individually underwritten contracts such as structured settlements). The grouping should also generally follow the pricing, marketing, management and/or reinsurance programs of the company.

**Guidance Note:** This paragraph contemplates situations where it may be appropriate to differentiate mortality assumptions by segment or even by contract due to varying sociodemographic, geographic, or health factors. Particularly, though not exclusively, in the context of group payout annuity contracts, companies may have credible, contract-specific mortality experience data or relevant pooled data from annuitants drawn from similar industries or geographies that may be used to sub-divide inforce blocks into business segments for purposes of setting prudent estimate mortality assumptions.

For example, a company may sell group PRT contracts both to union plans in the U.S. and to private single-employer plans in another country. While both are "PRT contracts," it would be appropriate to differentiate them for mortality assumption purposes, similar to

**Commented [X657]:** Specific requirements will require further discussion, particularly what if any industry experience is identified for the SPA. Ideally, updated and appropriate assumptions should be used for better alignment and to avoid any false positives flagged as an outlier by the SPA.

**Commented [VM22658R657]:** Will address SPA separately

**Commented [X659]:** Recommend removing reference to actuarial judgment being "unsupported" from VM-21 and VM-22 because actuarial judgment should always be supportable - it is "judgment" not an arbitrary decision.

how payout annuities vs. deferred annuities are distinguished.

**Guidance Note:** Distinct mortality or liability assumptions among different contracts within a group of contracts does not in itself preclude the group of contracts from being aggregated for the purposes of the broader stochastic reserve calculation.

4. Margin for Data Uncertainty

The expected mortality curves that are determined in Section 11.B may need to include a margin for data uncertainty. The margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the provision for uncertainty to mortality. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment.

For purposes of this section, if mortality must be increased (decreased) to provide for uncertainty, the business segment is referred to as a plus (minus) mortality (longevity) segment.

It may be necessary, because of a change in the mortality risk profile of the segment, to reclassify a business segment from a mortality (longevity) plus (minus) segment to a longevity (mortality) minus (plus) segment to the extent compliance with this section requires such a reclassification. For example, a segment could require reclassification depending on whether it is gross or net of reinsurance.

B. Determination of Expected Mortality Curves

1. Experience Data

In determining expected mortality curves, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience). See Section 11.B.2 for additional considerations. Finally, if there is no data, the company shall use the applicable table, as required in Section 11.B.3.

2. Data Other Than Direct Experience

Adjustments shall be applied to the data to reflect differences between the business segments, and margins shall be applied to the adjusted expected mortality curves to reflect the data uncertainty associated with using data from a similar but not identical business segment.

To the extent the mortality of a business segment is reinsured, any mortality charges that are consistent with the company's own pricing and applicable to a substantial portion of the mortality risk also may be a reasonable starting point for the determination of the company's expected mortality curves.

3. Little or No Data Requirements

**Commented [X660]:** Recommend deleting this guidance note since it is unnecessary - there is no such restriction for any of VM-20, VM-21 or VM-22. It would be an absurd level of granular distinction, such that it is not clear you could actually perform the projection, given that assumptions vary by attained age, etc.

**Commented [VM22661R660]:** Edits to address this comment will be reflected in next exposure

**Commented [X662]:** Terming the segments "mortality (longevity) segments" would be easier to understand than "plus (minus) segments".

**Commented [VM22663R662]:** Edits to address this comment will be reflected in next exposure

**Commented [X664]:** It is unclear how to interpretate the statement and how to review it for both VM-21 and VM-22. If a company reinsures GMWB riders, then does it mean that on a net basis the segment would no longer be considered as minus? So, there would be distinct designations for the pre and post reinsurance runs? Recommend discussing the statement and adding additional language or a guidance note to make it clear.

**Commented [X665]:** Delete period, it is a typo

**Commented [VM22666R665]:** Edits to address this comment will be reflected in next exposure

**Commented [X667]:** Does this need to be edited to be consistent with "little or no" data?

**Commented [VM22668R667]:** Will be updated upon SPA assumption development

- i. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no less than:

[2021 SOA Deferred Annuity Mortality Table] with [Projection Scale G2] for individual deferred annuities that do not contain guaranteed living benefits

$$q_x^{20XX+n} = q_x^{20XX}(1 - G2_x)^n$$

- ii. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no greater than:

- a. [The appropriate percentage ( $F_x$ ) from Table 11.1 applied to the 2012 IAM Basic Mortality Table] with [Projection Scale G2] for individual payout annuity contracts and deferred annuity contracts with guaranteed living benefits

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n * F_x$$

- b. [1983 Table "a"] for structured settlements or other contracts with impaired mortality

- c. [1994 GAR Table] with [Projection Scale AA] for group annuities

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

Table 11.1

Attained Age (x)	$F_x$
<=65	80.0%
66	81.5%
67	83.0%
68	84.5%
69	86.0%
70	87.5%
71	89.0%
72	90.5%
73	92.0%
74	93.5%
75	95.0%
76	96.5%
77	98.0%
78	99.5%
79	101.0%
80	102.5%
81	104.0%

Commented [X669]: Section 11.B.3.i only has one item "a". There is no need to specifically have a single item "a". Recommend delete the notation "a" and have "Section 11.B.3.i" only.

Commented [VM22670R669]: Will be updated upon SPA assumption development

Commented [X671]: For PRT an assumption based on third-party data provider would be better than the industry table to get contract specific mortality assumptions. Is this permitted? The guidance note in A.3 seems to get at this but it's not clear in B.3.i.c whether this is allowed. This is an important distinction as PRT population can vary from those populations the tables are based upon.

Commented [VM22672R671]: Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

Commented [X673]: The 1983 Table "a" and 1994 GAR are used for structured settlements and group annuities, respectively. These tables seem to be out of date. If Standard Projected Amount work develops more granular and up to date tables, should these tables be updated to use consistent tables?

Commented [VM22674R673]: Will be updated upon SPA assumption development

Commented [X675]: The percentage factors ( $F_x$ ) are over 100% from attained age 79 to age 104. Is it appropriate to set the factors above 100% for the older ages with no credibility?

Commented [VM22676R675]: Will be updated upon SPA assumption development

Commented [CD677]: does the  $F_x$  factor need any consideration for FIAs with GLBs?

Commented [VM22678R677]: Will be updated upon SPA assumption development

82	105.5%	
83	107.0%	
84	108.5%	
85	110.0%	
86	110.0%	
87	110.0%	
88	110.0%	
89	110.0%	
90	110.0%	
91	110.0%	
92	110.0%	
93	110.0%	
94	110.0%	
95	110.0%	
96	109.0%	
97	108.0%	
98	107.0%	
99	106.0%	
100	105.0%	
101	104.0%	
102	103.0%	
103	102.0%	
104	101.0%	
>=105	100.0%	

iii. For a business segment with non-U.S. insureds, when little or no experience or information is available on a business segment, an established industry or national mortality table and mortality improvement scale may be used, with approval from the domiciliary commissioner.

4. Additional Considerations Involving Data

The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., direct data discussed in Section 11.B.1 or other than direct data discussed in Section 11.B.2).

a. Underreporting of Deaths

Mortality data shall be examined for possible underreporting of deaths. Adjustments shall be made to the data if there is any evidence of underreporting. Alternatively, exposure by lives or amounts on contracts for which death benefits were in the money may be used to determine expected mortality curves. Underreporting on such exposures should be minimal; however, this reduced subset of data will have less credibility.

b. Experience by Contract Duration

Experience of a plus segment shall be examined to determine if mortality by contract duration increases materially due to selection at issue. In the absence of information, the company shall assume that expected mortality will increase by

Commented [X679]: The phrase "When little or no experience or information is available on a business segment" is not included, unlike in (i) and (ii) of the same sub-section. It appears to be the intent that this is the only situation in which this would apply, but it would be helpful to make this explicit.

Commented [VM22680R679]: Edits to address this comment will be reflected in next exposure

Commented [X681]: Reference to the MI scale missing for international business

Commented [VM22682R681]: Edits to address this comment will be reflected in next exposure



contract duration for an appropriate select period. As an alternative, if the company determines that mortality is affected by selection, the company could apply margins to the expected mortality in such a way that the actual mortality modeled does not depend on contract duration.

c. Modification and Relevance of Data

Even for a large company, the quantity of life exposures and deaths are such that a significant amount of smoothing may be required to determine expected mortality curves from mortality experience. Expected mortality curves, when applied to the recent historic exposures (e.g., three to seven years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments.

In determining expected mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine expected mortality curves should be documented.

d. Other Considerations

In determining expected mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

C. Adjustment for Credibility to Determine Prudent Estimate Mortality

1. Adjustment for Credibility

The expected mortality curves determined in Section 11.B shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at prudent estimate mortality. The adjustment for credibility shall result in blending the expected mortality curves including margins for uncertainty with the mortality assumption assumptions described in Section 11.B.3. The approach used to adjust the curves shall suitably account for credibility.

**Guidance Note:** For example, when credibility is zero, an appropriate approach should result in a mortality assumption consistent with 100% of the industry mortality assumption described in Section 11.B.3 table used in the blending.

2. Adjustment of Statutory Valuation Industry Mortality for Improvement

For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be and the industry mortality table for a minus segment must be adjusted for mortality improvement. Such adjustment shall reflect the mortality improvement scale described in Section 11.B.3 from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the expected mortality curves.

3. Credibility Procedure

The credibility procedure used shall:

a. Produce results that are reasonable.

**Commented [X683]:** Both plan and industry data should get weighted for business such as PRT. This text says to blend with prescribed tables, but that might not make sense unless additional experience data was unavailable.

**Commented [VM22684R683]:** Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

**Commented [X685]:** Clarification

**Commented [VM22686R685]:** Edits to address this comment will be reflected in next exposure

**Commented [X687]:** Editorial

**Commented [VM22688R687]:** Edits to address this comment will be reflected in next exposure

**Commented [X689]:** The “statutory valuation” is struck out in the guidance note. Recommend replacing “statutory valuation” with either “reference of Section 11.B.3” or “industry”. Otherwise, it is a vague reference since we have both a company mortality table and an industry mortality table.

**Commented [VM22690R689]:** Edits to address this comment will be reflected in next exposure

**Commented [CD691]:** need to reference “the mortality assumption described in Section 11.B.3” here? Otherwise, the sentence is unclear.

**Commented [VM22692R691]:** Edits to address this comment will be reflected in next exposure

**Commented [X693]:** Mortality improvement should be consistent with the underlying tables used, so we would suggest this being based on available experience subject to appropriate guardrails.

**Commented [X694]:** “Statutory Valuation” was stricken from all the body, but left in this title. Consider replacing with “industry”.

**Commented [VM22695R694]:** Edits to address this comment will be reflected in next exposure

**Commented [CD696]:** for consistency, need to delete this reference to “Statutory Valuation”

**Commented [VM22697R696]:** Edits to address this comment will be reflected in next exposure

- b. Not tend to bias the results in any material way.
  - c. Be practical to implement.
  - d. Give consideration to the need to balance responsiveness and stability.
  - e. Take into account not only the level of aggregate claims but the shape of the mortality curve.
  - f. Contain criteria for full credibility and partial credibility that have a sound statistical basis and be appropriately applied.
4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement

The credibility-adjusted table used for plus segments may be and the credibility adjusted table used for minus segments must be adjusted for mortality improvement using the applicable mortality improvement scale described in Section 11.B.3 from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement beyond the valuation date is discussed in Section 11.D.

D. Future Mortality Improvement

The mortality assumption resulting from the requirements of Section 11.C shall be adjusted for mortality improvements beyond the valuation date if such an adjustment would serve to increase the resulting ~~stochastic reserve~~SR. If such an adjustment would reduce the ~~stochastic reserve~~SR, such assumptions are permitted, but not required. In either case, the assumption must be based on current relevant data with a margin for uncertainty (increasing assumed rates of improvement if that results in a higher reserve or reducing them otherwise).

Section 12: Other Guidance and Requirements for Assumptions

A. Overview

This section provides guidance and requirements in general for setting prudent estimate assumptions when determining either the SR or DR. It also provides specific guidance and requirements for expense assumptions.

B. General Assumption Requirements

1. The company shall use prudent estimate assumptions for risk factors that are not stochastically modeled by applying margins to the anticipated experience assumptions if such risk factors have been categorized as material risks by following Section 1.B Principle 3 and requirements in Section 12.C.
2. The company shall establish the prudent estimate assumptions for risk factors in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.
3. The company shall model the following risk factors stochastically unless the company elects the stochastic modeling exclusion defined in Section 7:
  - a. Interest rate movements (i.e., Treasury interest rate curves).
  - b. Equity performance (e.g., Standard & Poor's 500 index [S&P 500] returns and returns of other equity investments).
4. If the company elects to stochastically model risk factors in addition to the economic scenarios, the requirements in this section for determining prudent estimate assumptions for these risk factors do not apply.

**Guidance Note:** It is expected that companies will not stochastically model risk factors other than the economic scenarios, such as contract holder behavior or mortality, until VM-22 has more specific guidance and requirements available. Companies shall discuss with domiciliary regulators if they wish to stochastically model other risk factors.

5. The company shall use its own experience, if relevant and credible, to establish an anticipated experience assumption for any risk factor. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the anticipated experience assumption, making modifications as needed to reflect the circumstances of the company.
  - a. For risk factors (such as mortality) to which statistical credibility theory may be appropriately applied, the company shall establish anticipated experience assumptions for the risk factor by combining relevant company experience with industry experience data, tables or other applicable data in a manner that is consistent with credibility theory and accepted actuarial practice.

**Commented [X698]:** We believe discussion of allocation of appropriate reserves should be analyzed as part of the field study.

**Commented [VM22699R698]:** The VM-22 Subgroup has no objections to waiting until after the field study to determine the allocation approach.

**Commented [X700]:** Need to add a Section 12 for general guidance on prudent assumption setting and on expenses. For VM-21, APF 2021-11 is currently exposed. Should be consistent with that APF, after any tweaks are made. <https://content.naic.org/sites/default/files/minutes/APF%202021-11%20VM21%20Assumptions%2020211201.pdf>

**Commented [VM22701R700]:** Subgroup agreed on adding this as a new Section 12.

- b. For risk factors (such as utilization of guaranteed living benefits) that do not lend themselves to the use of statistical credibility theory, and for risk factors (such as some of the lapse assumptions) to which statistical credibility theory can be appropriately applied but cannot currently be applied due to lack of industry data, the company shall establish anticipated experience assumptions in a manner that is consistent with accepted actuarial practice and that reflects any available relevant company experience, any available relevant industry experience, or any other experience data that are available and relevant. Such techniques include:
    - i. Adopting standard assumptions published by professional, industry or regulatory organizations to the extent they reflect any available relevant company experience or reasonable expectations.
    - ii. Applying factors to relevant industry experience tables or other relevant data to reflect any available relevant company experience and differences in expected experience from that underlying the base tables or data due to differences between the risk characteristics of the company experience and the risk characteristics of the experience underlying the base tables or data.
    - iii. Blending any available relevant company experience with any available relevant industry experience and/or other applicable data using weightings established in a manner that is consistent with accepted actuarial practice and that reflects the risk characteristics of the underlying contracts and/or company practices.
  - c. For risk factors that have limited or no experience or other applicable data to draw upon, the assumptions shall be established using sound actuarial judgment and the most relevant data available, if such data exists.
  - d. For any assumption that is set in accordance with the requirements of Section 12.B.5.c, the qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing and disclose the analysis performed to ensure that the assumption is set at the conservative end of the plausible range.
  - e. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of statistical or other testing indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary shall set a new, adequate, anticipated experience assumption for the factor.
6. The company shall sensitivity test risk factors that are not stochastically modeled and examine the impact on the stochastic reserve. The company shall update the sensitivity tests periodically as appropriate. The company may update the tests less frequently, but no less than every 3 years, when the tests show less sensitivity of the stochastic reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company

may perform sensitivity testing:

- a. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
- b. Using data from prior periods.

**Guidance Note:** Sensitivity testing every risk factor on an annual basis is not required. For some risk factors, it may be reasonable, in lieu of sensitivity testing, to employ statistical measures for margins, such as adding one or more standard deviations to the anticipated experience assumption.

7. The company shall vary the prudent estimate assumptions from scenario to scenario within the stochastic reserve calculation in an appropriate manner to reflect the scenario-dependent risks.

#### C. Assumption Margins

The company shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed, subject to the following:

1. The level of margin applied to the anticipated experience assumptions may be determined in aggregate or independently as discussed in Section 1.B Principle 3. It is not permissible to set a margin less toward the conservative end of the spectrum to recognize, in whole or in part, implicit or prescribed margins that are present, or are believed to be present, in other risk factors.

Risks that are stochastically modeled (e.g., interest rates, equity returns) or have prescribed margins or guardrails (e.g., assets, revenue sharing) shall be considered material risks. Other risks generally considered to be material include, but are not limited to, mortality, contract holder behavior, maintenance and overhead expenses, inflation and implied volatility. In some cases, the list of material risks may also include acquisition expenses, partial withdrawals, policy loans, annuitizations, account transfers and deposits, and/or option elections that contain an element of anti-selection.

2. The greater the uncertainty in the anticipated experience assumption, the larger the required margin, with the margin added or subtracted as needed to produce a larger Sr or DR than would otherwise result. For example, the company shall use a larger margin when:

- a. The experience data have less relevance or lower credibility.
- b. The experience data are of lower quality, such as incomplete, internally inconsistent or not current.
- c. There is doubt about the reliability of the anticipated experience assumption, such as, but not limited to, recent changes in circumstances or changes in company policies.
- d. There are constraints in the modeling that limit an effective reflection of the risk factor.

Commented [X702]: [Edit for VM-22 vs. VM-21?](#)

Commented [VM22703R702]: Will include this language in the next exposure and will solicit any comments

3. In complying with the sensitivity testing requirements in Section 12.B.6 above, greater analysis and more detailed justification are needed to determine the level of uncertainty when establishing margins for risk factors that produce greater sensitivity on the stochastic reserve.
4. A margin is permitted but not required for assumptions that do not represent material risks.
5. A margin should reflect the magnitude of fluctuations in historical experience of the company for the risk factor, as appropriate.
6. The company shall apply the method used to determine the margin consistently on each valuation date but is permitted to change the method from the prior year if the rationale for the change and the impact on the stochastic reserve is disclosed.

#### D. Expense Assumptions

##### 1. General Prudent Estimate Expense Assumption Requirements

In determining prudent estimate expense assumptions, the company:

- a. May spread certain information technology development costs and other capital expenditures over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles.

**Guidance Note:** Care should be taken with regard to the potential interaction with the inflation assumption below.

- b. Shall assume that the company is a going concern.
- c. Shall choose an appropriate expense basis that properly aligns the actual expense to the assumption. If values are not significant, they may be aggregated into a different base assumption.

**Guidance Note:** For example, death benefit expenses should be modeled with an expense assumption that is per death incurred.

- d. Shall reflect the impact of inflation.
- e. Shall not assume future expense improvements.
- f. Shall not include assumptions for federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) and foreign income taxes.
- g. Shall use assumptions that are consistent with other related assumptions.
- h. Shall use fully allocated expenses.

**Guidance Note:** Expense assumptions should reflect the direct costs associated with the block of contracts being modeled, as well as indirect costs and overhead costs that have been allocated to the modeled contracts.

- i. Shall allocate expenses using an allocation method that is consistent across

company lines of business. Such allocation must be determined in a manner that is within the range of actuarial practice and methodology and consistent with applicable ASOPs. Allocations may not be done for the purpose of decreasing the stochastic reserve.

- j. Shall reflect expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger in the expense assumption only when any future costs associated with achieving the efficiencies are also recognized.

**Guidance Note:** For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past, then there would be no future expenses to reflect in the valuation.

- k. Shall reflect the direct costs associated with the contracts being modeled, as well as an appropriate portion of indirect costs and overhead (i.e., expense assumptions representing fully allocated expenses should be used), including expenses categorized in the annual statement as “taxes, licenses and fees” (Exhibit 3 of the annual statement) in the expense assumption.

- l. Shall include acquisition expenses associated with business in force as of the valuation date and significant non-recurring expenses expected to be incurred after the valuation date in the expense assumption.

- m. For contracts sold under a new policy form or due to entry into a new product line, the company shall use expense factors that are consistent with the expense factors used to determine anticipated experience assumptions for contracts from an existing block of mature contracts taking into account:

i. Any differences in the expected long-term expense levels between the block of new contacts and the block of mature contracts.

ii. That all expenses must be fully allocated as required under Section 12.D.1.h above.

2. Margins for Prudent Estimate Expense Assumptions

The company shall determine margins for expense assumptions following Section 12.C.

Section 13: Allocation of Aggregate Reserves to the Contract Level

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve. For the purpose of this section, if a contract does not have a cash surrender value, then the cash surrender value is assumed to be zero.

Contracts for which the Deterministic Certification Option is elected in Section 7.E are intended to use the methodology described in this section to allocate aggregate reserves in excess of the cash surrender value to individual contracts.

The contract-level reserve for each contract shall be the sum of the following:

- A. The contract's cash surrender value.

Drafting Note: The American Academy of Actuaries Annuity Reserves and Capital Work Group is including two potential options for allocating the excess portion of the aggregate reserve over cash surrender value: (1) Use the same approach as VM-21 (2) Allocate based on an actuarial present value calculation.

The Work Group did not reach a consensus between these two approaches, so wording for both is included in the text below. The Work Group recommends field testing both approaches and considering the results in determining future decisions.

**Option 1: VM-21 Approach**

- B. An allocated portion of the excess of the aggregate reserve over the aggregate cash surrender value shall be allocated to each contract based on a measure of the risk of that product relative to its cash surrender value in the context of the company's in force contracts (assuming zero cash value for contracts that do not contain such). The allocation shall be made separately for DR and SR. The measure of risk should consider the impact of risk mitigation programs, including hedge programs and reinsurance, that would affect the risk of the product. The specific method of assessing that risk and how it contributes to the company's aggregate reserve shall be defined by the company. The method should provide for an equitable allocation based on risk analysis.

**Commented [X704]:** This method only makes sense if done separately for the DR and SR.

- 1. As an example, consider a company with the results of the following three contracts:

Table 12.1: Sample Allocation of Aggregate Reserve

Contract (i)	1	2	3	Total
Cash Surrender Value, C	28	40	52	120
Risk adjusted measure, R	38	52	50	
Aggregate Reserve				140
Allocation Basis for the excess of the Aggregate Reserve over the Cash Surrender Value $A_i = \text{Max}(R_i - C_i, 0)$	10	12	0	22



Allocation of the excess of the Aggregate Reserve over the Cash Surrender Value $Li = (Ai) \sum Ai * [Aggregate Reserve - \sum Ci]$	9.09	10.91	0.00	20
Contract-level reserve $Ci + Li$	37.09	50.91	52.00	140.00

2. In this example, the Aggregate Reserve exceeds the aggregate Cash Surrender Value by 20. The 20 is allocated proportionally across the three contracts based on the allocation basis of the larger of (i) zero; and (ii) a risk adjusted measure based on reserve principles. Therefore, contracts 1 and 2 receive 45% (9/22) and 55% (11/22), respectively, of the excess Aggregate Reserve. As Contract 3 presents no risk in excess of its cash surrender value, it does not receive an allocation of the excess Aggregate Reserve.

**Option 2: Actuarial Present Value Approach**

B. The excess of the aggregate reserve over the aggregate cash surrender value is allocated to policies based on a calculation of the actuarial present value of projected liability cash flows in excess of the cash surrender value:

1. Discount the liability cash flows at the NAER, pursuant to requirements in Section 4, for the scenario that produces the scenario reserve closest to, but not less than the stochastic reserve  $SR$  defined in Section 3.D.
  - a. Groups of contracts that elect the Deterministic Certification Option defined in Section 7.E shall use the NAER in the single scenario used to calculate the reserve to discount liability cash flows, as well as any cash flows that are scenario dependent.
2. If the actuarial present value is less than the cash surrender value, then the excess actuarial present value to be used for allocating the excess aggregate reserve over the cash value shall be floored at zero.
  - a. If all contracts have an excess actuarial present value that is floored at zero, then use the cash surrender value to allocate any excess aggregate reserve over the aggregate cash surrender value.
3. For projecting future liability cash flows, assume the same liability assumptions that were used to calculate the stochastic reserve  $SR$  defined in Section 3.D.
4. As a hypothetical example, consider a company with the results of the following five contracts:

**Commented [X705]:** This method depends on the NAER, so would not work for companies that use direct iteration.

**Commented [X706]:** This could give an unstable allocation if there is an even mix of products with different risk profiles, so that the tail is populated with some scenarios where Product A does poorly and some where Product B does poorly. The single scenario will only reflect the riskiness of one of the products.

**Commented [X707]:** Not just the NAER, but the cashflows are also scenario dependent.

**Commented [VM22708R707]:** Edits to address this comment will be reflected in next exposure

**Commented [CD709]:** "Section 3.D"

**Commented [VM22710R709]:** Edits to address this comment will be reflected in next exposure

Table 12.1: Hypothetical Sample Allocation of Aggregate Reserve

Contract	Example Product Type	CSV* (1)	Scenario APV (2)	Excess (Floored) of the scenario APV over CSV* (3) = $\text{Max}[(2)-(1), 0]$	Aggregate Reserve CTE 70 (4)	Excess of Aggregate Reserve over Aggregate CSV* (5) = $\text{Max}[(4 \text{ Total}) - (1 \text{ Total}), 0]$	Allocated Excess Reserve (6) = (3) x $[(5 \text{ Total}) / (3 \text{ Total})]$	Total Contract Level Reserve (7) = (1) + (6)
Contract 1:	Indexed Annuity with no GLWB**	95.0	90.0	0.0			0.0	95.0
Contract 2:	Indexed Annuity with low benefit GLWB**	92.0	95.0	3.0			3.6	95.6
Contract 3:	Indexed Annuity with medium benefit GLWB**	90.0	100.0	10.0			12.0	102.0
Contract 4:	Indexed Annuity with high benefit GLWB**	88.0	105.0	17.0			20.4	108.4
Contract 5:	Fixed Life Contingent Payout Annuity	0.0	70.0	70.0			84.0	84.0
Total		365.0		100.0	485.0	120.0	120.0	485.0

\*Cash Surrender Value  
 \*\*Guaranteed Lifetime Withdrawal Benefit

**Guidance Note:** The actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

Commented [CD711]: should be " $\text{Max}[(2)-(1), 0]$ "

Commented [VM22712R711]: Edits to address this comment will be reflected in next exposure

Section 14: Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves

A. Purpose and Scope

1. These requirements define for single premium immediate annuity contracts and other similar contracts, certificates and contract features the statutory maximum valuation interest rate that complies with Model #820. These are the maximum interest rate assumption requirements to be used in the CARVM and for certain contracts, the CRVM. These requirements do not preclude the use of a lower valuation interest rate assumption by the company if such assumption produces statutory reserves at least as great as those calculated using the maximum rate defined herein.
2. The following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits arising from variable annuities, are covered in this section, and all contracts not passing the SET covered by Sections 1 through 13 of VM-22, are covered Section 14 of VM-22:
  - a. Immediate annuity contracts issued after Dec. 31, 2017;
  - b. Deferred income annuity contracts issued after Dec. 31, 2017;
  - c. Structured settlements in payout or deferred status issued after Dec. 31, 2017;
  - d. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued after Dec. 31, 2017;
  - e. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued during 2017, for fixed payouts commencing after Dec. 31, 2018, or, at the option of the company, for fixed payouts commencing after Dec. 31, 2017;
  - f. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest), issued after Dec. 31, 2017;
  - g. Fixed income payment streams, attributable to contingent deferred annuities (CDAs) issued after Dec. 31, 2017, once the underlying contract funds are exhausted;
  - h. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts issued after Dec. 31, 2017, once the contract funds are exhausted; and
  - i. Certificates with premium determination dates after Dec. 31, 2017, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders benefits upon their retirement.

**Guidance Note:** For Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f and Section 14.A.2.h above, there is no restriction on the type of contract that may give rise to the benefit.

3. Exemptions:
  - a. With the permission of the domiciliary commissioner, for the categories of annuity contracts, certificates and/or contract features in scope as outlined in Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f, Section 14.A.2.g or Section 14.A.2.h, the

**Commented [X713]:** Under A.2: need to exclude contracts being covered by the earlier sections of VM-22 not passing the exclusion tests and need a clearer reference instead of "covered in this section"

**Commented [VM22714R713]:** Edits to address this comment will be reflected in next exposure

company may use the same maximum valuation interest rate used to value the payment stream in accordance with the guidance applicable to the host contract. In order to obtain such permission, the company must demonstrate that its investment policy and practices are consistent with this approach.

4. The maximum valuation interest rates for the contracts, certificates and contract features within the scope of Section 13.14 of VM-22 supersede those described in Appendix VM-A and Appendix VM-C, but they do not otherwise change how those appendices are to be interpreted. In particular, *Actuarial Guideline IX-B—Clarification of Methods Under Standard Valuation Law for Individual Single Premium Immediate Annuities, Any Deferred Payments Associated Therewith, Some Deferred Annuities and Structured Settlements Contracts* (AG-9-B) (see VM-C) provides guidance on valuation interest rates and is, therefore, superseded by these requirements for contracts, certificates and contract features in scope. Likewise, any valuation interest rate references in *Actuarial Guideline IX-C—Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives Under Individual Single Premium Immediate Annuities* (AG-9-C) (see VM-C) are also superseded by these requirements.

#### B. Definitions

1. The term “reference period” means the length of time used in assigning the Valuation Rate Bucket for the purpose of determining the statutory maximum valuation interest rate and is determined as follows:
  - a. For contracts, certificates or contract features with life contingencies and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the earlier of: i) the date of the last non-life-contingent payment under the contract, certificate or contract feature; and ii) the date of the first life-contingent payment under the contract, certificate or contract feature, or
  - b. For contracts, certificates or contract features with no life-contingent payments and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the date of the last non-life-contingent payment under the contract, certificate or contract feature, or
  - c. For contracts, certificates or contract features where the payments are not substantially similar, the actuary should apply prudent judgment and select the Valuation Rate Bucket with Macaulay duration that is a best fit to the Macaulay duration of the payments in question.

**Guidance Note:** Contracts with installment refunds or similar features should consider the length of the installment period calculated from the premium determination date as the non-life contingent period for the purpose of determining the reference period.

**Guidance Note:** The determination in Section 13.14.B.1.c above shall be made based on the materiality of the payments that are not substantially similar relative to the life-contingent payments.

2. The term “jumbo contract” means a contract with an initial consideration equal to or greater than \$250 million. Considerations for contracts issued by an insurer to the same contract holder within 90 days shall be combined for purposes of determining whether the contracts meet this threshold.

**Guidance Note:** If multiple contracts meet this criterion in aggregate, then each contract is a jumbo contract.

3. The term “non-jumbo contract” means a contract that does not meet the definition of a jumbo contract.
4. The term “premium determination date” means the date as of which the valuation interest rate for the contract, certificate or contract feature being valued is determined.
5. The term “initial age” means the age of the annuitant as of his or her age last birthday relative to the premium determination date. For joint life contracts, certificates or contract features, the “initial age” means the initial age of the younger annuitant. If a contract, certificate or contract feature for an annuitant is being valued on a standard mortality table as an impaired annuitant, “initial age” means the rated age. If a contract, certificate or contract feature is being valued on a substandard mortality basis, “initial age” means an equivalent rated age.
6. The term “Table X spreads” means the prescribed VM-22 Section ~~13~~14 current market benchmark spreads for the quarter prior to the premium determination date, as published on the Industry tab of the NAIC website. The process used to determine Table X spreads is the same as that specified in VM-20 Appendix 2.D for Table F, except that JP Morgan and Bank of America bond spreads are averaged over the quarter rather than the last business day of the month.
7. The term “expected default cost” means a vector of annual default costs by weighted average life. This is calculated as a weighted average of the VM-20 Table A prescribed annual default costs published on the Industry tab of the NAIC website in effect for the quarter prior to the premium determination date, using the prescribed portfolio credit quality distribution as weights.
8. The term “expected spread” means a vector of spreads by weighted average life. This is calculated as a weighted average of the Table X spreads, using the prescribed portfolio credit quality distribution as weights.
9. The term “prescribed portfolio credit quality distribution” means the following credit rating distribution:
  - a. 5% Treasuries
  - b. 15% Aa bonds (5% Aa1, 5% Aa2, 5% Aa3)
  - c. 40% A bonds (13.33% A1, 13.33% A2, 13.33% A3)\*
  - d. 40% Baa bonds (13.33% Baa1, 13.33% Baa2, 13.33% Baa3)\*

\*40%/3 is used unrounded in the calculations.

### C. Determination of the Statutory Maximum Valuation Interest Rate

#### 1. Valuation Rate Buckets

- a. For the purpose of determining the statutory maximum valuation interest rate, the contract, certificate or contract feature being valued must be assigned to one of four Valuation Rate Buckets labeled A through D.
- b. If the contract, certificate or contract feature has no life contingencies, the Valuation Rate Bucket is assigned based on the length of the reference period (RP), as follows:

**Table 3-1: Assignment to Valuation Rate Bucket by Reference Period Only**

<b>RP ≤ 5 Years</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
A	B	C	D

- c. If the contract, certificate or contract feature has life contingencies, the Valuation Rate Bucket is assigned based on the length of the RP and the initial age of the annuitant, as follows:

**Table 3-2: Assignment to Valuation Rate Bucket by Reference Period and Initial Age**

<b>Initial Age</b>	<b>RP ≤ 5Y</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
<b>90+</b>	A	B	C	D
<b>80–89</b>	B	B	C	D
<b>70–79</b>	C	C	C	D
<b>&lt; 70</b>	D	D	D	D

2. Premium Determination Dates

- a. The following table specifies the decision rules for setting the premium determination date for each of the contracts, certificates and contract features listed in Section 1:

**Table 3-3: Premium Determination Dates**

<b>Section</b>	<b>Item Description</b>	<b>Premium determination date</b>
A.2.a	Immediate annuity	Date consideration is determined and committed to by contract holder
A.2.b	Deferred income annuity	Date consideration is determined and committed to by contract holder
A.2.c	Structured settlements	Date consideration is determined and committed to by contract holder
A.2.d and A.2.e	Fixed payout annuities resulting from settlement options or annuitizations from host contracts	Date consideration for benefit is determined and committed to by contract holder
A.2.f	Supplementary contracts	Date of issue of supplementary contract
A.2.g	Fixed income payment streams from CDAs, AV becomes 0	Date on which AV becomes 0
A.2.h	Fixed income payment streams from guaranteed living benefits, AV becomes 0	Date on which AV becomes 0

A.2.i	Group annuity and related certificates	Date consideration is determined and committed to by contract holder
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**Guidance Note:** For the purposes of the items in the table above, the phrase “date consideration is determined and committed to by the contract holder” should be interpreted by the company in a manner that is consistent with its standard practices. For some products, that interpretation may be the issue date or the date the premium is paid.

b. Immaterial Change in Consideration

If the premium determination date is based on the consideration, and if the consideration changes by an immaterial amount (defined as a change in present value of less than 10% and less than \$1 million) subsequent to the original premium determination date, such as due to a data correction, then the original premium determination date shall be retained. In the case of a group annuity contract where a single premium is intended to cover multiple certificates, certificates added to the contract after the premium determination date that do not trigger the company’s right to reprice the contract shall be treated as if they were included in the contract as of the premium determination date.

3. Statutory Maximum Valuation Interest Rate

- a. For a given contract, certificate or contract feature, the statutory maximum valuation interest rate is determined based on its assigned Valuation Rate Bucket (Section 14.C.1) and its Premium Determination Date (Section 14.C.2) and whether the contract associated with it is a jumbo contract or a non-jumbo contract.
- b. Statutory maximum valuation interest rates for jumbo contracts are determined and published daily by the NAIC on the Industry tab of the NAIC website. For a given premium determination date, the statutory maximum valuation interest rate is the daily statutory maximum valuation interest rate published for that premium determination date.
- c. Statutory maximum valuation interest rates for non-jumbo contracts are determined and published quarterly by the NAIC on the Industry tab of the NAIC website by the third business day of the quarter. For a given premium determination date, the statutory maximum valuation interest rate is the quarterly statutory maximum valuation interest rate published for the quarter in which the premium determination date falls.

d. Quarterly Valuation Rate:

For each Valuation Rate Bucket, the quarterly valuation rate is defined as follows:

$$I_q = R + S - D - E$$

Where:

- a. R is the reference rate for that Valuation Rate Bucket (defined in Section 14.C.4);
- b. S is the spread rate for that Valuation Rate Bucket (defined in Section 14.C.5);
- c. D is the default cost rate for that Valuation Rate Bucket (defined in Section 14.C.6);

and

d. E is the spread deduction defined as 0.25%.

e. Daily Valuation Rate:

For each Valuation Rate Bucket, the daily valuation rate is defined as follows:

$$I_d = I_q + C_{d-1} - C_q$$

Where:

- a.  $I_q$  is the quarterly valuation rate for the calendar quarter preceding the business day immediately preceding the premium determination date;
- b.  $C_{d-1}$  is the daily corporate rate (defined in Section 14.C.7) for the business day immediately preceding the premium determination date; and
- c.  $C_q$  is the average daily corporate rate (defined in Section 14.C.8) corresponding to the same period used to develop  $I_q$ .

For jumbo contracts, the daily statutory maximum valuation interest rate is the daily valuation rate ( $I_d$ ) rounded to the nearest one-hundredth of one percent (1/100 of 1%).

#### 4. Reference Rate

Reference rates are updated quarterly as described below:

- a. The “quarterly Treasury rate” is the average of the daily Treasury rates for a given maturity over the calendar quarter prior to the premium determination date. The quarterly Treasury rate is downloaded from <https://fred.stlouisfed.org>, and is rounded to two decimal places.
- b. Download the quarterly Treasury rates for two-year, five-year, 10-year and 30-year U.S. Treasuries.
- c. The reference rate for each Valuation Rate Bucket is calculated as the weighted average of the quarterly Treasury rates using Table 1 weights (defined in Section 14.C.9) effective for the calendar year in which the premium determination date falls.

#### 5. Spread

The spreads for each Valuation Rate Bucket are updated quarterly as described below:

- a. Use the Table X spreads from the NAIC website for WALs two, five, 10 and 30 years only to calculate the expected spread.
- b. Calculate the spread for each Valuation Rate Bucket, which is a weighted average of the expected spreads for WALs two, five, 10 and 30 using Table 2 weights (defined in Section 3.I) effective for the calendar year in which the premium determination date falls.

#### 6. Default costs for each Valuation Rate Bucket are updated annually as described below:

- a. Use the VM-20 prescribed annual default cost table (Table A) in effect for the quarter prior to the premium determination date for WAL two, WAL five and WAL 10 years only to calculate the expected default cost. Table A is updated and published annually on



the Industry tab of the NAIC website during the second calendar quarter and is used for premium determination dates starting in the third calendar quarter.

- b. Calculate the default cost for each Valuation Rate Bucket, which is a weighted average of the expected default costs for WAL two, WAL five and WAL 10, using Table 3 weights (defined in Section 4314.C.9) effective for the calendar year in which the premium determination date falls.

7. Daily Corporate Rate

Daily corporate rates for each valuation rate bucket are updated daily as described below:

- a. Each day, download the Bank of America Merrill Lynch U.S. corporate effective yields as of the previous business day's close for each index series shown in the sample below from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from the table below\]](https://research.stlouisfed.org/fred2/series/[replace with series name from the table below]).

**Table 3-4: Index Series Names**

Maturity	Series Name
1Y – 3Y	BAMLC1A0C13YEY
3Y – 5Y	BAMLC2A0C35YEY
5Y – 7Y	BAMLC3A0C57YEY
7Y – 10Y	BAMLC4A0C710YEY
10Y – 15Y	BAMLC7A0C1015YEY
15Y+	BAMLC8A0C15PYEY

- b. Calculate the daily corporate rate for each valuation rate bucket, which is a weighted average of the Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 4314.C.9) effective for the calendar year in which the business date immediately preceding the premium determination date falls.

8. Average Daily Corporate Rate

Average daily corporate rates are updated quarterly as described below:

- a. Download the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields for each index series shown in Section 3.G.1 from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from Section 4314.C.7.a\]](https://research.stlouisfed.org/fred2/series/[replace with series name from Section 4314.C.7.a]).

- b. Calculate the average daily corporate rate for each valuation rate bucket, which is a weighted average of the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 14.C.9) for the same calendar year as the weight tables (i.e. Tables 1, 2, and 3) used in calculating  $I_q$  in Section 14.C.3.e.

9. Weight Tables 1 through 4

The system for calculating the statutory maximum valuation interest rates relies on a set of four tables of weights that are based on duration and asset/liability cash-flow matching analysis for representative annuities within each valuation rate bucket. A given set of weight tables is applicable to the calculations for every day of the calendar year.

In the fourth quarter of each calendar year, the weights used within each valuation rate bucket for determining the applicable valuation interest rates for the following calendar year will be updated using the process described below. In each of the four tables of weights, the weights in a given row (valuation rate bucket) must add to exactly 100%.

Weight Table 1

The process for determining Table 1 weights is described below:

- a. Each valuation rate bucket has a set of representative annuity forms. These annuity forms are as follows:
  - i. Bucket A:
    - a) Single Life Annuity age 91 with 0 and five-year certain periods.
    - b) Five-year certain only.
  - ii. Bucket B:
    - a) Single Life Annuity age 80 and 85 with 0, five-year and 10-year certain periods.
    - b) 10-year certain only.
  - iii. Bucket C:
    - a) Single Life Annuity age 70 with 0 and 15-year certain periods.
    - b) Single Life Annuity age 75 with 0, 10-year and 15-year certain periods.
    - c) 15-year certain only.
  - iv. Bucket D:
    - a) Single Life Annuity age 55, 60 and 65 with 0 and 15-year certain periods.
    - b) 25-year certain only.
- b. Annual cash flows are projected assuming annuity payments are made at the end of each year. These cash flows are averaged for each valuation rate bucket across the annuity forms for that bucket using the statutory valuation mortality table in effect for the following calendar year for

individual annuities for males (ANB).

- c. The average daily rates in the third quarter for the two-year, five-year, 10-year and 30-year U.S. Treasuries are downloaded from <https://fred.stlouisfed.org> as input to calculate the present values in Step d.
- d. The average cash flows are summed into four time period groups: years 1–3, years 4–7, years 8–15 and years 16–30. (**Note:** The present value of cash flows beyond year 30 are discounted to the end of year 30 and included in the years 16–30 group. This present value is based on the lower of 3% and the 30-year Treasury rate input in Step c.)
- e. The present value of each summed cash-flow group in Step d is then calculated by using the Step 3 U.S. Treasury rates for the midpoint of that group (and using the linearly interpolated U.S. Treasury rate when necessary).
- f. The duration-weighted present value of the cash flows is determined by multiplying the present value of the cash-flow groups by the midpoint of the time period for each applicable group.
- g. Weightings for each cash-flow time period group within a valuation rate bucket are calculated by dividing the duration weighted present value of the cash flow by the sum of the duration weighted present value of cash flow for each valuation rate bucket.

Weight Tables 2 through 4

Weight Tables 2 through 4 are determined using the following process:

- i. Table 2 is identical to Table 1.
  - ii. Table 3 is based on the same set of underlying weights as Table 1, but the 10-year and 30-year columns are combined since VM-20 default rates are only published for maturities of up to 10 years.
  - iii. Table 4 is derived from Table 1 as follows:
    - a) Column 1 of Table 4 is identical to column 1 of Table 1.
    - b) Column 2 of Table 4 is 50% of column 2 of Table 1.
    - c) Column 3 of Table 4 is identical to column 2 of Table 4.
    - d) Column 4 of Table 4 is 50% of column 3 of Table 1.
    - e) Column 5 of Table 4 is identical to column 4 of Table 4.
    - f) Column 6 of Table 4 is identical to column 4 of Table 1.
10. Group Annuity Contracts

For a group annuity purchased under a retirement or deferred compensation plan (Section ~~13~~14.A.2.i), the following apply:

- a. The statutory maximum valuation interest rate shall be determined separately for each certificate, considering its premium determination date, the certificate holder's initial age, the reference period corresponding to its form of payout and whether the contract is a jumbo contract or a non-jumbo contract.

**Guidance Note:** Under some group annuity contracts, certificates may be purchased on different

dates.

- b. In the case of a certificate whose form of payout has not been elected by the beneficiary at its premium determination date, the statutory maximum valuation interest rate shall be based on the reference period corresponding to the normal form of payout as defined in the contract or as is evidenced by the underlying pension plan documents or census file. If the normal form of payout cannot be determined, the maximum valuation interest rate shall be based on the reference period corresponding to the annuity form available to the certificate holder that produces the most conservative rate.

**Guidance Note:** The statutory maximum valuation interest rate will not change when the form of payout is elected.

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Valuation Manual Section II, Reserve Requirements

Subsection 2: Annuity Products

- A. This subsection establishes reserve requirements for all contracts classified as annuity contracts as defined in SSAP No. 50 in the AP&P Manual.
- B. Minimum reserve requirements for variable annuity (VA) contracts and similar business, specified in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, shall be those provided by VM-21. The minimum reserve requirements of VM-21 are considered PBR requirements for purposes of the *Valuation Manual*.
- C. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued prior to 1/1/2024 are those requirements as found in VM-A and VM-C as applicable, with the exception of the minimum requirements for the valuation interest rate for single premium immediate annuity contracts, and other similar contracts, issued after Dec. 31, 2017, including those fixed payout annuities emanating from host contracts issued on or after Jan. 1, 2017, and on or before Dec. 31, 2017. The maximum valuation interest rate requirements for those contracts and fixed payout annuities are defined in ~~Section 13.14~~ of VM-22, Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves.
- D. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued on 1/1/2024 and later are those requirements as found in Sections 1 through ~~12~~ 13 of VM-22.

The requirements in this section are still considered a part of PBR requirements and therefore are applicable to VM-G.

The below principles may serve as key considerations for assessing whether VM 21 or VM 22 requirements apply:

- D. ~~Minimum reserve requirements apply:~~
- E. ~~Index for index-linked or modified guaranteed annuity contracts or riders that satisfy both of the following conditions may be a key consideration for application of VM 22 requirements; and are issued on 1/1/2024 and later are those requirements; as found in Sections 1 through 13 of VM-22.:~~
  - 1. Guarantees the principal amount of purchase payments, net of any partial withdrawals, and interest credited thereto, less any deduction (without regard to its timing) for sales, administrative or other expenses or charges.
  - 2. b. —Credits a rate of interest under the contract prior to the application of any market value adjustments that is at least equal to the minimum rate required to be credited by the standard nonforfeiture law in the jurisdiction in which the contract is issued.

~~Guidance Note: Paragraph E.1.b is intended to apply prior to the application of any market value adjustments for modified guaranteed annuities where the underlying assets are held in a separate account. If meeting Paragraph E.1.b prior to the application of any market value adjustments and Paragraph E.1.a above, it may be appropriate to value such contracts under VM-22 requirements.~~

Minimum reserve requirements:

Commented [X715]: We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

Commented [VM22716R715]: Waylon Peoples comment letter: Extend small company exemption in place for life PBR (VM-20) to VM-22.

Commented [VM22717R715]: The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

Commented [CD718]: "non-variable annuity"?

Commented [VM22719R718]: Edits to address this comment will be reflected in next exposure

Commented [X720]: "Section 13 of VM-22" may need to be updated if it is decided to have separate chapters for VM-22 VIR and VM-22 PBR.

Commented [VM22721R720]: Edits to address this comment will be reflected in next exposure

Commented [CD722]: "non-variable annuity"?

Commented [VM22723R722]: Edits to address this comment will be reflected in next exposure

Commented [CD724]: Consider adding the sentence: "The minimum reserve requirements of VM-22 are considered PBR requirements for purposes of the Valuation Manual." This is so VM-G will apply to VM-22, which would be appropriate.

Commented [VM22725R724]: Edits to address this comment will be reflected in next exposure

Commented [X726]: "Index-linked" annuity is not defined – only RILA and FIA in VM-22, recommend to revise the language or add a definition to define "index linked".

Commented [X727]: Recommend adding this part to E.1.b and delete the Guidance Note.

Commented [VM22728R727]: Edits to address this comment will be reflected in next exposure

for index

F. ~~2. Index-linked or modified guaranteed annuity contracts or riders that do not satisfy either of the two conditions listed above~~ criteria in Paragraph Section 2.E.1 and Section 2.E.2 above and E.1.ii may be a key consideration for application of VM-21 are issued on 1/1/2024 and later are those requirements as found in VM-21.

**Commented [X729]:** VM-21 specifically says “These requirements do not apply to contracts falling under the scope of VM-A-255: Modified Guaranteed Annuities; however, they do apply to contracts listed above that include one or more subaccounts containing features similar in nature to those contained in modified guaranteed annuities (MGAs) (e.g., market value adjustments).” Is this a contradiction?

**Commented [X730]:** Consistent with E above.

**Commented [VM22731R730]:** Edits to address this comment will be reflected in next exposure

Subsection 6: Riders and Supplemental Benefits

**Guidance Note:** Policies ~~Designs of policies~~ or contracts with riders and supplemental benefits which are created to simply disguise benefits subject to the Valuation Manual section describing the reserve methodology for the base product to which they are attached, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs with similar riders.

A. If a rider or supplemental benefit is attached to a health insurance product, deposit-type contract, or credit life or disability product, it may be valued with the base contract unless it is required to be separated by regulation or other requirements.

B. For supplemental benefits on life insurance policies or annuity contracts, including Guaranteed Insurability, Accidental Death or Disability Benefits, Convertibility, ~~Nursing Home Benefits~~ or Disability Waiver of Premium Benefits, the supplemental benefit may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, ~~VM-22~~, VM-A, and/or VM-C, as applicable.

~~C.~~ ULSG and other secondary guarantee riders on a life insurance policy shall be valued with the base policy and follow the reserve requirements for ULSG policies under VM-20, VM-A and/or VM-C, as applicable.

~~D.C.~~ ~~Any~~ any guaranteed minimum benefits on life insurance policies or annuity contracts not subject to Paragraph C above including, but not limited to, Guaranteed Minimum Accumulation Benefits, Guaranteed Minimum Death Benefits, Guaranteed Minimum Income Benefits, Guaranteed Minimum Withdrawal Benefits, Guaranteed Lifetime Income Benefits, Guaranteed Lifetime Withdrawal Benefits, Guaranteed Payout Annuity Floors, Waiver of Surrender Charges, Return of Premium, Systematic Withdrawal Benefits under Required Minimum Distributions, and all similar guaranteed benefits shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

~~E.D.~~ If a rider or supplemental benefit to a life insurance policy or annuity contract that is not addressed in Paragraphs B, C, or D above possesses any of the following attributes, the rider or supplemental benefit shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

1. The rider or supplemental benefit does not have a separately identified premium or charge.
2. After issuance, the rider or supplemental benefit premium, charge, value or benefits are determined by referencing the base policy or contract features or performance.
3. After issuance, the base policy or contract value or benefits are determined by referencing the rider or supplemental benefit features or performance. The deduction of rider or benefit premium or charge from the contract value is not sufficient for a determination by reference.

~~F.E.~~ If a term life insurance rider on the named insured[s] on the base life insurance policy does not meet the conditions of Paragraph E above, and either (1) guarantees level or near level premiums until a specified duration followed by a material premium increase; or (2) for a rider for which level or near level premiums are expected for a period followed by a material premium increase, the rider is

Commented [X732]: Still need the word "designs" otherwise this is saying the whole policy/contract was only created to disguise benefits, which would never be true.

Commented [VM22733R732]: Edits to address this comment will be reflected in next exposure

Commented [X734]: This reference is another place where there would be a benefit distinguishing the PBR sections of VM-22 from the non-PBR sections.

Commented [VM22735R734]: Edits to address this comment will be reflected in next exposure

Commented [X736]: These parallel requirements can be combined.

Commented [VM22737R736]: Edits to address this comment will be reflected in next exposure



separated from the base policy and follows the reserve requirements for term policies under VM20, VM-A and/or VM-C, as applicable.

~~G.F.~~ For all other riders or supplemental benefits on life insurance policies or annuity contracts not addressed in Paragraphs B through F above, the riders or supplemental benefits may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A and/or VM-C, as applicable. For a given rider, the election to include riders or supplemental benefits with the base policy or contract shall be determined at the policy form level, not on a policy-by-policy basis, and shall be treated consistently from year-to-year, unless otherwise approved by the domiciliary commissioner.

~~H.G.~~ Any supplemental benefits and riders offered on life insurance policies or annuity contracts that would have a material impact on the reserve (for VM-20 and VM-22) or TAR (for VM-21) if elected later in the contract life, such as joint income benefits, nursing home benefits, or withdrawal provisions on annuity contracts, shall be considered when determining reserves (for VM-20 and VM-22) or reserves and TAR (for VM-21) using the following principles:

1. Policyholders with living benefits and annuitization in the same contract will generally use the more valuable of the two benefits.
2. Unless the company has relevant and credible experience to the contrary, ~~When advantageous,~~ policyholders will commence living benefit payouts if not started yet.

**Commented [X738]:** Simplifications are judged relative to reserves for VM-20/VM-21 and TAR for VM-21.

**Commented [VM22739R738]:** Edits to address this comment will be reflected in next exposure

**Commented [X740]:** This section states that "When advantageous, policyholders will commence living benefit payouts if not started yet." This text seems to directly contradict VM-22 Section 6.H.2 which states "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally". We suggest revising 6.H.2 to align with the text of 10.D.8.

VM-01: Definitions for Terms in Requirements

- The term “Guaranteed Minimum Accumulation Benefit” (GMAB) means a guaranteed benefit providing, or resulting in the provision, that an amount payable on the contractually determined maturity date of the benefit will be increased and/or will be at least a minimum amount. Only such guarantees having the potential to produce a contractual total amount payable on benefit maturity that exceeds the account value, or in the case of an annuity providing income payments, an amount payable on benefit maturity other than continuation of any guaranteed income payments, are included in this definition.
  
- The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:
  - Increased by an amount that may be either specified by or computed from other policy or contract values; and
  - Contains either
    - The potential to produce a contractual total amount payable on such death that exceeds the account value, or
    - In the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.
  
- The term “guaranteed minimum income benefit” (GMIB) means an option under which the contractholder has the right to apply a specified minimum amount that could be greater than the amount that would otherwise be available in the absence of such benefit to provide periodic income using a specified purchase basis.

**Commented [X741]:** We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

**Commented [VM22742R741]:** The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

**Page 6: [1] Commented [X49] TDI 11/9/2021 8:56:00 AM**

Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly reflected. Recommend deleting the whole section 1.C.3 including item (a) and item (b).

**Page 6: [2] Commented [X53] TDI 11/9/2021 8:59:00 AM**

The revised language “sudden and significant levels of withdrawal and surrenders” replaces the original language “run on the bank” and is less clear. Does “significant” mean severe or extreme? Or just appreciably? Withdrawals and surrenders certainly may vary by projected economic scenarios. Recommend using the original language “run on the bank” that had a clearer intent.

**Page 7: [3] Commented [X57] ACLI**

We recommend removing the bullet “Significant future reserve increases as an unfavorable scenario is realized” as this is extraneous.

**Page 7: [4] Commented [X61] ACLI**

It seems the definitions included in this section are largely only used for the purpose of establishing the Scope in Section 2. Since this is intended to be a principles-based methodology, recommend a strong definition of "Fixed Annuity" instead of specific products underneath this business. The first paragraph in A. Scope seems to provide this with specific references which are out of scope. If changing the scope section, we would suggest deleting the various product definitions if not used elsewhere; if these definitions are potentially applied beyond VM-22, we would suggest moving any necessary definitions to VM-01.

**Page 7: [5] Commented [VM2262R61] VM-22 Subgroup 6/23/2022 9:09:00 AM**

No objections from the Subgroup to an approach that is broader and focuses less on definitions. ACLI will follow-up with proposed revisions to the scope section

**Page 7: [6] Commented [CD63] CA DOI 12/30/2021 3:11:00 PM**

The format of this Definitions section is inconsistent with other parts of the VM. In VM-01 and VM-21, each defined term is numbered, and is defined in this format (for example):

1. The term "buffer annuity" is interchangeable with the term "registered index-linked annuity (RILA)", as defined in Section 1.D.?

**Page 7: [7] Commented [X65] TDI 11/9/2021 9:04:00 AM**

The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity (RILA) since Buffer Annuity is a subset of RILA. RILA can have different downside protections such as "Buffer" or "Floor". Recommend deleting Buffer Annuity or add descriptions for Buffer Annuity as a subtype in the RILA definition.

**Page 7: [8] Commented [X67] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 7: [9] Commented [X69] TDI 11/9/2021 9:05:00 AM**

The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Page 7: [10] Commented [X71] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as FIA does there need to be guaranteed principle?

**Page 7: [11] Commented [X75] TDI 11/9/2021 9:07:00 AM**

The definition of FIA describes the account value as typically with guaranteed principal. Since FIA always has the guaranteed principal, recommend deleting the wording “typically”.

**Page 9: [12] Commented [X97] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance, it would be helpful to clarify where a longevity swap contract falls within these definitions. Notably, index-based longevity swaps should be out of scope as they do not meet definition of “annuity contract” in SSAP 50. It should also be made explicit that PRT contracts can include lump sum benefits, death benefits and cash balance benefits as well.

**Page 9: [13] Commented [VM2298R97] VM-22 Subgroup 7/13/2022 4:13:00 PM**

Academy will review this comment as part of revisiting the longevity reinsurance definition.

**Page 9: [14] Commented [X99] ACLI**

It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product from VM-22 requirements.

**Page 9: [15] Commented [VM22100R99] VM-22 Subgroup 6/23/2022 9:12:00 AM**

ACLI already following up on a proposal to address the scope and definitions, which will address this issue.

**Page 9: [16] Commented [X103] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 9: [17] Commented [X105] TDI 11/9/2021 9:06:00 AM**

The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Page 11: [18] Commented [VM22120R119] VM-22 Subgroup 6/23/2022 9:14:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [19] Commented [VM22126R123] VM-22 Subgroup 6/23/2022 9:14:00 AM**

The VM-22 Subgroup voted to adopted “Option 1” for Reserving Categories

**Page 11: [20] Commented [VM22125R123] VM-22 Subgroup 3/2/2022 4:12:00 PM**

See Equitable comment letter: supports full aggregation, but if choosing between the two exposed options for two reserving categories, prefers option 2.

**Page 11: [21] Commented [VM22124R123] VM-22 Subgroup 3/2/2022 2:59:00 PM**

See NY comment letter: supports option 1, with additional category for "other" for any other contract with supporting assets such that there is greater reinvestment and longevity risks, than disintermediation risk and other risks associated with policyholder behavior as of the valuation date.

**Page 11: [22] Commented [X123] TDI 11/9/2021 9:23:00 AM**

The reserving categories for VM-22 are not included in Scope. Recommend including the defined reserving categories in the section when outlining Scope.

**Page 11: [23] Commented [X121] ACLI**

We would support reworking this section to rely on principles, rather than definitions to determine what is in and out of scope. As product innovation continues, a simple list may not appropriately accommodate the applicability of this chapter. However, if such a list is included, then we believe it should align with the full list presented in Section 13.

**Page 11: [24] Commented [VM22122R121] VM-22 Subgroup 6/23/2022 9:16:00 AM**

ACLI will follow up with a proposed revision to the definitions and scope section

**Page 11: [25] Commented [VM22128R127] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [26] Commented [CD127] CA DOI 12/30/2021 3:27:00 PM**

suggest numbering the paragraphs within this section

**Page 11: [27] Commented [CD129] CA DOI 12/30/2021 3:27:00 PM**

suggest swapping the order of this section. That is, start with the "in scope" list, rather than the "out of scope" list.

Also, it seems like there should be specific mentions of GMDBs and GLBs, as there are in VM-21, since those guarantees can also be found on FIAs.

**Page 11: [28] Commented [VM22130R129] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [29] Commented [X131] TDI 11/9/2021 9:12:00 AM**

Since buffer annuities are a subset of RILA, recommend deleting buffer annuities.

**Page 11: [30] Commented [VM22132R131] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [31] Commented [CD133] CA DOI 12/30/2021 3:28:00 PM**

this is not defined in the Definition section. should it be?

**Page 11: [32] Commented [VM22134R133] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [33] Commented [X135] TDI 11/9/2021 9:17:00 AM**

This needs to be revised to be in line with VM-21 Section 2.A. Consider removing "such as" list and adding a cross-reference to VM-21 Section 2.A.

**Page 11: [34] Commented [VM22136R135] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [35] Commented [CD137] CA DOI 12/30/2021 3:28:00 PM**

should this be "non-variable annuities" since that is term used in Section 1.A?

**Page 11: [36] Commented [VM22138R137] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [37] Commented [VM22142R141] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [38] Commented [VM22140R139] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [39] Commented [VM22144R143] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [40] Commented [VM22146R145] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [41] Commented [CD147] CA DOI 12/30/2021 3:31:00 PM**

should this be "Non-Variable Annuity"? Otherwise, should "Fixed Annuity" be defined in the Definitions section?

**Page 11: [42] Commented [VM22148R147] VM-22 Subgroup 6/23/2022 9:18:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 12: [43] Commented [X155] TDI 11/9/2021 9:19:00 AM**

Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here is more problematic because you can be excluded from the SR but still subject to VM-22.

**Page 12: [44] Commented [X159] TDI 11/9/2021 9:25:00 AM**

We still have a question about whether RBC factors are still at an appropriate level, if principles-based capital is not developed. Were they set assuming that this reserve was at a CTE(70) level in the first place, or were they dependent on the prior framework?

**Page 12: [45] Commented [X161] TDI 11/9/2021 9:33:00 AM**

Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section references, or update proposal to have the PBR and non-PBR sections of this VM-22 draft in different chapters. After having reviewed, we think it would be much more clear to reconsider the use of "VM-23" for the PBR requirements to avoid ambiguity around scope/exclusions. The non-PBR sections also just don't seem to fit in this draft, and there is now ambiguity around whether other parts of VM-22 apply to them (scope, effective date, principles, etc.).

**Page 12: [46] Commented [VM22162R161] VM-22 Subgroup 7/19/2022 4:41:00 PM**

Subgroup discussed moving current VM-22 requirements (currently Section 14) to "VM-V". Will further discuss at the end of tier 3 comments.

**Page 12: [47] Commented [X165] TDI 11/9/2021 9:28:00 AM**

Can a company wait until the end of the transition period to start PBR, but then apply PBR to the issues from during the transition period? This was unclear for VM-20, and still seems unclear here. Need to be explicit one way or the other.

**Page 12: [48] Commented [VM22168R167] VM-22 Subgroup 6/23/2022 9:20:00 AM**

Discussed with Subgroup and decided to not have early adoption before the start of the three year transition period.

**Page 12: [49] Commented [CD167] CA DOI 12/30/2021 3:33:00 PM**

Will we (or should we) allow for any early adopters (like we did for VM-21)? It would seem reasonable to us to consider accommodating early adopters

**Page 12: [50] Commented [VM22166R165] VM-22 Subgroup 6/23/2022 9:19:00 AM**

Discussed with Subgroup and decided to keep the VM-22 language silent on this issue, similar to VM-20, leaving it to be determined on a case-by-case basis for each state.

**Page 15: [51] Commented [CD187] CA DOI 12/30/2021 3:35:00 PM**

suggest expanding header to "Stochastic Exclusion Test", for clarity

**Page 15: [52] Commented [VM22188R187] VM-22 Subgroup 7/19/2022 4:45:00 PM**

No objections from the Subgroup

**Page 15: [53] Commented [X189] ACLI**

Seems to imply that only SPIAs would pass due to the linkage to Section 13. But the reference to interest rates should be broader, if even necessary. Suggest editing as:

"these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, and VM-C, and with the statutory maximum valuation rate for immediate annuities specified in Section 13."

**Page 15: [54] Commented [VM22190R189] VM-22 Subgroup 6/23/2022 11:26:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [55] Commented [CD191] CA DOI 12/30/2021 3:36:00 PM**

Suggest rewording to just say "the stochastic exclusion test". There is only 1 SET, with 3 ways of passing it. Therefore, the current wording is confusion because it suggests that there are multiple SETs.

**Page 15: [56] Commented [VM22192R191] VM-22 Subgroup 6/23/2022 9:23:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [57] Commented [X193] ACLI**

We believe this guidance note is unnecessary as the intent of the section is clear, and the wording is possibly confusing.

**Page 15: [58] Commented [VM22194R193] VM-22 Subgroup 7/19/2022 4:46:00 PM**

No objections to removing this guidance note.

**Page 15: [59] Commented [X195] TDI 11/9/2021 9:57:00 AM**

The statement in this section is not acceptable as discussed in the previous TX comment letter. This will have the effect of potentially masking blocks that need PBR.

**Page 15: [60] Commented [VM22196R195] VM-22 Subgroup 6/23/2022 9:26:00 AM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure

**Page 15: [61] Commented [X197] ACLI**

This section seems to indicate that the grouping of contracts in exclusion testing should be the same as the grouping of contracts for aggregation. This might cause fewer product types to be qualifying for exclusion if the test must be performed at a higher level of aggregation.

**Page 15: [62] Commented [VM22198R197] VM-22 Subgroup 6/23/2022 9:27:00 AM**

Subgroup voted to use wording consistent with VM-20, which prohibits aggregating contracts with significantly different risk profiles.

**Page 15: [63] Commented [CD199] CA DOI 12/30/2021 3:42:00 PM**

for clarity, change this reference to "Section 3.D"

**Page 15: [64] Commented [VM22200R199] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [65] Commented [CD201] CA DOI 12/30/2021 3:41:00 PM**

again, suggest rewording this to just say "the stochastic exclusion test"

**Page 15: [66] Commented [VM22202R201] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [67] Commented [VM22204R203] VM-22 Subgroup 7/16/2022 9:55:00 PM**



Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure.

**Page 15: [68] Commented [X205] ACLI**

Either in this item or in Section 12 allocation to contracts not covered by PBR methodology in VM-22 needs to be addressed e.g., carve out because reserves calculated on seriatim formulaic basis.

**Page 15: [69] Commented [VM22206R205] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [70] Commented [X207] ACLI**

This sub-section seems more appropriate in Section 4 (or pulled out completely and consolidated within "I. Introduction" or "VM-01" and applied to all PBR methods).

**Page 15: [71] Commented [VM22208R207] VM-22 Subgroup 7/16/2022 9:57:00 PM**

The Subgroup decided to focus solely on VM-22 for now and hold off exploring on common principles and assumptions sections

**Page 15: [72] Commented [CD209] CA DOI 12/30/2021 3:43:00 PM**

VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques is missing (including the Guidance Note). Would it make sense to add it?

**Page 15: [73] Commented [VM22210R209] VM-22 Subgroup 7/19/2022 4:49:00 PM**

Subgroup decided to add this section.

**Page 15: [74] Commented [VM22212R211] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 18: [75] Commented [X237] TDI 11/9/2021 10:38:00 AM**

If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below.

Recommend specifying the revenue in this bullet to be gross premium since there are other revenue items that are discussed in other bullets.

**Page 18: [76] Commented [X241] ACLI**

The purpose of this guidance note is not clear as these charges would be reflected in the cash flows.

**Page 18: [77] Commented [X245] TDI 11/9/2021 10:42:00 AM**

Changed investment expense to be maintenance expense so that it does not repeat what is included in bullet h.

**Page 18: [78] Commented [X249] TDI 11/9/2021 10:41:00 AM**

Take out the revenues that covers the investment expenses and added a separate bullet under bullet "a" for other revenues.

**Page 18: [79] Commented [CD251] CA DOI 12/30/2021 3:53:00 PM**

Both net and gross cash flows have to be considered, so I don't agree with the addition of "Net" here

**Page 22: [80] Commented [VM22303R302] VM-22 Subgroup 7/5/2022 12:38:00 PM**

Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Page 35: [81] Commented [CD396] CA DOI 12/30/2021 4:09:00 PM**

should this be "stochastic reserve", since Section 4 is about determining the stochastic reserve.

**Page 35: [82] Commented [VM22397R396] VM-22 Subgroup 3/3/2022 3:08:00 PM**

Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve if not using the SET

**Page 35: [83] Commented [VM22403R402] VM-22 Subgroup 8/24/2022 4:36:00 PM**

Subgroup decided to use consistent language as the changes made to VM-21 in APF 2020-12

**Page 35: [84] Commented [X404] TDI 11/18/2021 9:44:00 PM**

Is "associated with the contracts" the same as the earlier use of "supporting the contracts"? Should the same verbiage be used here? If there is asset hedging for the assets supporting the contracts, it should be included. Need to define "solely supporting" index credits, and also have criteria on the effectiveness/error and documentation of any such hedging that is allowed for excluded business.

**Page 35: [85] Commented [VM22405R404] VM-22 Subgroup 8/24/2022 4:36:00 PM**

Academy will consider potential language to be more specific with respect to "hedging programs solely supporting index credits" during the upcoming exposure period

**Page 35: [86] Commented [VM22406] VM-22 Subgroup 6/23/2022 1:16:00 PM**

Subgroup voted to permit SPIAs below a certain duration to automatically pass the exclusion test, assuming there is limited optionality, level/near-level payments, and not PRT or longevity reinsurance. The Academy has agreed to develop a proposed duration threshold.

**Page 35: [87] Commented [VM22407] VM-22 Subgroup 7/5/2022 4:21:00 PM**

New language drafted by select Subgroup Members to provide certain conditions under which SPIA contracts could automatically pass the exclusion test

**Page 35: [88] Commented [VM22408R407] VM-22 Subgroup 8/24/2022 4:37:00 PM**

Academy will provide a proposed durational threshold in this language during the next exposure.

**Page 35: [89] Commented [CD409] CA DOI 12/30/2021 4:11:00 PM**

Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstration or Certifications). The language gets confusing (here and elsewhere) when you start saying there are different "types" of SETs.

**Page 36: [90] Commented [CD411] CA DOI 12/30/2021 4:11:00 PM**

not sure why this part is deleted. Suggest adding it back in.

**Page 36: [91] Commented [VM22412R411] VM-22 Subgroup 6/23/2022 10:10:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [92] Commented [X413] ACLI**

We recommend removing "pension risk transfer business" from products scoped out of SET certification method. It is unclear why this business would be treated differently from individually issued business for testing intended to capture interest rate risk.

**Page 36: [93] Commented [VM22414R413] VM-22 Subgroup 3/2/2022 2:51:00 PM**

Subgroup voted to keep PRT ineligible for the Certification Method

**Page 36: [94] Commented [CD415] CA DOI 12/30/2021 4:12:00 PM**

See earlier comments about the use of "future"

**Page 36: [95] Commented [VM22416R415] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 36: [96] Commented [VM22418R417] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 36: [97] Commented [VM22422R421] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [98] Commented [VM22420R419] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [99] Commented [CD423] CA DOI 12/30/2021 4:14:00 PM**

what is meant by "aggregate risk levels"? Aggregated across what? Need clarification on the intentions for adding this phrase, when it is not in VM-20. Otherwise, i would suggest deleting this.

**Page 36: [100] Commented [VM22424R423] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [101] Commented [X425] TDI 11/18/2021 9:49:00 PM**

This is not in VM-20 and would substantially change the exclusion. The intent is not to allow you to group a block that has material interest rate risk with a larger block that is insensitive to interest rate risks and thereby pass. If "aggregate" referred to potential compounding of interest rate, longevity, or asset risk then this could be redrafted

to clearly call out a 4th category of risk due to a combination of the first three. However, I think this is already implicitly covered.

**Page 36: [102] Commented [VM22426R425] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [103] Commented [VM22428R427] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [104] Commented [CD429] CA DOI 12/30/2021 4:15:00 PM**

note, there is no insertion of "aggregate risk levels across" here, like there was above. (to be clear, i don't support adding it.)

**Page 36: [105] Commented [VM22430R429] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [106] Commented [CD431] CA DOI 12/30/2021 4:16:00 PM**

This wording is a little clunky here. My suggestion:

"A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great..."

**Page 36: [107] Commented [VM22432R431] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [108] Commented [VM22434R433] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [109] Commented [X433] TDI 9/7/2021 9:28:00 AM**

Replace all "contracts" with "contracts and certificates"

**Page 36: [110] Commented [VM22436R435] VM-22 Subgroup 8/24/2022 8:12:00 PM**

No objections from Subgroup members

**Page 36: [111] Commented [VM22438R437] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [112] Commented [VM22440R439] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [113] Commented [VM22442R441] VM-22 Subgroup 6/23/2022 1:36:00 PM**

Edits to address this comment will be reflected in next exposure

**Page 36: [114] Commented [X443] TDI 11/18/2021 10:37:00 PM**

Need to add a review of the company's mortality and/or longevity risk.

**Page 36: [115] Commented [VM22444R443] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [116] Commented [X445] ACLI**

As written, the SERT assumes a single premium product given the change of the denominator to the scenario reserve. Alternative product designs (such as longevity swap) could result in unintended results. We recommend maintaining consistency with VM-20 and using a denominator of future benefits (annuity payments, DBs, etc., excluding premium considerations, expenses, etc.).

**Page 36: [117] Commented [VM22446R445] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 36: [118] Commented [X447] TDI 11/18/2021 9:53:00 PM**

Using (a) in the denominator instead of VM-20's (c) which is a PV of benefits could make this ratio unstable when the scenario reserve (a) is very small. This is particularly applicable if the block being tested does not have CSV.

**Page 36: [119] Commented [VM22448R447] VM-22 Subgroup 6/23/2022 10:13:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 36: [120] Commented [X449] TDI 11/18/2021 9:59:00 PM**

The variability should be assured to be immaterial based on the company's materiality standard.

**Page 36: [121] Commented [VM22450R449] VM-22 Subgroup 8/24/2022 8:12:00 PM**

No objections from Subgroup members, but made modification to change "greater" to "lesser", in line with the intention

**Page 37: [122] Commented [VM22472R471] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [123] Commented [CD471] CA DOI 12/30/2021 4:18:00 PM**

better to keep the reference to the full Section (i.e., Section 7.C.1)

**Page 37: [124] Commented [VM22470R469] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [125] Commented [VM22474R473] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [126] Commented [CD473] CA DOI 12/30/2021 4:20:00 PM**

why delete this? seems like it wouldn't hurt to keep this language, for additional clarity

**Page 37: [127] Commented [X475] TDI 11/18/2021 10:09:00 PM**

Be consistent with standard VM references

**Page 37: [128] Commented [VM22476R475] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [129] Commented [CD477] CA DOI 12/30/2021 4:20:00 PM**

better to reference the full Section (i.e., Section 7.C.1.b)

**Page 37: [130] Commented [VM22478R477] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 43: [131] Commented [X541] TDI 11/19/2021 8:39:00 AM**

This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Instead, this should be addressed through the Error factor for new programs being temporarily larger.

**Page 43: [132] Commented [X543] TDI 11/19/2021 8:50:00 AM**

Reinstate the original sentence which puts the reflection of hedging into the greater context of reflecting the company's investment policy.

**Page 43: [133] Commented [X545] TDI 11/19/2021 8:42:00 AM**

Agree that the uncertainty associated with new strategies should be handled via the E factor, not through blanket exclusion.

Draft: 9/7/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
August 24, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Aug. 24, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Ahmad Kamil, Elaine Lam, and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); and Tomasz Serbinowski (UT).

1. Reviewed the VM-22 Project Timeline

Mr. Slutsker reviewed the VM-22 project timeline and comment log (Attachment Twenty-Eight-A). He said the Subgroup will continue to work through the remaining comments over the next few meetings. He said the longevity risk reinsurance exposure will be addressed after completion of the comment log.

2. Discussed Tier Three Comments in the VM-22 Draft

The Subgroup continued to review tier three comments on the proposed VM-22 framework (Attachment Twenty-Eight-B). Mr. Slutsker said the Texas Department of Insurance (TDI) comment on the final paragraph of Section 4.B.1 will be edited to clarify that the scenario reserve floor should be no lower than the sum of the cash surrender value and the market value adjustment (MVA).

Mr. Slutsker asked the American Council of Life Insurers (ACLI) whether its comment on Section 4.B.3.a is asking for a change in the wording of the paragraph. Brian Bayerle (ACLI) agreed to discuss the issue with ACLI members.

Mr. Slutsker said that changes were made to Section 4.B.3.b.iv in response to comments from the TDI and the California Department of Insurance (CDI) suggesting that the phrase “unreasonably high” be replaced, which defined guardrails.

Mr. Slutsker said discussion of the comments on Section 6 related to the standard projection amount (SPA) will be deferred until there is a Subgroup meeting committed solely to discussion of the SPA.

Mr. Slutsker said the TDI comment on Section 7.A.1.c suggests defining the phrases “associated with the contracts” and “supporting the contracts.” The comment noted that if the phrases are equivalent, the Subgroup should be consistent in using one phrase or the other. He said the TDI comment also suggests that the term “solely supporting” be defined. Chris Conrad (American Academy of Actuaries—Academy) said the Academy will review the wording of the section.

Mr. Slutsker said new language was added to Section 7.A.1.d that lists criteria for passing the stochastic exclusion test. Mr. Conrad said the Academy is considering what duration might be a suitable cutoff to use in the test.

Mr. Slutsker reviewed the TDI comment suggesting that for the stochastic exclusion test (SET) certification method demonstration in Section 7.B.3.a, the alternative use of the New York seven economic scenarios (ESGs) should be conducted under each of the three mortality adjustment factors in Section 7.C.1. He said the TDI also commented on the need to reference a company’s materiality standard in the stochastic exclusion ratio test (SERT) demonstration in Section 7.C.1. He said the language proposed by the TDI will be included in the next exposure.

Mr. Bayerle said the ACLI comment in Section 7.C.3 asks for clarification of the term “non-proportional reinsurance” in either the Definition section or in a guidance note. Mr. Slutsker asked if examples could be provided in lieu of a definition. Sheldon Summers (Claire Thinking) said that years ago during discussions related to revising the *Life and Health Reinsurance Agreements Model Regulation* (#791) to address the application of yearly renewable term insurance to group life contracts, it was decided that experience refunds would not cause proportional reinsurance agreements to become nonproportional. Mr. Summers suggested that any examples should include a reference to that decision. Reggie Mazyck (NAIC) suggested that a guidance note pointing to the question and answer (Q&A) document supporting Model #791 reference could satisfy Mr. Summers’ request. Robin Marcotte (NAIC) agreed to search for the proper reference.

Mr. Bayerle said the ACLI will review its comment on Section 7.D.1.a and Section 7.D.2.a to determine whether its intent is to suggest the deletion of the two paragraphs or the entire Section 7.D. Mr. Slutsker suggested the ACLI consider whether a guidance note explaining the two paragraphs would be a sufficient alternative.

Having no further business, the VM-22 (A) Subgroup adjourned.

[https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/08 24/8\\_24 VM-22 Minutes.docx](https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/08 24/8_24 VM-22 Minutes.docx)



**PBR VM-22 Project Draft Timeline**

(updated 7/19/22)

EFFECTIVE DATE GOALS	PBR VM-22 effective with three year transition period												PBR VM-22 mandatory prospectively																										
	1/1/2025						1/1/2028						1/1/2028																										
DRAFT TIMELINE	12 21	1 22	2 22	3 22	4 22	5 22	6 22	7 22	8 22	9 22	10 22	11 22	12 22	1 23	2 23	3 23	4 23	5 23	6 23	7 23	8 23	9 23	10 23	11 23	12 23	1 24	2 24	3 24	4 24	5 24	6 24	7 24	8 24						
SPA DG - develop assumptions/methodology																																							
VM22 SG calls - Address comment letters and edits																																							
ESG Field Test #1																																							
NAIC National Meeting August 9-13, Portland																																							
VM-22 exposure (90 days preferable)																																							
SPA Discussions at VM-22 Subgroup																																							
NAIC National Meeting December 12 - 15, Tampa FL																																							
VM-31 SG meetings to prepare recommendation																																							
VM-22 Field Test Final exposure & preparations																																							
Discuss comments from Fall VM-22 draft exposure																																							
ESG Field Test #2 (timeline estimate)																																							
VM-22 and C3P1 Field Test																																							
Compile/analyze Field Test results																																							
Discuss field test results on public calls																																							
Resolve outstanding items and changes from field test																																							
LATF exposure and discussion of comments																																							
LATF Adoption																																							
A Committee Adoption																																							
NAIC Exec & Plenary Adoption																																							

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
1	VM-22 Scope and Definitions	Keep current definitions for what is in-scope or focus only on non-variable annuities out of scope	4/13/2022	1	Openness to use Section II of the Valuation Manual to determine scope rather than relying on definitions; ACLI to provide potential draft wording
2	Reserving categories and aggregation	Determine Option 1 or Option 2 from exposed reserve category definitions	4/13/2022	1	Preliminary vote to pursue Option 1
3	Small Company Exemption	Fixed Annuity PBR exemption, similar to life PBR exemption for smaller carriers?	4/13/2022	1	Voted to pursue a "Fixed Annuity PBR Exemption"; ACLI to propose a set of potential draft criteria for the exemption
4	Reinvestment Guardrail	Keep VM-20/VM-21 mix, Academy mix, TX mix, or other? Wait until field test for final decision?	4/27/2022	1	Wait until observing impact in field testing results before voting on a reinvestment mix guardrail
5	Principles & Risks Across VM Chapters	Build one section in the Valuation Manual for principles that apply to VM-20, VM-21, and VM-22	4/27/2022	2	Openness to interested party proposals for a common "principles" section, but will focus on working through other VM-22 decisions before exploring
6	General Assumptions Section	Add a section to the VM-22 draft on general considerations and requirements for assumption	4/27/2022	2	Will include a proposed general assumptions section ("Section 13") from Texas, to be consistent with a recent APF adoption on VM-21
7	Transition Period	Permit 1) early adoption and 2) retrospective adoption to the start of the 3-year transition period?	4/27/2022	2	Decided to not pursue early adoption; VM-22 will stay silent on retrospective adoption to start of transition period, similar to VM-20
8	Minimum Error for Index Credit Hedges	What should be the minimum breakage expense (i.e., error) for modeling hedges supporting index credits?	5/11/2022	2	Will wait until seeing field testing results before minimum threshold
9	Longevity Reinsurance	How should longevity reinsurance be defined and treat negative reserves/recurring premiums?	5/11/2022	2	Academy presented on longevity reinsurance and will provide a refined definition; New Jersey proposal is exposed for reserving requirements
10	Categories for VM-31 Disclosures	What level of granularity should be required for disclosing PBR reserves for product groups in VM-31?	5/11/2022	2	Will wait until seeing field testing results before determining granularity of disclosures
11	Exclusion Test: SPIA contracts	Allow SPIAs to have the option of PBR vs. pre-PBR valuation without an exclusion test?	6/1/2022	2	Voted to allow SPIAs automatically pass exclusion testing, subject to criteria around optionality and a liability duration threshold (TBD)
12	Exclusion Test: PRT Certification Method	Allow PRT contracts to use the Certification Method for exclusion testing?	6/1/2022	2	Do not allow PRT to undergo the Certification Method
13	Exclusion Test: Grouping	Group between products with significantly different risk profiles?	6/1/2022	2	Do not allow grouping between products with significantly different risk profiles, consistent with VM-20 and TDI's proposal
14	Exclusion Test: Future Premiums	For the stochastic exclusion ratio test, determine whether to include future premiums	6/1/2022	2	Include future premiums in the numerator, but only benefits and expenses in the denominator, consistent with VM-20.
15	Exclusion Test: Deterministic Reserve	To pass the deterministic test, does the company need to pass or disclose 16 scenarios with baseline mortality?	6/1/2022	2	Require passing the ratio test for 16 economic scenarios under 100% of the anticipated experience mortality assumption
17	Import Reinsurance Wording from VM-20	Import VM-20 wording on incorporating contractual or additional characteristics for modeling reinsurance?	6/14/2022	2	Include proposed wording from VM-20
18	Fair Value Certification	Include fair value certification, similar to existing VM-21 requirement?	6/14/2022	2	Include fair value certification disclosure for non-index credit hedging programs
16	PRT Mortality	Permit PRT mortality with limited credibility to follow a third-party provider instead of an industry table?	6/14/2022	2	Voted in favor of using a prescribed table; do not permit a third party table upon limited credibility
19	Allocation Method	Determine Option 1 or Option 2? Wait until observing field test results before deciding?	6/29/2022	2	Wait until field test results and further research by ACLI on tax implications prior to revisiting

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
20	Working Reserve	Use a working reserve concept to serve as a floor for contracts without cash surrender value?	6/29/2022	2	Academy will work on a working reserve concept for contracts without cash surrender value, though may be little impact due to reserving categories
21	Grouping for Fund Value Depletion	Appropriate reserving category for deferred annuities with GNMWBS/GMIBs that have depleted fund value	6/29/2022	2	Decided to leave these contracts in the "Payout Reserving Category" for now, but will add a drafting note to solicit feedback an optional approach
22	RBC Guidance Note	Retain the guidance note in VM-21 that discusses the relationship between reserves and RBC?	TBD	3	ACL will provide the full text for the Subgroup to consider
23	Principle 1	Should the edits to Principle 1 for VM-22 be incorporated into VM-21 as well?	TBD	3	For now, will plan to focus only on VM-22, as LATF can explore the other VM chapters upon the Subgroup's recommendation of the VM-22 draft to LATF
24	Principle 2	Does setting an SR to be reasonably conservative over a span of economic cycles contradict other principles?	TBD	3	ACL will provide the full text for the Subgroup to consider
25	Aggregation Limits	Guidance note stating aggregation may not be possible for experience rated group and reinsurance treaties	TBD	3	Will include this text in the VM-22 draft
26	Principle 3	Delete "Generally, assumptions are to be based on the conservative end of the confidence interval"?	TBD	3	Retain this language
27	Principle 5	Delete sentence about the principle to not reduce the reserve unless reducing the risk?	TBD	3	Retain this language
28	Risks not reflected	Retain or remove the list of "Risks not reflected" in VM-22?	TBD	3	Remove subsection 3, but keep section 4 and update title to include "risks not reflected"
29	Separate Account References	Recommendation to delete all references to "separate accounts" in VM-22	TBD	3	For now, will keep references to "separate accounts" and will add a drafting note to solicit feedback
30	Combination Risks	Proposal to delete "Risks modeled in the company's risk assessment processes that are related to the contracts"	TBD	3	Retain this language
31	Immaterial Risks	Recommendation to delete sentence about not reflecting risks that do not materially affect the reserves	TBD	3	Remove this language
32	Liquidity Risk	Refer to liquidity risks for "run on bank" or "sudden and significant levels of withdrawals and surrenders"	TBD	3	Use the "run on bank" description
33	Significant Future Reserve Increases	Strike this item from the list of risks not reflected?	TBD	3	Retain this language
34	Fixed Annuity Definition	Need to define a "fixed annuity"?	TBD	3	Will replace all references to "fixed annuity" with "non-variable annuity"
35	Longevity Swaps	Are these contracts included in the definition of PRT?	TBD	3	As a follow-up, Academy will include reviewing the definition of PRT when revisiting the definition of longevity risk
36	CSV and GMDB definitions	Retain VM-21 definitions for "cash surrender value" and "guaranteed minimum death benefits"?	TBD	3	Will not retain the definition for "cash surrender value" and will move the "guaranteed minimum death benefits" to VM-01
37	Assumed reserve level for RBC	Question whether CTE70 was the assumed level for reserves upon determining RBC	TBD	3	Question relates to RBC, and therefore did not discuss as part of the VM-22 Subgroup
38	VM-23	Consider reinstating "VM-23" to avoid confusion around the where exemptions/exclusions point to vs. PBR?	TBD	3	Subgroup discussed moving current VM-22 requirements (currently Section 14) to "VM-V". Will further discuss at the end of tier 3 comments

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
39	Pre-Reinsurance	Request to develop further guidance around pre-reinsurance	TBD	3	ACL will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure
40	Deterministic Reserve	Use this term for the single scenario reserve calculated upon passing the deterministic exclusion test?	TBD	3	Will replace "scenario reserve" with "deterministic reserve". Also added "aggregate minimum reserve" as the term for the final reserve
41	Deterministic Certification Option	Keep this terminology or change?	TBD	3	Given that the term "deterministic reserve" will not be used, decided to keep this terminology
42	Stochastic Exclusion Test	Change Section 3.E to "Stochastic Exclusion Test" header?	TBD	3	Accepted comment and made change to update header
43	Guidance Note for Exclusion Test	Remove the guidance note that clarifies that AG33/AG35 may be used upon passing the exclusion test	TBD	3	Decided to remove this guidance note
44	Prudent Estimate Assumptions	Move Section 3.G to Section 4 of the document?	TBD	3	Subgroup decided to hold off for now
45	Simplifications	Port over VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques?	TBD	3	Subgroup agreed to add this wording for simplifications, to be consistency with VM-21
46	Review experience every three years?	Make this a requirement for the qualified actuary?	TBD	3	Subgroup agreed to include a requirement to review experience every three years
47	Simplification example for the SPA	Add an example of a simplification for the SPA upon development	TBD	3	Delete for now and revisit upon development of the SPA
48	Stochastic Mortality	Consider including stochastic mortality in the stochastic reserve for longevity reinsurance?	TBD	3	Subgroup agreed to port over VM-20 language on stochastic modeling when static prudent estimates are not appropriate for liability assumptions
49	NVA Guidance Note	Is the market value adjustment guidance note from VM-21 still appropriate for VM-22?	TBD	3	Subgroup decided to remove guidance note
50	Hedging Reorganization	Move parts of Section 4.A.4 to Section 9, which covers hedging	TBD	3	Open to comments on restructuring this section during the next exposure
51	Future Hedging Programs	Align VM-22 draft to be consistent with APF 2020-12 adopted edits for VM-21?	TBD	3	Subgroup decided to be consistent with APF 2020-12 language
52	Index Credit Hedge Margin	Does this reflect both model risk and real-world error? How does stress testing justify the error?	TBD	3	Wording is added to state that both sources of error are reflected in the margin; in addition the reference to stress testing will be removed
53	Paragraph on Hedging	Remove this paragraph if included in another section, even upon edits from TDJ/OPBR?	TBD	3	Open to comments on restructuring this section during the next exposure
54	Revenue Sharing	Is the section of revenue sharing applicable to non-variable products?	TBD	3	Decided to retain this section
55	Projection Period	Use consistent language with VM-20?	TBD	3	Kept the first sentence to be consistent with VM-20, but removed the second proposed sentence, since now the approximation section has been added
56	PIMR	Include pre-tax IMR in VM-22?	TBD	3	Refer to LATF
57	NVA on CSV Floor	Apply the market value adjustment factor to the cash surrender value reserve floor for applicable products?	TBD	3	

**NAIC VM-22 Drafting Discussion Log**

#	Topic	Description	Date	Tier	Outcome
58	Consistency with Managed Business	Modify NAER requirement to have assets modeled in a manner consistent with how business is managed?	TBD	3	
59	Limits on NAER	Define a specific cap or floor for the NAER instead of saying it should not be "unreasonably high"?	TBD	3	
60	Reserve Floor	NY comment on using CARVM as a reserve floor	TBD	3	
61	Longevity Reinsurance & SPA	Require the k-factor approach to address negative reserve issue for longevity reinsurance in SPA?	TBD	3	
62	Longevity Reinsurance & Exclusion Testing Standard Projection Amount	Require the k-factor approach or something similar for longevity reinsurance in exclusion testing? Equitable comment on supporting SPA with company assumptions insignificant risk factors	TBD	3	
63	Exclusion Testing & SPA	Modify exclusion test to address the standard projection amount?	TBD	3	
64	Hedging eligibility for exclusion testing	Refine wording around the restriction for not allowing blocks with hedging programs to use exclusion testing? If using the NY7 for the Certification Method, add mortality stress scenarios?	TBD	3	
65	Mortality Stress Tests		TBD	3	
66	Mortality Shock	Include the mortality shock for the ratio test based on the company materiality standard if more restrictive? Include the baseline mortality test in determining the exclusion test?	TBD	3	
67	Baseline Mortality Test	Include note on number of exclusion test permutations for clarity?	TBD	3	
68	Permutations		TBD	3	
69	Non-Proportional Reinsurance	Retain section on non-proportional reinsurance?	TBD	3	
70	SERT if Other Tests Fail	Prohibit passing the SERT if the demonstration test fails?	TBD	3	
71	Demonstration Test	Remove options in 1.a and 2.a?	TBD	3	
72	Deterministic Exclusion for SPA	Consider SPA for the deterministic exclusion test	TBD	3	
73	Deterministic Exclusion Scenario	Consider disintermediation risk for the SPA scenario?	TBD	3	
74	SPIA Guidance Note	Remove guidance note specifying that the deterministic exclusion test generally applies to SPIAs? Replace or remove example about delta hedging for VM-22?	TBD	3	
75	Delta Hedging		TBD	3	

**NAIC VM-22 Drafting Discussion Log**

#	Topic	Description	Date	Tier	Outcome
77	Policyholder Behavior Considerations	Suggestion to re-word as considerations instead of questions?	TBD	3	
78	Non-Elective Benefits	Remove guidance note to limit modeling non-elective benefits after CSV is depleted if reducing reserves?	TBD	3	
79	100% Policyholder Efficiency	Assuming 100% policyholder inefficiency contradicts VM Section II 6.H.2, so revise VM Section II?	TBD	3	
80	NGE Board of Directors	Comment that only allowing NGE exclusion if approved by the Board does not necessarily seem reasonable	TBD	3	
81	Unsupported Judgement	Comment to remove the reference to using "unsupported actuarial judgement" from Section 11	TBD	3	
82	Mortality and Reinsurance	Does Section 11.A require evaluation of a plus vs. minus segment differently for pre- vs. post reinsurance?	TBD	3	
83	Little or No Data	Does "little or no data" need to be in the header of Section 11.B.3?	TBD	3	
84	Improvement with Limited Experience	Consider not only credibility blending the base mortality assumption but also the improvement assumption	TBD	3	
85	Option 1 DR vs SR	Require separate allocation for DR vs. SR for allocation Option 1 (Section 13)?	TBD	3	
86	Option 2 for Direct Iteration Method	Option 2 is not designed to work for the Direct Iteration Method	TBD	3	
87	Option 2 Single Scenario	Could produce unstable allocation when products with different risk profiles are aggregated for PRR	TBD	3	
88	Index-linked annuity	This term is used in the proposed Section II, Subsection 2 draft, but is not defined	TBD	3	
89	Modified Guaranteed Annuities (MGAs)	VM-21 has language that exempts contracts falling under scope of MDL-255, does this contradict Section II edits?	TBD	3	

**Comment Categories:**

- Tier 1: **Key Decision Points** – Discuss first
- Tier 2: **High Substance Edits** – Discuss second
- Tier 3: **Moderate Substance Edits** – Discuss third
- Tier 4: **Noncontroversial or Low Substance Edits** – Will expose and only discuss upon comment

**VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities**

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**Commented [CD1]:** Please clarify which version (i.e., effective date) of the VM was used for the comparison. Before any changes for VM-22 are adopted, a final comparison against the latest version of the VM will need to be performed.

**Commented [VM222R1]:** Final comparison to be made prior to adoption

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Commented [X3]: Note that part of the 2022 VM updates was to replace all instances of "stochastic reserve" with "SR" other than the initial definition in VM-01.

Commented [VM224R3]: Edit to be reflected in next exposure



Section 1: Background

A. Purpose

Sections 1 through 13 of these requirements establish the minimum reserve valuation standard for non-variable annuity contracts as defined in Section 2.A and issued on or after 1/1/2024. Section 14 of these requirements establish the maximum valuation rate for payout annuities for contracts issued on or after 1/1/2018. For all contracts encompassed by the Scope, these requirements constitute the Commissioners Annuity Reserve Valuation Method (CARVM) and, for certain contracts and certificates, the Commissioners Reserve Valuation Method (CRVM).

**Guidance Note:** CRVM requirements apply to some group pension contracts.

**Drafting Note:** There is a guidance note in VM-21 explains that the reserve projection requirements are generally consistent with RBC C-3 Phase II requirements. However, it was decided to exclude this guidance note from VM-22 for the time being, though this may be revisited depending on whether further updates are made to the C-3 Phase I capital framework.

**Guidance Note:**

Relationship to RBC Requirements

These requirements anticipate that the projections described herein are used for the determination of RBC for all of the contracts falling within the scope of these requirements. These requirements and the RBC requirements for the topics covered within Sections 4.A through 4.E are identical. However, while the projections described in these requirements are performed on a basis that ignores federal income tax, a company may elect to conduct the projections for calculating the RBC requirements by including projected federal income tax in the cash flows and reducing the discount interest rates used to reflect the effect of federal income tax as described in the RBC requirements. A company that has elected to calculate RBC requirements in this manner may not switch back to using a calculation that ignores the effect of federal income tax without approval from the domiciliary commissioner.

B. Principles

The projection methodology used to calculate the stochastic reserve SR is based on the following set of principles. These principles should be followed when interpreting and applying the methodology in these requirements and analyzing the resulting reserves.

**Guidance Note:** The principles should be considered in their entirety, and it is required that companies meet these principles with respect to those contracts that fall within the scope of these requirements and are in force as of the valuation date to which these requirements are applied.

**Principle 1:** The objective of the approach used to determine the stochastic reserve SR is to quantify the amount of statutory reserves needed by the company to be able to meet contractual

**Commented [X5]:** The proposal suggests VM-22 is not operative until 1/1/2024, which contradicts Section 13 and existing requirements. We would suggest rewording this to clarify that Section 13 is effective after 12/31/2017. Further, we would suggest consistency in labeling of dates (either all text or all numeric).

**Commented [VM226R5]:** Edits to address this comment will be reflected in next exposure

**Commented [CD7]:** might be clearer to refer to "Section 2.A" here

**Commented [VM228R7]:** No objections from the Subgroup to an approach that is broader and focuses on Section 2.A. ACLI will follow-up with proposed revisions to the scope section

**Commented [X9]:** The statement only addresses "contracts". Recommend adding "and certificates". Need to do a holistic review if where "and certificates" may be needed.

**Commented [VM2210R9]:** Edits to address this comment will be reflected in next exposure

**Commented [X11]:** (Relationship to RBC Requirements): The VM-21 guidance note was not included in VM-22; however, we believe it would be appropriate to retain and reword to say, "products that calculate a stochastic reserve", since the relationship to RBC would likely be maintained.

**Commented [VM2212R11]:** Subgroup agreed to remove guidance note for now and replace with a drafting note that states the RBC reference will be revisited based on whether updates are made to the C-3 Phase I framework.

**Commented [X13]:** We would support consistent application of principles across all chapters as currently VM-20 does not have a like set of principles. We believe this could involve a broader discussion of the assorted product requirements in the VM. As a shorter-term fix, we would recommend generalizing the principles where appropriate and moving these to "Section 1, Introduction" or "VM-01" and equally applying to VM-20

**Commented [VM2214R13]:** Discussed with Subgroup. Members are open and interested to a common principles chapter, but decided to hold off on developing for now.

obligations in light of the risks to which the company is exposed with an element of conservatism consistent with statutory reporting objectives.

**Principle 2:** The calculation of the ~~stochastic reserve~~SR is based on the results derived from an analysis of asset and liability cash flows produced by the application of a stochastic cash-flow model to equity return and interest rate scenarios. For each scenario, the greatest present value of accumulated deficiency is calculated. The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions and prescribed guardrails) to allow the natural offset of risks within a given scenario. The methodology uses a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model and sets the ~~stochastic reserve~~SR at a degree of confidence using the CTE measure applied to the set of scenario specific greatest present values of accumulated deficiencies that is deemed to be reasonably conservative over the span of economic cycles.

**Guidance Note:** Examples where full aggregation between contracts may not be possible include experience rated group contracts and the operation of reinsurance treaties.

**Principle 3:** The implementation of a model involves decisions about the experience assumptions and the modeling techniques to be used in measuring the risks to which the company is exposed. Generally, assumptions are to be based on the conservative end of the confidence interval. The choice of a conservative estimate for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the ~~stochastic reserve~~SR at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the ~~stochastic reserve~~SR, the company should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

**Guidance Note:** The intent of Principle 3 is to describe the conceptual framework for setting assumptions. Section 10 provides the requirements and guidance for setting contract holder behavior assumptions and includes alternatives to this framework if the company is unable to fully apply this principle. More guidance and requirements for setting assumptions in general are provided in Section 12.

**Principle 4:** While a stochastic cash-flow model attempts to include all real-world risks relevant to the objective of the stochastic cash-flow model and relationships among the risks, it will still contain limitations because it is only a model. The calculation of the ~~stochastic reserve~~SR is based on the results derived from the application of the stochastic cash-flow model to scenarios, while the actual statutory reserve needs of the company arise from the risks to which the company is (or will be) exposed in reality. Any disconnect between the model and reality should be reflected in setting prudent estimate assumptions to the extent not addressed by other means.

**Principle 5:** Neither a cash-flow scenario model ~~nor a method based on factors calibrated to the results of a cash flow scenario model~~ can completely quantify a company's exposure to risk. A model attempts to represent reality but will always remain an approximation thereto

**Commented [CD15]:** for consistency, will this edit be considered for VM-21 as well?

**Commented [VM2216R15]:** VM-22 Subgroup will initially focus on VM-22. Consistency with other VM chapters can be explored after development of initial Subgroup recommendation for VM-22.

**Commented [X17]:** We support this principle but note that later sections appear to contradict this principle. For example, the statement "The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions) to allow the natural offset of risks within a given scenario." contradicts with the introduction of additional reserve categories and other limitations (such as model segment restrictions).

**Commented [VM2218R17]:** No objections from subgroup members to include "and prescribed guardrails" in principal 2 to address the concern in this comment.

**Commented [X19]:** Principle 2: Recommend reinstating Guidance Note in Principle 2 to be consistent with VM-21.

**Commented [VM2220R19]:** No objections from Subgroup members to reinstating this guidance note.

**Commented [X21]:** We suggest deleting the sentence "Generally, assumptions are..." since it does not provide guidance. We also suggest tightening the remainder of the text for clarity.

**Commented [VM2222R21]:** Subgroup in favor of retaining language

**Commented [X23]:** ~~and general assumption guidance~~

**Commented [VM2224R23]:** Subgroup agreed with this comment. Edits to address this comment will be reflected in next exposure.

**Commented [X25]:** Principle 5 has the statement "nor a method based on factors calibrated to the results of a cash flow scenario model" which is intended for the Alternative Methodology in VM-21. The statement should be deleted from VM-22.

**Commented [VM2226R25]:** Edits to address this comment will be reflected in next exposure

and, hence, uncertainty in future experience is an important consideration when determining the ~~stochastic reserve SR~~. [Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve solely to reduce the calculated ~~stochastic reserve SR~~ without also reducing risk on scenarios similar to those used in the actual cash-flow modeling are inconsistent with these principles. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit “foreknowledge” of the components of the required methodology.

**Commented [X27]:** We recommend deleting the third sentence (starting with “Therefore, the use of assumptions...”) because this lacks historical context and is covered by the final sentence.

**Commented [VM2228R27]:** Subgroup in favor of retaining language

C. Risks Reflected and Risks Not Reflected

**Commented [X29]:** Consistent with our comments in B, we would support consistent application of risks reflected across all chapters, rather than embedding the language in each chapter. Were this to be retained in VM-22, we would suggest maintaining consistency with VM-21 to avoid any confusion.

**Commented [VM2230R29]:** The Subgroup is open to a common chapter with all risks identified for different PBR frameworks, but decided to hold off on developing for now.

**Commented [CD31]:** VM-21 has “... and Risks Not Reflected” in this section header, which should be retained here since the section on risks not reflected is still in here.

**Commented [VM2232R31]:** Subgroup in favor of changing section header, as subsection 3 will be removed, but “risks not reflected” is still applicable to subsection 4

1. The risks reflected in the calculation of reserves under these requirements arise from actual or potential events or activities that are both:
  - a. Directly related to the contracts falling under the scope of these requirements or their supporting assets; and
  - b. Capable of materially affecting the reserve.
2. Categories and examples of risks reflected in the reserve calculations include, but are not necessarily limited to:
  - a. Asset risks
    - i. Credit risks (e.g., default or rating downgrades).
    - ii. Commercial mortgage loan roll-over rates (roll-over of bullet loans).
    - iii. Uncertainty in the timing or duration of asset cash flows (e.g., shortening (prepayment risk) and lengthening (extension risk)).
    - iv. Performance of equities, real estate, and Schedule BA assets.
    - v. Call risk on callable assets.
    - vi. Separate account fund performance.

**Drafting Note:** Feedback welcome on whether to remove reference to separate accounts in VM-22. Whether references to separate accounts are retained or removed, consider making the treatment of such references consistent throughout VM-22.

**Commented [CD33]:** Can a non-variable annuity have a separate account fund? I am not aware of any such annuity, that is not a variable annuity. Furthermore, all references to separate accounts and fund performance were deleted from this draft. Thus, we should consider deleting this item from the list.

**Commented [VM2234R33]:** Decided to retain for now, but add a drafting note to solicit feedback and mention the draft should be consistent throughout (as CA pointed out that the comment was regarding being internally consistent within the VM-22 draft).

- i. Reinsurer default, impairment, or rating downgrade known to have occurred before or on the valuation date.
  - ii. Mortality/longevity, persistency/lapse, partial withdrawal, and premium payment risks.
  - iii. Utilization risk associated with guaranteed living benefits.
  - iv. Anticipated mortality trends based on observed patterns of mortality improvement or deterioration, where permitted.
  - v. Annuitization risks.
  - vi. Additional premium dump-ins or deposits (high interest rate guarantees in low interest rate environments).
  - vii. Applicable expense risks, including fluctuation in maintenance expenses directly attributable to the business, future commission expenses, and expense inflation/growth.
- c. Combination risks
- i. Risks modeled in the company's risk assessment processes that are related to the contracts, as described above.
  - ii. Disintermediation risk (including such risk related to payment of surrender or partial withdrawal benefits).
  - iii. Risks associated with revenue-sharing income.
- ~~33. The risks not necessarily reflected in the calculation of reserves under these requirements are:~~
- a. ~~Those not associated with the policies or contracts being valued, or their supporting assets.~~
  - b. ~~Determined to not be capable of materially affecting the reserve.~~
34. Categories and examples of risks not reflected in the reserve calculations include, but are not necessarily limited to:
- a. Asset risks
    - i. Liquidity risks associated with a sudden and significant levels of withdrawals and surrenders. "run on the bank."
  - b. Liability risks
    - i. Reinsurer default, impairment or rating downgrade occurring after the valuation date.
    - ii. Catastrophic events (e.g., epidemics or terrorist events).

- Commented [CD35]:** Is there a distinction between "dump-ins" and "deposits"? Why are both words needed? Also, if it's determined that both words are needed, should this same change be made in VM-21?
- Commented [VM2236R35]:** Edits to address this comment will be reflected in next exposure
- Commented [X37]:** Recommend change to "fluctuation in" maintenance expenses for clarity.
- Commented [VM2238R37]:** Edits to address this comment will be reflected in next exposure
- Commented [CD39]:** should this same change also be made to VM-21?
- Commented [VM2240R39]:** Potential VM-21 will be examined separately from this Subgroup at a later point
- Commented [X41]:** We recommend removing the bullet "Risks modeled in the company's risk assessment processes that are related to the contracts, as described above" as this is unclear and probably extraneous.
- Commented [VM2242R41]:** Subgroup in favor of retaining language.
- Commented [X43]:** We recommend removing this section. With the specific RBC language removed, the section loses meaning: "a" is unnecessary and "b" is redundant with other sections of the VM which allow for materiality considerations (language in VM-20 is likely better for this purpose and should be used consistently).
- Commented [VM2244R43]:** Subgroup agrees with removing this section.
- Commented [CD45]:** Suggest eliminated "policies or," since customarily, annuities are "contracts"
- Commented [VM2246R45]:** Edits to address this comment will be reflected in next exposure
- Commented [CD47]:** This is not in VM-21, and my suggestion would be to delete this
- Commented [VM2248R47]:** Subgroup agrees with removing
- Commented [X49]:** Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly ... [1]
- Commented [VM2250R49]:** Subgroup agrees with removing this section.
- Commented [CD51]:** should this same change also be made to VM-21?
- Commented [VM2252R51]:** Edits to address this comment will be reflected in next exposure
- Commented [X53]:** The revised language "sudden and significant levels of withdrawal and surrenders" replaced ... [2]
- Commented [VM2254R53]:** Subgroup in favor of retaining VM-21 language of "run on the bank".

- iii. Major breakthroughs in life extension technology that have not yet fundamentally altered recently observed mortality experience.
  - iv. Significant future reserve increases as an unfavorable scenario is realized.
- c. General business risks
- i. Deterioration of reputation.
  - ii. Future changes in anticipated experience (reparameterization in the case of stochastic processes), which would be triggered if and when adverse modeled outcomes were to actually occur.
  - iii. Poor management performance.
  - iv. The expense risks associated with fluctuating amounts of new business.
  - v. Risks associated with future economic viability of the company.
  - vi. Moral hazards.
  - vii. Fraud and theft.
  - viii. Operational.
  - ix. Litigation.

D. Specific Definitions for VM-22

**Buffer Annuity**  
 Interchangeable term for Registered Index-Linked Annuity (RIILA). See definition for Registered Index-Linked Annuity below.

- E.
- **Deferred Income Annuity (DIA)**  
 An annuity which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin one year 13 months or later after (or from) the issue date if the contract holder survives to a predetermined future age.
  - **Fixed Indexed Annuity (FIA)**  
 An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, subject to certain limits, typically with guaranteed principal.
  - **Flexible Premium Deferred Annuity (FPDA)**  
 An annuity with an account value established with a premium amount but allows for additional deposits to be paid into the annuity over time, resulting in an increase to the account value. The contract also has a guaranteed interest rate during the accumulation phase and has

**Commented [X55]:** We recommend deleting the wording "fundamentally" if a breakthrough is known to have fundamentally changed expected future mortality, but is not yet significantly reflected in historical experience, why is it not reflected? Do we know about this fundamental shift for years before it is reflected? This issue also applies to the VM-21 requirement.

**Commented [VM2256R55]:** Edits to address this comment will be reflected in next exposure

**Commented [X57]:** We recommend removing the bullet "Significant future reserve increases as an unfavorable ... [3]

**Commented [VM2258R57]:** Subgroup in favor retaining language to stay consistent with VM-21.

**Commented [X59]:** List could be expanded to included operational risk and litigation risk.

**Commented [VM2260R59]:** Edits to address this comment will be reflected in next exposure

**Commented [X61]:** It seems the definitions included in this section are largely only used for the purpose of ... [4]

**Commented [VM2262R61]:** No objections from the Subgroup to an approach that is broader and focuses ... [5]

**Commented [CD63]:** The format of this Definitions section is inconsistent with other parts of the VM. In ... [6]

**Commented [VM2264R63]:** Edits to address this comment will be reflected in next exposure

**Commented [X65]:** The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity ... [7]

**Commented [VM2266R65]:** Edits to address this comment will be reflected in next exposure

**Commented [X67]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guide ... [8]

**Commented [VM2268R67]:** Edits to address this comment will be reflected in next exposure

**Commented [X69]:** The wording "after (or from)" the issue date used in the DIA and SPIA definitions is conf ... [9]

**Commented [VM2270R69]:** Edits to address this comment will be reflected in next exposure

**Commented [X71]:** Is "typically" intended to be a requirement in the definition? That is, to qualify as F ... [10]

**Commented [VM2272R71]:** Edits to address this comment will be reflected in next exposure

**Commented [CD73]:** insert: "subject to certain limits,"

**Commented [VM2274R73]:** Edits to address this comment will be reflected in next exposure

**Commented [X75]:** The definition of FIA describes the account value as typically with guaranteed principal. ... [11]

**Commented [VM2276R75]:** Edits to address this comment will be reflected in next exposure

guaranteed mortality and interest rates applicable at the time of conversion to the payout phase.

- **Funding Agreement**

A contract issued to an institutional investor (domestic and international non-qualified fixed income investors) that provides fixed or floating interest rate guarantees.

- **Guaranteed Investment Contract (GIC)**

Insurance contract typically issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.

- **Index Credit Hedge Margin**

A margin capturing the risk of inefficiencies in the company's hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions.

- **Index Credit**

Any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to contract policy values that is linked to an index or indices. Amounts credited to the contract policy resulting from a floor on an index account are included.

- **Index Crediting Strategy**

The strategy defined in a contract to determine index credits for a contract. This refers to For example, this may refer to underlying index, index parameters, date, timing, performance triggers, and other elements of the crediting method.

- **Index Parameter**

Cap, floor, participation rate, spreads, or other features describing how the contract utilizes the index.

- **Longevity Reinsurance**

An agreement, typically a reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.

- Typically, the reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these

Commented [CD77]: should be "contract"

Commented [VM2278R77]: Edits to address this comment will be reflected in next exposure

Commented [CD79]: should be "contract"

Commented [VM2280R79]: Edits to address this comment will be reflected in next exposure

Commented [X81]: We would suggest adding performance trigger to the list, along with other potential crediting methods; alternatively, the definition could specify that the crediting methods listed are examples only

Commented [VM2282R81]: Edits to address this comment will be reflected in next exposure

Commented [X83]: The definition states that "Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61 are not included in this definition". Why is this the case and does this imply that longevity swaps are not within the scope of VM-22? Recommend adding to the out of scope list in "2.A. Scope" if that is the case. Clarification would also be helpful on what guidance should be used for these agreements if out of scope for VM-22. Further, we would suggest removing "typically" from the definition

Commented [VM2284R83]: Academy will follow-up with proposed revisions to the definition of Longevity Reinsurance.

Commented [VM2285]: New Jersey comment refers due to future premiums, longevity reinsurance may generate negative reserves, which can be used to eliminate or reduce other immediate annuity reserves. Suggest using net premium methodology, solving for a k-factor at issue to solve for  $PV(\text{premiums}) = PV(\text{benefits})$

Commented [VM2286R85]: VM-22 Subgroup has exposed a proposal from NJ to address this issue.

agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.

- Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular, contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.
- **Market Value Adjustment (MVA) Annuity**  
 An annuity with an account value where withdrawals and full surrenders are subject to adjustments based on interest rates or index returns at the time of withdrawal/surrender. There could be ceilings and floors on the amount of the market-value adjustment.
- **Modified Guaranteed Annuity (MGA)**  
 A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account and the value of which are guaranteed if held for specified periods of time. [The contract contains nonforfeiture values and death benefits that are based upon a market-value adjustment formula if held for shorter periods.]
- **Multiple Year Guaranteed Annuity (MYGA)**  
 A type of fixed non-variable annuity that provides a pre-determined and contractually guaranteed interest rate for specified periods of time, after which there is typically an annual reset or renewal of a multiple year guarantee period.
- **Pension Risk Transfer (PRT) Annuity**  
 An annuity, typically a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).
- **Registered Index-Linked Annuity (RILA)**  
 An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, similar to a Fixed Indexed Annuity, but with downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.
- **Single Premium Immediate Annuity (SPIA)**  
 An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months one year after (or from) the issuedate ~~issue date~~.

**Commented [X87]:** We recommend editing the definition as follows "A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account..."

**Commented [VM2288R87]:** Edits to address this comment will be reflected in next exposure

**Commented [X89]:** To clarify definition of MGA, recommend adding "death benefits"

**Commented [VM2290R89]:** Edits to address this comment will be reflected in next exposure

**Commented [CD91]:** should this be "Multi-Year" instead of "Multiple Year"? The former is the more commonly used term for MYGA

**Commented [VM2292R91]:** Edits to address this comment will be reflected in next exposure

**Commented [CD93]:** "fixed annuity" is not defined. Is it better to change all instances of "fixed annuity" to "non-variable annuity" to be consistent with the terminology introduced in Section 1.A (and to be aligned with the actual VM-22 chapter name)? An alternative could be to add a definition for "fixed annuity", with the definition of it being a "non-variable annuity"

**Commented [VM2294R93]:** Subgroup in favor of the term "non-variable annuity" instead of "fixed annuity". Changes are made consistently throughout the VM-22 draft.

**Commented [CD95]:** ok to keep this as "multiple year"

**Commented [VM2296R95]:** Edits to address this comment will be reflected in next exposure

**Commented [X97]:** Is "typically" intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance ... [12]

**Commented [VM2298R97]:** Academy will review this comment as part of revisiting the longevity reinsurance ... [13]

**Commented [X99]:** It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product ... [14]

**Commented [VM22100R99]:** ACL already following up on a proposal to address the scope and definitions, v ... [15]

**Commented [X101]:** If need to address Buffer Annuity (not sure this is needed), can add here as a subset of RILA

**Commented [VM22102R101]:** Edits to remove "Buffer Annuity" will be reflected in next exposure

**Commented [X103]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guid ... [16]

**Commented [VM22104R103]:** Edits to address this comment will be reflected in next exposure

**Commented [X105]:** The wording "after (or from)" the issue date used in the DIA and SPIA definitions is con ... [17]

**Commented [VM22106R105]:** Edits to address this comment will be reflected in next exposure

- **Single Premium Deferred Annuity (SPDA)**  
An annuity with an account value established with a single premium amount that grows with a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase. May also include cases where the premium is accepted for a limited amount of time early in the contract life, such as only in the first duration.
- **Stable Value Contract**  
A contract that provides limited investment guarantees, typically preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios typically consist of fixed income securities, which may sit in the insurer's general account, a separate account, or in a third-party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.
- **Structured Settlement Contract (SSC)**  
A contract that provides periodic benefits and is purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes. ~~Adverse mortality is typically expected for these contracts.~~
- **Synthetic Guaranteed Investment Contract (Synthetic GIC)**  
Contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the ~~contract policyholder~~ or plan trust.
- **Term Certain Payout Annuity**  
A contract issued, which offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.
- **Two-Tiered Annuity**  
A deferred annuity with two tiers of account values. One, with a higher accumulation interest rate, is only available for annuitization or death. The other typically contains a lower accumulation interest rate, and is only available upon surrender.

~~The term "cash surrender value" means, for the purposes of these requirements, the amount available to the contract holder upon surrender of the contract. Generally, it is equal to the account value less any applicable surrender charges, where the surrender charge reflects the availability of any free partial surrender options. However, for contracts where all or a portion of the amount available to the contract holder upon surrender is subject to a market value adjustment, the cash surrender value shall reflect the market value adjustment consistent with the required treatment of the underlying assets. That is, the cash surrender value shall reflect any market value adjustments where the underlying assets are reported at market value, but it shall not reflect any market value adjustments where the underlying assets are reported at book value.~~

Commented [X107]: Suggest striking sentence "Adverse mortality is typically expected for these contracts." from definition. Additionally, it is possible that there may be non-standard settlements.

Commented [VM22108R107]: Edits to address this comment will be reflected in next exposure

Commented [CD109]: suggest spelling out GIC first, followed by the acronym

Commented [VM22110R109]: Edits to address this comment will be reflected in next exposure

Commented [CD111]: should be "contract holder"

Commented [VM22112R111]: Edits to address this comment will be reflected in next exposure

Commented [CD113]: this definition still applies, should we keep it?

Commented [VM22114R113]: Comment retracted in light of "Cash Surrender Value" definition being included in VM-01



~~The term "guaranteed minimum death benefit" (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:~~

~~— increased by an amount that may be either specified by or computed from other policy or contract values; and~~

~~— has the potential to produce a contractual total amount payable on such death that exceeds the account value; or~~

~~— in the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.~~

E. Materiality

The company shall establish a standard containing the criteria for determining whether an assumption, risk factor, or other element of the principle-based valuation has a material impact on the size of the reserve. This standard shall be applied when identifying material risks.

Section 2: Scope and Effective Date

A. Scope

Subject to the requirements of this Sections 1 to 13 of VM-22 are annuity contracts, certificates and contract features, whether group or individual, including both life contingent and term-certain-only, directly written or assumed through reinsurance issued on or after 1/1/2024, with the exception of contracts or benefits listed below.

Products out of scope include:

1. ~~Contracts or benefits that are subject to VM 21 (such as variable annuities, RILAs, buffer annuities, and structured annuities)~~
2. ~~GICs~~
3. ~~Synthetic GICs~~
4. ~~Stable Value Contracts~~
5. ~~Funding Agreements~~

Products in scope of VM-22 include ~~non-variable~~ Fixed annuities which consist of, but are not limited to, the following ~~the~~ list:

- **Account Value Based Annuities**
  1. Deferred Annuities (SPDA & FPDA)
  2. Multi-Year Guarantee Annuities (MYGA)
  3. Fixed Indexed Annuities (FIA)
  4. Market Value Adjustments (MVA)
  5. Two-tiered Annuities
  6. Guarantees/Benefits/Riders on ~~Non-Variable~~ Fixed Annuity Contracts
- **Payout Annuities**

- Commented [CD115]: this definition still applies, should we keep it?
- Commented [VM22116R115]: Subgroup recommends moving this definition to VM-01, which is now included at the end of the draft document.
- Commented [X117]: Add consistent with VM-21 Section 1.E, which was added to the 2022 VM.
- Commented [VM22118R117]: Edits to address this comment will be reflected in next exposure
- Commented [X119]: Consistent with our comment in Section 1, the language around effective date should be clear this only applies to new PBR methodology, and rates in Section 13 have a different effective date.
- Commented [VM22120R119]: Edits to address t... [18]
- Commented [X121]: We would support reworking... [23]
- Commented [VM22122R121]: ACLI will follow up... [24]
- Commented [X123]: The reserving categories for... [22]
- Commented [VM22124R123]: See NY comment... [21]
- Commented [VM22125R123]: See Equitable.com... [20]
- Commented [VM22126R123]: The VM-22 Subgr... [19]
- Commented [CD127]: suggest numbering the par... [26]
- Commented [VM22128R127]: Edits to address t... [25]
- Commented [CD129]: suggest swapping the orde... [27]
- Commented [VM22130R129]: Edits to address t... [28]
- Commented [X131]: Since buffer annuities are a s... [29]
- Commented [VM22132R131]: Edits to address t... [30]
- Commented [CD133]: this is not defined in the D... [31]
- Commented [VM22134R133]: Edits to address t... [32]
- Commented [X135]: This needs to be revised to b... [33]
- Commented [VM22136R135]: Edits to address t... [34]
- Commented [CD137]: should this be "non-variabl... [35]
- Commented [VM22138R137]: Edits to address t... [36]
- Commented [X139]: Typo. Delete extra "the".
- Commented [VM22140R139]: Edits to address t... [38]
- Commented [CD141]: grammar - delete "the"
- Commented [VM22142R141]: Edits to address t... [37]
- Commented [CD143]: should have space instead of dash
- Commented [VM22144R143]: Edits to address t... [39]
- Commented [CD145]: delete the "s" and add "Annuities"
- Commented [VM22146R145]: Edits to address t... [40]
- Commented [CD147]: should this be "Non-Variab... [41]
- Commented [VM22148R147]: Edits to address t... [42]

1. Single Premium Immediate Annuities (SPIA)
2. Deferred Income Annuities (DIA)
3. Term Certain Payout Annuities
4. Pension Risk Transfer Annuities (PRT)
5. Structured Settlement Contracts (SSC)
6. Longevity Reinsurance

Products out of scope include:

1. Contracts or benefits that are subject to VM-21 (such as variable annuities and RILAs)
2. GICs
3. Synthetic GICs
4. Stable Value Contracts
5. Funding Agreements

~~The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22.~~

B. Effective Date & Transition

Effective Date

These requirements apply for valuation dates on or after January 1, ~~2024~~2025.

**Transition**

A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-22 PBR requirements and issued during the first three years following the effective date of VM-22 PBR. ~~If a company during the three-year transition period elects to apply VM-22 PBR to a block of such business, then a company must continue to apply the requirements of VM-22 PBR for future issues of this business. Irrespective of the transition date, a company shall apply VM-22 PBR requirements to applicable blocks of business on a prospective basis starting at least three years after the effective date.~~

**Commented [CD149]:** for consistency, make plural; i.e., change to "ies"

**Commented [VM22150R149]:** Edits to address this comment will be reflected in next exposure

**Commented [X151]:** We suggest moving or deleting the sentence "The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22." from this section as it does not seem fitting here.

**Commented [VM22152R151]:** Edits to address this comment will be reflected in next exposure

**Commented [CD153]:** self-referencing "VM-22" is not necessary

**Commented [VM22154R153]:** Edits to address this comment will be reflected in next exposure

**Commented [X155]:** Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here ... [43]

**Commented [VM22156R155]:** Edits to address this comment will be reflected in next exposure

**Commented [CD157]:** again, suggest numbering the paragraphs within this section

**Commented [VM22158R157]:** Edits to address this comment will be reflected in next exposure

**Commented [X159]:** We still have a question about whether RBC factors are still at an appropriate level, ... [44]

**Commented [VM22160R159]:** Comment related to RBC

**Commented [X161]:** Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section ... [45]

**Commented [VM22162R161]:** Subgroup discussed moving current VM-22 requirements (currently Secti ... [46]

**Commented [X163]:** To be more clear, recommend adding "transition period" to "the three years".

**Commented [VM22164R163]:** Edits to address this comment will be reflected in next exposure

**Commented [X165]:** Can a company wait until the end of the transition period to start PBR, but then apply PBR ... [47]

**Commented [VM22166R165]:** Discussed with Subgroup and decided to keep the VM-22 language silent on th ... [50]

**Commented [CD167]:** Will we (or should we) allow for any early adopters (like we did for VM-21)? It would ... [49]

**Commented [VM22168R167]:** Discussed with Subgroup and decided to not have early adoption before the st ... [48]

Section 3: Reserve Methodology

A. Aggregate Reserve

The aggregate reserve for contracts falling within the scope of these requirements shall equal the ~~stochastic reserve~~SR (following the requirements of Section 4) ~~plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option,~~ less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A and VM-C.

**Guidance Note:** Contracts valued under applicable requirements in VM-A and VM-C are ones that pass the exclusion test and elect to not model PBR ~~stochastic reserves~~SRs, per the requirements in Section 3.E.

B. Impact of Reinsurance ~~Ceded~~

All components in the aggregate reserve shall be determined post-reinsurance ceded, that is net of any reinsurance cash flows arising from treaties that meet the statutory requirements that allow the treaty to be accounted for as reinsurance. A pre-reinsurance ceded reserve also needs to be determined by ignoring all reinsurance cash flows (costs and benefits) in the reserve calculation.

~~C. To Be Determined~~The Additional Standard Projection Amount

D. The Stochastic Reserve

~~The stochastic reserve~~  
 The additional standard projection amount is determined by applying one of the two standard projection methods defined in Section 6. The same method must be used for all contracts within a group of contracts that are aggregated together to determine the reserve. The company shall elect which method they will use to determine the additional standard projection amount. The company may not change that election for a future valuation without the approval of the domiciliary commissioner.

D. The SR

1. The SR shall be determined based on asset and liability projections for the contracts falling within the scope of these requirements, excluding those contracts valued using the methodology pursuant to applicable requirements in VM-A and VM-C, over a broad range of stochastically generated projection scenarios described in Section 8 and using prudent estimate assumptions as required in Section 3.GF herein.
2. ~~The stochastic reserve~~SR amount for any group of contracts shall be determined as CTE70 of the scenario reserves following the requirements of Section 4.

E. The DR

~~, with the exception of~~The DR for groups of contracts for which a company elects the Deterministic Certification Option in Section 7.E, ~~which shall be determined as the scenario reserve~~DR following the requirements of Section 4.

Commented [X169]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22170R169]: To address SPA later in the VM-22 development process.

Commented [X171]: One of the most confused parts of the draft was referring to a DR as the SR for certain contracts. Need to handle and refer to separately.

Commented [VM22172R171]: Edits to address this comment will be reflected in next exposure

Commented [X173]: Guidance is needed on how a pre-reinsurance reserve is to be determined.

Commented [VM22174R173]: ACLI will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure

Commented [X175]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22176R175]: Edits to address this comment will be reflected in next exposure

Commented [CD177]: Should this be Section 3.G?

Commented [VM22178R177]: Edits to address this comment will be reflected in next exposure

Commented [X179]: Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

Commented [VM22180R179]: Will replace "scenario reserve" with "deterministic reserve".

3. The reserve may be determined in aggregate across various groups of contracts within each Reserving Category as a single model segment when determining the stochastic reserve if the business and risks are not managed separately or are part of the same integrated risk management program. Aggregation is permitted if a resulting group of contracts (or model segment) follows the listed principles:SR.

#### F. Aggregation of Contracts for the DR and SR

Groups of contracts within different Reserving Categories may not be aggregated together in determining the SR or DR. For the purposes of VM-22, Reserving Categories are classified as the following:

- a. The “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities:
  - i. Immediate annuity contracts;
  - ii. Deferred income annuity contracts;
  - iii. Structured settlements in payout or deferred status;
  - iv. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
  - v. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
  - vi. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;
  - vii. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
  - viii. Pension Risk Transfer Annuities; and
  - ix. Longevity Reinsurance.

**Drafting Note:** Additional feedback is welcome for whether to permit optionality for categorizing guaranteed living benefit contracts with depleted fund value as either in the payout or accumulation reserving category.

**Commented [VM22181]:** include in deferred annuity with depleted fund value in payout reserving category or accumulation reserving category.

**Commented [VM22182R181]:** The Subgroup has elected to leave these contracts in the payout annuity reserving category, but is adding to a drafting note to welcome feedback.

b. The “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category”.

~~Using prudent actuarial judgement, consider the following elements when aggregating groups of contracts: whether groups of contracts are part of the same portfolio (or different portfolios that interact), same integrated risk management system, administered/managed together~~

4. Do not aggregate groups of contracts for which the company elects to use the Deterministic Certification Option in Section 7.E with any groups of contracts that do not use such option.

54.- To the extent that these limits on the aggregation result results in more than one model segment, the stochastic reserve SR aggregate reserve shall equal the sum of the stochastic reserve SR amounts computed for each model segment and scenario reserve DR amounts computed for each model segment for which the company elects to use the Deterministic Certification Option in Section 7.E.

G. Stochastic Exclusion Test

1. To the extent that certain groups of contracts pass one of the defined the stochastic exclusion tests in Section 7.B, these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A and VM-C, with the statutory maximum valuation rate for immediate annuities specified in and Section 13.

a. **Guidance Note:** The intention of contracts that pass the stochastic exclusion test is to provide the option to value contracts under VM-A and VM-C. This may apply to pre-PBR CARVM requirements in accordance with Actuarial Guideline XXXIII (AG33) methodology with type A, B, C rates for SPIAs issued before 2018; AG33 methodology with pre-PBR VM-22 rates for SPIAs issued on/after 2018; Actuarial Guideline XXXV (AG35) pre-PBR methodology for Fixed Indexed Annuities; and AG33 methodology (with interest rate updates for modernization initiatives on new contracts) for non-SPIAs.

2. For dividend-paying contracts, a dividend liability shall be established following requirements in VM-A and VM-C, as described above, for the base contract.

2.3. The approach for grouping contracts company may not group together contract types with significantly different risk profiles when performing the exclusion tests should follow the same principles that underlie the aggregation approach for model segments discussed for Stochastic Reserves in Section D above test.

H. Allocation of the Aggregate Reserve to Contracts

The aggregate reserve shall be allocated to the contracts falling within the scope of these requirements using the method outlined in Section 4.13, with the exception of contract following Section 3.E which are to be calculated on a seriatim basis.

I. Prudent Estimate Assumptions

1. With respect to the Stochastic Reserve SR in Section 3.D, the company shall establish the prudent estimate assumption for each risk factor in compliance with the requirements

**Commented [X183]:** The term "Deterministic Certification Option" may be confusing, as there is no "deterministic" reserve, unlike VM-20. We recommend consideration of an alternative term. In addition, we recommend changing the phrasing to "with the exception of groups of contracts for which a company elects the [Deterministic Certification Option], following the requirements of Section 7.E."

**Commented [VM22184R183]:** Now that deterministic reserve exists, the ACLI is fine retaining "Deterministic Certification Option"

**Commented [X185]:** Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

**Commented [VM22186R185]:** Will replace "scenario reserve" with "deterministic reserve".

**Commented [CD187]:** suggest expanding header ... [51]

**Commented [VM22188R187]:** No objections from ... [52]

**Commented [X189]:** Seems to imply that only SPI ... [53]

**Commented [VM22190R189]:** Edits to address t ... [54]

**Commented [CD191]:** Suggest rewording to just s ... [55]

**Commented [VM22192R191]:** Edits to address t ... [56]

**Commented [X193]:** We believe this guidance not ... [57]

**Commented [VM22194R193]:** No objections to ... [58]

**Commented [X195]:** The statement in this sectio ... [59]

**Commented [VM22196R195]:** Subgroup agreed ... [60]

**Commented [X197]:** This section seems to indiv ... [61]

**Commented [VM22198R197]:** Subgroup voted t ... [62]

**Commented [CD199]:** for clarity, change this refe ... [63]

**Commented [VM22200R199]:** Edits to address t ... [64]

**Commented [CD201]:** again, suggest rewording t ... [65]

**Commented [VM22202R201]:** Edits to address t ... [66]

**Commented [X203]:** Based on VM-20 language.

**Commented [VM22204R203]:** Subgroup agreed ... [67]

**Commented [X205]:** Either in this item or in Secti ... [68]

**Commented [VM22206R205]:** Edits to address t ... [69]

**Commented [X207]:** This sub-section seems more ... [70]

**Commented [VM22208R207]:** The Subgroup dec ... [71]

**Commented [CD209]:** VM-21 Section 3.H on ... [72]

**Commented [VM22210R209]:** Subgroup decided ... [73]

**Commented [CD211]:** should this be "Section 3.D"?

**Commented [VM22212R211]:** Edits to address t ... [74]

in Section 12 of Model #820 and must periodically ~~at least every 3 years~~ review and update the assumptions as appropriate in accordance with these requirements.

**Drafting Note:** Consider replacing “periodically” with “at least every 3 years in the paragraph above upon adoption of a similar APF for VM-20/VM-21.

~~2.~~ The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. ~~If the results of statistical testing or other testing~~ the review indicate that previously anticipated experience for a given factor is inadequate, then the ~~qualified actuary~~ Company shall set a new, adequate, anticipated experience assumption for the factor.

~~2.3.~~ To determine the prudent estimate assumptions, the ~~stochastic reserve~~ SR shall also follow the requirements in Sections 4 and ~~general assumptions including~~ Section 9 for asset assumptions, Section 10 for ~~contract policy holder~~ behavior assumptions, and Section 11 for mortality assumptions, and Section 12 for general guidance and expense assumptions.

J. Approximations, Simplifications, and Modeling Efficiency Techniques

A company may use simplifications, approximations, and modeling efficiency techniques to calculate the SR and/or the additional standard projection amount required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations, and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

**Guidance Note:**

Examples of modeling efficiency techniques include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques or other similar simplifications.

There are multiple ways of providing the demonstration required by Section 3.H. The complexity of the demonstration depends upon the simplifications, approximations or modeling efficiency techniques used. Examples include, but are not limited to:

1. Rounding at a transactional level in a direction that is clearly and consistently conservative or is clearly and consistently unbiased with an obviously immaterial impact on the result (e.g., rounding to the nearest dollar) would satisfy 3.H without needing a demonstration. However, rounding to too few significant digits relative to the quantity being rounded, even in an unbiased way, may be material and in that event, the company may need to provide a demonstration that the rounding would not produce a material understatement of the reserve.

**Commented [X213]:** Recommend to periodically review at least every three years.

**Commented [VM22214R213]:** Subgroup decided to adopt this wording if a similar APF is adopted for VM-20/VM-21.

**Commented [CD215]:** Should this be “the company... shall”, rather than the “qualified actuary... shall”? Not sure why this particular task falls on the QA, when “the company” generally has responsibility for PBR and, in the subsection directly before this one, the company is assigned the task of establishing prudent estimate assumptions.

**Commented [VM22216R215]:** Edits to address this comment will be reflected in next exposure

**Commented [X217]:** Suggest replacing “If the results of statistical testing or other testing” with “If the results of the review” to simplify language and avoid possible confusion.

**Commented [VM22218R217]:** Edits to address this comment will be reflected in next exposure

**Commented [X219]:** Recommend replacing “the qualified actuary” with “the Company” consistent with general PBR requirements that the company set assumptions.

**Commented [VM22220R219]:** Edits to address this comment will be reflected in next exposure

**Commented [CD221]:** should this be “the company”? See prior comment.

**Commented [VM22222R221]:** Edits to address this comment will be reflected in next exposure

**Commented [CD223]:** should this be “contract holder”?

**Commented [VM22224R223]:** Edits to address this comment will be reflected in next exposure

**Commented [X225]:** Need a new section for the general assumptions, including specifics for the expense assumptions. APF currently exposed for VM-21. We should be consistent with any edits.

**Commented [VM22226R225]:** Edits to address this comment will be reflected in next exposure

2. A brute force demonstration involves calculating the minimum reserve both with and without the simplification, approximation or modeling efficiency technique, and making a direct comparison between the resulting reserve. Regardless of the specific simplification, approximation or modeling efficiency technique used, brute force demonstrations always satisfy the requirements of Section 3.H.

3. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters and providing a detailed demonstration of why it did not understate the reserve by a material amount and the expected value of the reserve would not be less than the expected value of the reserve that would otherwise be calculated. This demonstration may be a theoretical, statistical or mathematical argument establishing, to the satisfaction of the insurance commissioner, general bounds on the potential deviation in the reserve estimate rather than a brute force demonstration.

~~Justify the use of randomly sampling withdrawal ages for each contract instead of following the exact prescribed WDCM method by demonstrating that the random sampling method is materially equivalent to the exact prescribed approach, and the simplification does not materially reduce the Additional Standard Projection Amount and the final reported reserve. In particular, the company should demonstrate that the statistical variability of the results based on the random sampling approach is immaterial by testing different random sets, e.g., if randomly selecting a withdrawal age for each contract, the probability distribution of the withdrawal age should be stable and not vary significantly when using different random number sets.~~

**Drafting Note:** Add back in the WDCM method example in the above guidance note if VM-22 uses this method for the SPA calculation.

**Commented [X227]:** Specific example should be tailored based on the SPA developed.

**Commented [VM22228R227]:** Delete for now and add back in if the WDCM method is used for the VM-22 SPA calculation.

**Commented [X229]:** Added consistent with VM-21 Section 3.H, which was added to the 2022 VM.

**Commented [VM22230R229]:** Edits to address this comment will be reflected in next exposure

Section 4: Determination of ~~Stochastic Reserve~~ SR

A. Projection of Accumulated Deficiencies

1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9.D. The company shall project cash flows including the following:

a. ~~Revenues~~ Gross premium received by the company including gross premiums received from the ~~policyholder~~ policyholder contract holder (including any due premiums as of the projected start date).

**Guidance Note:** If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.

b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses).

All material benefits projected to be paid to ~~contract~~ policyholders including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

**Guidance Note:** Amounts charged to account values on general account business are not revenue; examples include rider charges and expense charges.

a-c. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.

b-d. Insurance company expenses (including overhead and investment maintenance expense), commissions, contractual fees and charges, and revenue sharing income received by the company (net of applicable expenses) other acquisition expenses associated with business in force as of the valuation date.

e-e. Net Cash flows associated with any reinsurance.

d-f. Cash flows from hedging instruments as described in Section 4.A.4.

**Commented [NJ231]:** Consider including stochastic mortality in the SR for longevity reinsurance

**Commented [VM22232R231]:** Ported over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk for reinsurance liability assumptions. New language is included in Section 5.A.2.e, including a guidance note that explicitly mentions longevity reinsurance.

**Commented [CD233]:** Should this refer to Section 4 and Section 9?

**Commented [VM22234R233]:** Edits to address this comment will be reflected in next exposure

**Commented [CD235]:** "contract holder"?

**Commented [VM22236R235]:** Edits to address this comment will be reflected in next exposure

**Commented [X237]:** If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below. ... [75]

**Commented [VM22238R237]:** Edits to address this comment will be reflected in next exposure

**Commented [CD239]:** "contract holders"

**Commented [VM22240R239]:** Edits to address this comment will be reflected in next exposure

**Commented [X241]:** The purpose of this guidance note is not clear as these charges would be reflected in the ... [76]

**Commented [VM22242R241]:** Edits to address this comment will be reflected in next exposure

**Commented [CD243]:** should this be Section 10.I?

**Commented [VM22244R243]:** Edits to address this comment will be reflected in next exposure

**Commented [X245]:** Changed investment expense to be maintenance expense so that it does not repeat what ... [77]

**Commented [VM22246R245]:** Edits to address this comment will be reflected in next exposure

**Commented [X247]:** Added acquisition expenses.

**Commented [VM22248R247]:** Edits to address this comment will be reflected in next exposure

**Commented [X249]:** Take out the revenues that covers the investment expenses and added a separate bullet ... [78]

**Commented [VM22250R249]:** Edits to address this comment will be reflected in next exposure

**Commented [CD251]:** Both net and gross cash flows have to be considered, so I don't agree with the addi ... [79]

**Commented [VM22252R251]:** Edits to address this comment will be reflected in next exposure



e.g. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.

f.h. If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.

**Guidance Note:** Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.1.b are before consideration of policy loans), less additional policy loan principal (but excluding policy loan interest that is added to the policy loan principal balance).

Guidance Note: Section 4.A.1 requires market value adjustments (MVAs) on liability cash flows to be reflected because in a cash flow model, assets are assumed to be liquidated at market value to cover the cash outflow of the cash surrender; therefore, inclusion of the market value adjustment aligns the asset and liability cash flows. This may differ from the treatment of MVAs in the definition of cash surrender value (Section 1.D), which defines the statutory reserve floor for which the values must be aligned with the annual statement value of the assets.

## 2. Grouping of Index Crediting Strategies

Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy. In assigning each index crediting strategy to a grouping for projection purposes, the fundamental characteristics of the index crediting strategy shall be reflected, and the parameters shall have the appropriate relationship to the stochastically generated projection scenarios described in Section 8. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

Index accounts sharing similar index crediting strategies may also be grouped for modeling to an appropriately crafted proxy strategy normally expressed as a linear combination of recognized market indices, sub-indices or funds, in order to develop the investment return paths and associated interest crediting. Each index crediting strategy's specific risk characteristics, associated index parameters, and relationship to the stochastically generated scenarios in Section 8 should be considered before grouping or assigning to a proxy strategy. Grouping and/or development of a proxy strategy may not be done in a manner that intentionally understates the resulting reserve.

## 3. Model Cells

Projections may be performed for each contract in force on the date of valuation or by assigning contracts into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Assigning contracts to model cells may not be done in a manner that intentionally understates the resulting reserve.

**Commented [X253]:** Guidance Note regarding the market value adjustment seems still applies and should not be deleted. We reinstated the guidance note.

**Commented [VM22254R253]:** Subgroup ultimately decided to remove the guidance note, since it applies more to VM-21 products, is implied when assets are held at market value, and the reference to Section 4.A.1 is no longer applicable.

**Commented [X255]:** Suggest editing the first sentence to note scope is FIAs and to avoid confusion regarding the term "investment guideline" as follows: "Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy."

**Commented [VM22256R255]:** Edits to address this comment will be reflected in next exposure

4. Modeling of Hedges

- a. For a company that does not have a ~~future hedging program strategy tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR~~ requirements:
- i. The company shall not consider the cash flows from any future hedge purchases or any rebalancing of existing hedge assets in its modeling, since they are not included in the company's investment strategy supporting the contracts.
  - ii. Existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the starting assets. ~~The hedge assets may then be considered in one of two ways:~~
    - a) ~~Include the asset cash flows from any contractual payments and maturity values in the projection model; or~~
    - b) ~~No hedge positions in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.~~

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

~~A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.~~

- b. For a company that has ~~one or more a~~ future hedging strategies ~~program~~ tied directly ~~to supporting the contracts falling under the scope of VM-22 stochastic reserve SR~~ requirements:
- i. For a hedging program with hedge payoffs that offset interest credits associated with indexed interest strategies (indexed interest credits):
    - a) In modeling cash flows, the company shall include the cash flows from future hedge purchases or any rebalancing of existing hedge assets that are intended solely to offset interest credits to ~~policyholders~~ contract holders.
    - b) Existing hedging instruments that are currently held by the company for ~~this purpose offsetting the indexed credits~~ in support of the contracts falling under the scope of these requirements shall be included in the starting assets. Existing hedging instruments that are currently held by the company ~~not for any other purpose~~ offsetting the indexed credits should be modeled consistently with the requirements of Section 4.A.4.a.ii.

**Commented [X257]:** Given that Section 9 covers hedging, we would suggest considering moving parts of Section 4.A.4 to that section.

**Commented [VM22258R257]:** The Subgroup is open to edits on restructuring VM-22 to move more detailed hedging requirements to Section 9. Will look for any comments during the exposure.

**Commented [X259]:** VM-22 took out the CDHS requirement and replaced it with "future hedging program". Future hedging should not materially reduce reserves or TAR if it is not well documented. The hedging DG is currently working on this for VM-20/VM-21. We will work with VM-22 subgroup to edit VM-22 accordingly.

**Commented [VM22260R259]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X261]:** Suggest rewording "Future hedging program" to "hedging program with future transactions" to avoid ambiguity.

**Commented [VM22262R261]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD263]:** The word "future" to describe the "hedging program" here is confusing. What about current hedging programs with expected future hedge purchases? Why not just say "hedging program"? Also, I wanted to note that removing the concept of CDHS creates inconsistency with both VM-20 and VM-21. Why not retain it?

**Commented [VM22264R263]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD265]:** same comment as above, about the word "future" being confusing

**Commented [VM22266R265]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD267]:** "contract holders"

**Commented [VM22268R267]:** Edits to address this comment will be reflected in next exposure

**Commented [X269]:** "Any other purpose" in the last sentence seems overly broad and should be narrowed.

**Commented [VM22270R269]:** Edits to address this comment will be reflected in next exposure

**Commented [X271]:** Specify "for this purpose" as "for offsetting the indexed credits", specify "for any other purposes" as "not for offsetting the indexed credits".

**Commented [VM22272R271]:** Edits to address this comment will be reflected in next exposure

c) An Index Credit Hedge Margin for these hedge instruments shall be reflected by reducing index interest credit hedge payoffs by a margin multiple that shall be justified by sufficient and credible company experience and be no less than [X%] multiplicatively of the interest credited. This margin is intended to cover sources of potential error due the hedging itself and the ability for the company to accurately model it. In the absence of sufficient and credible company experience, a margin of [Y%] shall be assumed. There is no cap on the index credit hedge margin if company experience indicates actual error is greater than [Y%]. It is permissible to substitute stress-testing for sufficient and credible experience if such stress-testing comprehensively considers a robust range of future market conditions.

ii. For a company with any future hedging strategies that hedges any contractual obligation or risks other than indexed interest credits, the detailed requirements for the modeling of hedges are defined in Section 9. The following requirements do not supersede the detailed requirements.

a) The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the projections used in the determination of the stochastic reserve SR.

b) The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future. Because models do not always accurately portray the results of hedge programs, the company shall, through back-testing and other means, assess the accuracy of the hedge modeling. The company shall determine a stochastic reserve SR as the weighted average of two CTE values; first, a CTE70 (“best efforts”) representing the company’s projection of all of the hedge cash flows, including future hedge purchases, and a second CTE70 (“adjusted”) which shall use only hedge assets held by the company on the valuation date and only future hedge purchases associated with indexed interest credited. These are discussed in greater detail in Section 9. The SR shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E)I determined following the guidance of Section 9.C.4.

c) Consistent with Section 4.A.4.b.i., if the company has an indexed credit hedging program, the index credit hedge margin for instruments associated with indexed interest credited shall be reflected by reducing hedge payoffs by a margin multiple as defined in Section 4.A.4.b.i.c., in both the “best efforts” run and the “adjusted” run.

**Commented [X273]:** We believe the company should determine the appropriate margin based on the demonstration of effectiveness. Any guardrails on these undetermined values should be minimal, including as low as 0, subject to the appropriate demonstration of effectiveness. Further, we believe that documentation of effective product management should be contemplated in addition to historical effectiveness.

**Commented [VM22274R273]:** Subgroup agreed to revisit this discussion after field testing.

**Commented [CD275]:** clarify verbiage by saying "hedge instruments" or "derivative instruments"

**Commented [VM22276R275]:** Edits to address this comment will be reflected in next exposure

**Commented [X277]:** It is not clear how the stress testing can be used to support the index credit hedge margin. It is a test of the modeled strategy not actual performance and does not reflect any model error. We suggest that both back testing and stress testing be required and elaborated further:  
 Clearly specify method and metrics used for the back testing with focus on all available recent relevant history, not limited to 12 months  
 Recommend defined stress periods for stress testing, e.g., 2008 financial crisis, 2020 COVID impaired market conditions.

**Commented [X278R277]:** We will repeat the comment from our first letter: "Regarding hedge breakage expense assumptions, are both sources of error reflected here - error in the hedging itself, and error in the ability to accurately model it? Should we be separately considering the two limitations to make sure they are both clear: 1) the real-world hedging error and 2) the modeling error in reflecting the future hedging? Current error factor discussions seem muddled."

**Commented [VM22279R277]:** The Subgroup decided to A) Remove the reference to stress testing and B) Add wording to clarify the hedging margin covers both real-world hedging error and modeling error.

**Commented [X280]:** Again, need to coordinate with Hedging DG.

**Commented [VM22281R280]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X282]:** Margins are discussed in a different section, so recommend deleting.

**Commented [VM22283R282]:** Subgroup is open to receiving edits on the upcoming exposure to move the indexed credit hedging program margin requirements to a different section.

**Commented [X284]:** Edits were made to provide context and clarification for the requirements.

**Commented [VM22285R284]:** Edits to address this comment will be reflected in next exposure

- d) The use of products not falling under the scope of these VM-22 PBR Section 1 through 13 requirements (e.g., variable annuities) (e.g., equity indexed annuities) as a hedge shall not be recognized in the determination of accumulated deficiencies.

**Guidance Note:** Section 4.A.4.b.i is intended to address common situations for products with index crediting strategies where the company only hedges index credits or clearly separates index credit hedging from other hedging. In this case the hedge positions are considered similarly to other fixed income assets supporting the contracts, and a margin is reflected rather than modeling using a CTE70 adjusted run with no future hedge purchases. If a company has a more comprehensive hedge strategy combining index credits, guaranteed benefit, and other risks (e.g., full fair value or economic hedging), an appropriate and documented bifurcation method should be used in the application of sections 4.A.4.b.i and 4.A.4.b.ii above for the hedge modeling and justification. Such bifurcation methods may quantify the specific risk exposure attributable to index credit liabilities versus other liabilities such as guaranteed living benefits, and apply such for the basis for allocation.

**Guidance Note:** The requirements of Section 4.A.4 govern the determination of reserves for annuity contracts and do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

5. Revenue Sharing

If applicable, projections of accumulated deficiencies may include income from projected future revenue sharing, net of applicable projected expenses (net revenue-sharing income) if each of the following requirements set forth in VM-21 Sections 4.A.5.a through 4.A.5.f are met.

6. Length of Projections

Projections of accumulated deficiencies shall be run for as many future years as needed so that no materially greater reserve value would result from longer projection periods. Obligations remain at the end of the projection periods. Company can choose to run a shorter projection period but not shorter than 20 years and include the present value of the terminal benefits and expenses in the accumulated deficiency calculation.

7. Interest Maintenance Reserve (IMR)

The IMR shall be handled consistently with the treatment in the company's cash flow testing, and the amounts should be adjusted to a pre-tax basis.

B. Determination of Scenario Reserve

- 1. For a given scenario, the scenario reserve shall be determined using one of two methods described below:

- a) The starting asset amount plus the greatest present value, as of the projection start date, of the projected accumulated deficiencies; or

**Commented [X286]:** Clarify that "these requirements" should be specified as "VM-22 PBR requirements". Again, we suggest reconsidering the use of "VM-23", though.

**Commented [VM22287R286]:** Edits to address this comment will be reflected in next exposure

**Commented [CD288]:** it might be helpful to keep the parenthetical statement, with "variable annuities" as the example

**Commented [VM22289R288]:** Edits to address this comment will be reflected in next exposure

**Commented [X290]:** Unclear why Revenue Sharing is considered for non-variable products, can probably delete.

**Commented [VM22291R290]:** Decided to keep the reference to revenue sharing for now, just in case.

**Commented [X292]:** Clarify that for revenue sharing, the entire subsection of VM-21 Section 4.A.5 applies.

**Commented [VM22293R292]:** Edits to address this comment will be reflected in next exposure

**Commented [CD294]:** The "requirements are met" list is only in Section 4.A.5.a. Was the intent also to define the amount of net revenue-sharing income allowed in the projections? If so, will need to add verbiage to reference VM-21 Section 4.A.5.a through 4.A.5.f.

**Commented [VM22295R294]:** Edits to address this comment will be reflected in next exposure

**Commented [X296]:** We recommend that the projection period requirement be in line with that of VM-20. Instead of meeting the immateriality requirement, calculate the present value of the terminal benefits and expenses and include it in the accumulated deficiency calculation.

**Commented [VM22297R296]:** The Subgroup agreed with keeping the edit in the first sentence to be consistent with VM-20. However, the Subgroup decided to remove the second sentence, now that there is an estimations, simplifications, and approximations section in the latest VM-22 draft.

**Commented [VM22298]:** See Bill Wilton's comment letter, expressing opposition to inclusion of pre-tax IMR.

**Commented [VM22299R298]:** Will refer to LATF

**Commented [CD300]:** should we consider these changes to VM-21 as well, for consistency?

**Commented [VM22301R300]:** Edits to address this comment will be reflected in next exposure

**Commented [X302]:** Section does not specify what the reserve floor shall be (if any) for contracts without cash surrender value.

**Commented [VM22303R302]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may ... [80]

**Guidance Note:** The greatest present value of accumulated deficiencies can be negative.

- b) The direct iteration method, where the scenario reserve is determined by solving for the amount of starting assets which, when projected along with all contract cash flows, result in the defeasement of all projected future benefits and expenses at the end of the projection horizon with no positive accumulated deficiencies at the end of any projection year during the projection period.

The scenario reserve for any given scenario shall not be less than the cash surrender value with market value adjustment in aggregate on the valuation date for the group of contracts modeled in the projection.

2. Discount Rates

In determining the scenario reserve, unless using the direct iteration method pursuant to Section 4.B.1.b, the accumulated deficiencies shall be discounted at the NAER on additional assets, as defined in Section 4.B.3.

3. Determination of NAER on Additional Invested Asset Portfolio

- a. The additional invested asset portfolio for a scenario is a portfolio of general account assets as of the valuation date, outside of the starting asset portfolio, that is required in that projection scenario so that the projection would not have a positive accumulated deficiency at the end of any projection year. This portfolio may include only (i) General Account assets available to the company on the valuation date that do not constitute part of the starting asset portfolio; and (ii) cash assets.

**Guidance Note:**

Additional invested assets should be selected in a manner such that if the starting asset portfolio were revised to include the additional invested assets, the projection would not be expected to experience any positive accumulated deficiencies at the end of any projection year.

It is assumed that the accumulated deficiencies for this scenario projection are known.

- b. To determine the NAER on additional invested assets for a given scenario:
  - i. Project the additional invested asset portfolio as of the valuation date to the end of the projection period,
    - a) Investing any cash in the portfolio and reinvesting all investment proceeds using the company's investment policy.
    - b) Excluding any liability cash flows.

**Commented [X304]:** For products that do not have a cash surrender value, it is recommended that VM-22 use a "working reserve" concept, similar to VM-21 Section 3.1.1.1. Otherwise, there will be an issue aggregated with and without CSV.

**Commented [VM22305R304]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Commented [X306]:** For products with market value adjustment, needs to be floored at cash surrender value with MVA.

**Commented [X307]:** We believe that assets held in the separate account with performance not impacting policyholder benefits should be modeled consistent with how the business is managed.

- c) Incorporating the appropriate returns, defaults and investment expenses for the given scenario.
- ii. If the value of the projected additional invested asset portfolio does not equal or exceed the accumulated deficiencies at the end of each projection year for the scenario, increase the size of the initial additional invested asset portfolio as of the valuation date, and repeat the preceding step.
- iii. Determine a vector of annual earned rates that replicates the growth in the additional invested asset portfolio from the valuation date to the end of the projection period for the scenario. This vector will be the NAER for the given scenario.
- iv. ~~If the depletion of assets within the projection results contain any unreasonably extremely high negative or positive NAER upon borrowing due to the depletion of assets in the denominator, the NAER shall may be reset to a more appropriate discount rate, which may be carried out by imposing upper/lower limits or by using another approach, subject to actuarial judgement, that is appropriately prudent for statutory valuation the assumed cost of borrowing associated with each projected time period, in accordance with Section 4.D.3.e, as a safe harbor.~~

**Guidance Note:** There are multiple ways to select the additional invested asset portfolio at the valuation date. Similarly, there are multiple ways to determine the earned rate vector. The company shall be consistent in its choice of methods, from one valuation to the next.

**Commented [X308]:** The wording “unreasonably high” is not clear or appropriate. Recommend this requirement be revised as part of a holistic fix to address extreme outliers in NAER both on the low and high side to handle anomalies for all of VM-20, VM-21, and VM-22. Some upper/lower cutoffs could be used that depend on scenario returns.

**Commented [CD309]:** “unreasonably high” is not well defined. Also, do we need to consider guardrails in the case of “unreasonably high” positive NAERs, not just negative NAERs?

C. Projection Scenarios

1. Number of Scenarios

The number of scenarios for which the scenario reserve shall be computed shall be the responsibility of the company, and it shall be considered to be sufficient if any resulting understatement in the ~~stochastic reserve~~ SR, as compared with that resulting from running additional scenarios, is not material.

2. Economic Scenario Generation

Treasury Department interest rate curves, as well as investment return paths for index funds, equities, and fixed income assets shall be determined on a stochastic basis using the methodology described in Section 8. If the company uses a proprietary generator to develop scenarios, the company shall demonstrate that the resulting scenarios meet the requirements described in Section 8.

D. Projection of Assets

1. Starting Asset Amount

- a. For the projections of accumulated deficiencies, the value of assets at the start of the projection shall be set equal to the approximate value of statutory reserves at

the start of the projection plus the allocated amount of PIMR attributable to the assets selected. Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:

- i. Any hedge instruments held in support of the contracts being valued; and
  - ii. An amount of assets held in the general account equal to the approximate value of statutory reserves as of the start of the projections less the amount in (i).
- b. If the amount of initial general account assets is negative, the model should reflect a projected interest expense. General account assets chosen for use as described above shall be selected on a consistent basis from one reserve valuation hereunder to the next.
2. Valuation of Projected Assets

For purposes of determining the projected accumulated deficiencies, the value of projected assets shall be determined in a manner consistent with their value at the start of the projection. For assets assumed to be purchased during a projection, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics. However, for derivative instruments that are used in hedging and are not assumed to be sold during a particular projection interval, the company may account for them at an amortized cost in an appropriate manner elected by the company.

**Guidance Note:** Accounting for hedge assets should recognize any methodology prescribed by a company's state of domicile.

3. General Account Assets
- a. General account assets shall be projected, net of projected defaults, using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested in a manner that is representative of and consistent with the company's investment policy, subject to the following requirements:
    - i. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments or a fixed or floating rate interest basis, shall be determined by the company as part of the model representation;
    - ii. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the projected Treasury Department curve along the relevant scenario and the requirements for gross asset spread assumptions stated below;

- iii. For purchases of public non-callable corporate bonds, follow the requirements defined in VM-20 Sections 7.E, 7.F and 9.F. The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four;
- iv. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in VM-20 Section 9.F for interest rate swap spreads;
- v. For purchases of other fixed income investments, if included in the modeled company investment strategy, set assumed gross asset spreads over U.S. Treasuries in a manner that is consistent with, and results in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.

b. Notwithstanding the above requirements, the aggregate reserve shall be the higher of that produced by the modeled company investment strategy and any non-prescribed asset spreads shall be adjusted as necessary so that the aggregate reserve is not less than that which would be obtained produced by substituting an alternative investment strategy in which all the fixed income reinvestment assets have the same weighted average life (WAL) as the reinvestment assets in the modeled company investment strategy and are all public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of:

- i. ~~5%~~ Treasury
- ii. ~~15%~~ 20% PBR credit rating 3 (Aa2/AA)
- iii. ~~40%~~ 80% PBR credit rating 6 (A2/A)
- iv. ~~40%~~ PBR credit rating 9 (Baa/BBB)

c. Any disinvestment shall be modeled in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable, provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period, taking into account duration, ratings, and other attributes of the borrowing mechanism. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with, but not necessarily the same as, the gross asset spreads in Section 4.D.4.a.iii and Section 4.D.4.a.iv, recognizing that initial assets that mature during the projection may have different characteristics than modeled reinvestment assets.

Commented [X310]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22311R310]: Edits to address this comment will be reflected in next exposure

Commented [CD312]: should this be "stochastic reserve", since this is within Section 4: Determination of Stochastic Reserve

Commented [VM22313R312]: Edits to address this comment will be reflected in next exposure

Commented [X314]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22315R314]: Edits to address this comment will be reflected in next exposure

Commented [CD316]: Suggest making this plural ("Treasuries") to be consistent with Section 13.B.9

Commented [VM22317R316]: Edits to address this comment will be reflected in next exposure

Commented [X318]: The proposed reinvestment mix comes from a different assumption context in current VM-22, i.e., it is designed to calculate the maximum allowed valuation interest rates, while the reinvestment mix for VM-22 PBR draft is to put a guardrail around the fixed income reinvestment assets. A guardrail is not intended to identify outliers and should not be tied to an average. The biggest concern is with the higher allocation percentage in BBB assets. The valuation manual should build an appropriate level of conservatism in the valuation standards instead of reflecting industry trends. By moving from VM-20 and VM-21 required mix of 50%/50% AA/A to the proposed mix, the gross spreads increased by 20-30 bps for almost all WAL. We do not object to using a lower credit quality guardrail to get rid of any excessive conservatism. We recommend considering and comparing with other alternative allocations, something between the current and the proposed, e.g., 20% AA and 80% A. This will help regulators make informed decisions. In any case, we should be consistent with VM-20 and VM-21. If a change is made, it needs to be for all three.

Commented [VM22319R318]: Varying opinions among the Subgroup. Voted to revisit and determine the guardrail after the field test.

Commented [CD320]: These references should be Section 4.D.3.a.iii and 4.D.3.a.v

Commented [VM22321R320]: Edits to address this comment will be reflected in next exposure



**Guidance Note:** This limitation is being referred to Life Actuarial (A) Task Force for review. The simple language above “provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period” is not intended to impose a literal requirement. It is intended to reflect a general concept to prevent excessively optimistic borrowing assumptions. It is recognized that borrowing parameters and rules can be complicated, such that modeling limitations may not allow for literal compliance, in every time step, as long as the reserve is not materially affected. However, if the company is unable to fully apply this restriction, prudence dictates that a company shall not allow borrowing assumptions to materially reduce the reserve.

4. Cash Flows from Invested Assets

a. Cash flows from general account fixed income assets, including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario.
- ii. Reflect asset default costs as prescribed in VM-20 Section 9.F and anticipated investment expenses through deductions to the gross investment income.
- iii. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.
- iv. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns or other economic values directly in the projection of asset cash flows. Asset defaults are not subject to this requirement, since asset default assumptions must be determined by the prescribed method in VM-20 Sections 7.E, 7.F and 9.F as noted in 4.a.ii above.

b. Cash flows from general account index funds and general account equity assets—i.e., non-fixed income assets having substantial volatility of returns, such as common stocks and real estate— including starting and reinvestment assets, shall be reflected in the projection as follows:

- i. Determine the grouping for asset categories and the allocation of specific assets to each category in a manner that is consistent with that used for index crediting strategies, as discussed in Section 4.A.2.
- ii. Project the gross investment return including realized and unrealized capital gains in a manner that is consistent with the stochastically generated scenarios.
- iii. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses through a deduction to the gross investment return using prudent estimate assumptions.

**Commented [X322]:** Correct an inaccurate VM section reference. The prescribed asset default spreads assumption should be referred to VM-20 Section 9.F. VM-20 Section 7.E and 7.F are requirements for reinvestment assets, disinvestment and cash flows for invested assets. In 7.F, VM-20 just refers to 9.F for defaults.

**Commented [VM22323R322]:** Edits to address this comment will be reflected in next exposure

**Commented [X324]:** Request clarification around the meaning of “general account index funds”.

**Commented [VM22325R324]:** Edits to address this comment will be reflected in next exposure

- c. Cash flows for each projection interval for policy loan assets shall follow the requirements in Section 10.H.

Commented [CD326]: should this reference Section 10.H?

Commented [VM22327R326]: Edits to address this comment will be reflected in next exposure

E. Projection of Annuitization Benefits

1. Assumed Annuitization Purchase Rates

- a. For payouts specified at issue (such as single premium immediate annuities, deferred income annuities, and certain structured settlements), such purchase rates shall reflect the payout rate specified in the contract.

Commented [CD328]: is there a difference between "purchase rates" and "payout rates"? Both terms are used, so that makes the language unclear. If they are the same, suggest sticking with "purchase rates".

Commented [VM22329R328]: Edits to address this comment will be reflected in next exposure

- b. For purposes of projecting future elective annuitization benefits (including annuitizations stemming from the election of a GMIB) and withdrawal amounts from GMWBs, the projected annuitization purchase rates shall be determined assuming that market interest rates available at the time of election are the interest rates used to project general account assets, as determined in Section 4.D.4. In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract.

Commented [X330]: Suggest deleting "In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract." as it appears to be covered by E.1.a.

2. Projected Election of GMIBs, GMWBs and Other Annuitization Options

Commented [VM22331R330]: Edits to address this comment will be reflected in next exposure

- a. For contracts projected to elect future annuitization options (including annuitizations stemming from the election of a GMIB) or for projections of GMWB benefits once the account value has been depleted, the projections may shall assume the contract will stay in force, the projected periodic payments are paid, and the associated maintenance expenses are incurred.

Commented [X332]: Reinstate the parenthetical content "(including annuitizations stemming from the election of a GMIB)" since there are GMIB riders attached to fixed annuity products.

Commented [VM22333R332]: Edits to address this comment will be reflected in next exposure

F. Frequency of Projection and Time Horizon

Commented [X334]: Delete sentence since it repeats 4.E.1.a.

- 1. Use of an annual cash-flow frequency ("timestep") is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of sensitivity to projection frequency should be validated by testing wherein the company should determine that the use of a more frequent—i.e., shorter—time step does not materially increase reserves. A more frequent time increment should always be used when the product features are sensitive to projection period frequency.

Commented [VM22335R334]: Edits to address this comment will be reflected in next exposure

Commented [X336]: Suggest deleting "may" as there appears to be only option.

Commented [VM22337R336]: Edits to address this comment will be reflected in next exposure

Care must be taken in simulating fee income and expenses when using an annual time step. For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption. It is also important that the frequency of the investment return model be linked appropriately to the projection horizon in the liability model. In particular, the horizon should be sufficiently long so as to capture the vast majority of costs (on a present value basis) from the scenarios.

Commented [X338]: Projection Period is already covered in 4.A.6. Should not be in two places with different guidance.

Commented [VM22339R338]: Edits to address this comment will be reflected in next exposure

Commented [X340]: Reinstate the deleted example of "For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption."

**Guidance Note:** As a general guide, the forecast horizon should not be less than 20 years.

Commented [VM22341R340]: Edits to address this comment will be reflected in next exposure

G. Compliance with ASOPs

When determining a stochastic reserve SR, the analysis shall conform to the ASOPs as promulgated from time to time by the ASB.

Under these requirements, an actuary will make various determinations, verifications and certifications. The company shall provide the actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in these requirements and responsibilities arising from each applicable ASOP.

Section 5: Reinsurance Ceded and Assumed

A. Treatment of Reinsurance Ceded in the Aggregate Reserve

1. Aggregate Reserve Pre- and Post-Reinsurance Ceded

As noted in Section 3.B, the aggregate reserve is determined both pre-reinsurance ceded and post-reinsurance ceded. Therefore, it is necessary to determine the components needed to determine the aggregate reserve—i.e., the stochastic reserve, additional standard projection amount, the SR, DR, and/or the reserve amount valued using requirements in VM-A and VM-C, as applicable—on both bases. Sections 5.A.2 and 5.A.3 discuss adjustments to inputs necessary to determine these components on both a post-reinsurance ceded and a pre-reinsurance ceded basis. Note that due allowance for reasonable approximations may be used where appropriate.

2.  
 2. Stochastic Reserve

Reflection of Reinsurance Cash Flows in the DR or SR

- a. In order to determine the aggregate reserve post-reinsurance ceded, accumulated deficiencies, scenario reserves, and the resulting stochastic reserve SR and DR shall be determined reflecting the effects of reinsurance treaties that meet the statutory requirements that would allow the treaty to be accounted for as reinsurance within statutory accounting. This involves including, where appropriate, all projected reinsurance premiums or other costs and all reinsurance recoveries, where the reinsurance cash flows reflect all the provisions in the reinsurance agreement, using prudent estimate assumptions.
  - i. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.
  - ii. All significant terms and provisions within reinsurance treaties shall be reflected. In addition, it shall be assumed that each party is knowledgeable about the treaty provisions and will exercise them to their advantage.

**Guidance Note:** Renegotiation of the treaty upon the expiration of an experience refund provision or at any other time shall not be assumed if such would be beneficial to the company and not beneficial to the counterparty. This is applicable to both the ceding party and assuming party within a reinsurance arrangement.

- iii. If the company has knowledge that a counterparty is financially impaired, the company shall establish a margin for the risk of default by the counterparty. In the absence of knowledge that the counterparty is financially impaired, the company is not required to establish a margin for the risk of default by the counterparty.
- iv. A company shall include the cash flows from a reinsurance agreement or amendment in calculating the stochastic aggregate reserve if such qualifies for credit in compliance with Appendix A-791 of the Accounting Practices and Procedures Manual. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum aggregate reserve by the absolute value of such reductions in surplus.

**Commented [X342]:** The wording and titling may need to be tightened due to clarify which items apply to assumed and ceded reinsurance in the text.

**Commented [VM22343R342]:** Edits to address this comment will be reflected in next exposure

**Commented [X344]:** Delete and just have title be "Reinsurance". Should structure be more like VM-20?

**Commented [X345R344]:** I, II (and III—VM-21 needs edits)

**Commented [VM22346R344]:** Edits to address this comment will be reflected in next exposure

**Commented [CD347]:** "and Assumed" is added here, but there is still only a subsection 5.A that addresses reinsurance ceded (at least in the section header).

**Commented [VM22348R347]:** Edits to address this comment will be reflected in next exposure

**Commented [CD349]:** need to add "and Assumed" here?

**Commented [VM22350R349]:** Edits to address this comment will be reflected in next exposure

**Commented [X351]:** reinstate

**Commented [VM22352R351]:** Edits to address this comment will be reflected in next exposure

**Commented [X353]:** Can take out vague approximation references, since now have a general allowance for appropriate approximations.

**Commented [VM22354R353]:** Edits to address this comment will be reflected in next exposure

**Commented [X355]:** Consistent with VM-20

**Commented [VM22356R355]:** Edits to address this comment will be reflected in next exposure

**Commented [X357]:** VM-20 Section 8.A.1 makes sense here as well.

**Commented [VM22358R357]:** Edits to address this comment will be reflected in next exposure

**Commented [CD359]:** should this be "stochastic reserve"?

**Commented [VM22360R359]:** Edits to address this comment will be reflected in next exposure

**Commented [X361]:** VM-22 draft so far uses aggregate, not minimum.

**Commented [VM22362R361]:** Edits to address this comment will be reflected in next exposure

- b. In order to determine the ~~stochastic reserve~~ SR and DR on a pre-reinsurance ceded basis, accumulated deficiencies, scenario reserves, and the resulting ~~stochastic reserve~~ SR and DR shall be determined ignoring the effects of reinsurance ceded within the projections. Different approaches may be used to determine the starting assets on the ceded portion of the contracts, dependent upon the characteristics of a given treaty:
- i. For a standard coinsurance treaty, where the assets supporting the ceded liabilities were transferred to the assuming reinsurer, one acceptable approach involves a projection based on using starting assets on the ceded portion of the policies that are similar to those supporting the retained portion of the ceded policies or supporting similar types of policies. Scaling up each asset supporting the retained portion of the contract is also an acceptable method.

**Guidance Note:** For standard pro rata insurance treaties ~~(does that do not include experience refunds)~~, where allocated expenses are similar to the renewal expense allowance, reflecting the quota share applied to the present value of future reinsurance cash flows pertaining to the reinsured block of business may be considered as a possible approach to determine the ceded reserves.

- ii. Alternatively, a treaty may contain an identifiable portfolio of assets associated with the ceded liabilities. This could be the case for several forms of reinsurance: funds withheld coinsurance; modified coinsurance; coinsurance with a trust. To the extent these assets would be available to the cedant, an acceptable approach could involve modeling this portfolio of assets. To the extent that these assets were insufficient to defease the ceded liabilities, the modeling would partially default to the approach discussed for a standard coinsurance treaty. To the extent these assets exceeded what might be needed to defease the ceded liabilities (perhaps an over collateralization requirement in a trust), the inclusion of such assets shall be limited.

**Guidance Note:** Section 3.5.2 in ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*, provides possible methods for constructing a hypothetical pre-reinsurance asset portfolio, if necessary, for purposes of the pre-reinsurance reserve calculation.

- c. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
- d. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the NGE in reinsurance cash flows, the company shall include, but not be limited to, the following:
- i. The usual and customary practices associated with such agreements.
  - ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
  - iii. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
  - iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.

Commented [X363]: Correct phrasing.

Commented [VM22364R363]: Edits to address this comment will be reflected in next exposure

- v. Actions that might be taken by a party if the counterparty is in financial difficulty.
- e. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:
  - i. Stochastically model the risk factors directly in the cash-flow model when calculating the SR.
  - ii. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the SR to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is longevity reinsurance.

### 3. Reserve Determined Upon Passing the Exclusion Test

If a company passes the stochastic exclusion test and elects to use a methodology pursuant to applicable Sections VM-A and VM-C, as allowed in Section 3.E, it is important to note that the methodology produces reserves on a pre-reinsurance ceded basis. Therefore, the reserve must be adjusted for any reinsurance ceded accordingly. In addition, reserves valued under applicable Sections in VM-A and VM-C, unadjusted for reinsurance, shall be applied to the contracts falling under the scope of these requirements to determine the aggregate reserve prior to reinsurance.

It should be noted that the ~~pre-reinsurance-ceded~~ and ~~post-reinsurance-ceded~~ reserves may result in different outcomes for the exclusion test. In particular, it is possible that the ~~pre-reinsurance-ceded~~ reserves would pass the relevant exclusion test (and allow the use of VM-A and VM-C) while the ~~post-reinsurance-ceded~~ reserves might not, or vice versa.

### 4. Additional Standard Projection Amount

Where reinsurance is ceded, the additional standard projection amount shall be calculated as described in Section 6 to reflect the reinsurance costs and reinsurance recoveries under the reinsurance treaties. The additional standard projection amount shall also be calculated pre-reinsurance ceded using the methods described in Section 6 but ignoring the effects of the reinsurance ceded.

**Commented [X365]:** VM-20 Section 8.C.7 seems particularly applicable. We encourage others to also review VM-20 Section 8 for other sections that should also apply. VM-20 Section 8 is much more developed than VM-20 Section 5 with many more considerations for assumption setting, and we would suggest the VM-22 subgroup consider rewriting starting with VM-20 instead of VM-21.

**Commented [VM22366R365]:** Subgroup agreed with reflecting this language in the VM-22 draft

**Commented [VM22367]:** Per discussion on how to model mortality for longevity reinsurance, the VM-22 Subgroup decided to port over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk.

**Commented [X368]:** Both referring to reinsurance ceded. Should be clarified.

**Commented [VM22369R368]:** Edits to address this comment will be reflected in next exposure

**Commented [X370]:** ceded

**Commented [VM22371R370]:** Edits to address this comment will be reflected in next exposure

**Commented [X372]:** ceded

**Commented [VM22373R372]:** Edits to address this comment will be reflected in next exposure

**Commented [X374]:** Opposite could also be true.

**Commented [VM22375R374]:** Edits to address this comment will be reflected in next exposure

**Commented [X376]:** The current VM-21 language here looks to work for VM-22 without needing to know the specific assumptions, etc., for the SPA.

**Commented [VM22377R376]:** Edits to address this comment will be reflected in next exposure

Section 6: Standard Projection Amount To Be Determined

**Commented [VM22378]:** NY Comment Letter: Current CARVM standards should be a minimum floor for VM-22 policies, and only the stochastic reserve should permit grouping whereas the minimum floor should be seriatim.

**Commented [X379]:** SPA Section placement here still makes sense, but SPA under development.

**Commented [VM22380R379]:** Edit to update the title of this section will be reflected in next exposure

**Commented [VM22381]:** Refer to equitable comment letter, which expresses support for the standard projection amount as a binding floor, with the suggestion to rely on company-specific assumptions for insignificant assumptions that are difficult to develop.

**Commented [NJ382]:** Once this is written, the language from 4.A.1.a for longevity reinsurance could be added here as well, i.e. the standard projection would use net premiums based on the k factor approach, using the standard projection prescribed assumptions. Floor on std projection is at the contract level

| Section 6: To Be Determined



Section 7: Exclusion Testing

A. Stochastic Exclusion Test Requirement Overview

1. The company may elect to exclude one or more groups of contracts from the stochastic reserve SR calculation if the stochastic exclusion test (SET) is satisfied for each of the group of contracts. The company has the option to calculate or not calculate the SET.
  - a. If the company does not elect to calculate the SET for one or more groups of contracts, or the company calculates the SET and fails the test for such groups of contracts, the reserve methodology described in Section 4 shall be used for calculating the aggregate reserve for those groups of contracts.
  - b. If the company elects to calculate the SET for one or more groups of contracts, and passes the test for such groups of contracts, then for each group of contracts that passes the SET, the company shall choose whether or not to use the reserve methodology described in Section 4 for those groups that group of contracts. If the reserve methodology described in Section 4 is not used for one or more groups of contracts, then the company shall use the reserve methodology pursuant to applicable requirements in VM-A and VM-C to calculate the aggregate reserve for those groups of contracts.
  - c. A company may not exclude a group of contracts from the stochastic reserve SR requirements if there are one or more future hedging strategies/programs associated with supporting the contracts, with the exception of hedging programs solely supporting index credits as described in Section 9.A.1.
  - d. A company may elect to automatically exclude one or more groups of policies from the stochastic reserve calculation without passing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
    - i. All of the contracts are either:
      - Single Premium Immediate Annuities,
      - Term Certain Payout Annuities, or
      - Structured Settlement Contracts;
    - ii. None of the contracts are pension risk transfer annuities (PRT) or are covered under a longevity reinsurance agreement;
    - iii. Future payout benefits are either level or stay within 5% of the initial payout benefit amount over time;
    - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
    - v. The average [Macauley duration] of the liabilities of the contracts as measured from the issue date (or premium determination date) is less than [X].

B. Requirement to Pass the Types of Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

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**Commented [X383]:** Need to modify exclusion testing section to reflect SPA.

**Commented [NJ384]:** Longevity reinsurance likely to be scoped out of the stochastic reserve unless the stochastic reserve includes consideration of stochastic mortality. If it stays as stochastic interest only, then it probably does make sense that it would meet the exclusion testing. For exclusion testing, the k factor approach should continue to apply, and it should not be combined with other blocks of business

**Commented [X385]:** inconsistent groups vs. group references.

**Commented [VM22386R385]:** Edits to address this comment will be reflected in next exposure

**Commented [CD387]:** should this be "stochastic reserve", since Section 4 is about determining the stochastic reserve.

**Commented [VM22388R387]:** Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve if not using the SET

**Commented [X389]:** Decision is independent for each group the SET is performed on.

**Commented [VM22390R389]:** Edits to address this comment will be reflected in next exposure

**Commented [CD391]:** suggest deleting this highlighted part of the sentence

**Commented [VM22392R391]:** Edits to address this comment will be reflected in next exposure

**Commented [CD393]:** see earlier comment about the phrase "future hedge program" being confusing.

**Commented [X394]:** Is "associated with the contracts" the same as the earlier use of "supporting the contracts"? Should the same verbiage be used here? If there is asset hedging for the assets supporting the contracts, it should be included. Need to define "solely supporting" index credits, and also have criteria on the effectiveness/error and documentation of any such hedging that is allowed for excluded business.

**Commented [VM22395]:** subgroup voted to permit PRTs below certain duration to automatically pass the exclusion test, assuming there is limited optional level/near-level payments, and not PRT or longevity reinsurance. The Academy has agreed to develop a proposed duration threshold.

**Commented [VM22396]:** New language drafted by select Subgroup Members to provide certain condition... [81]

**Commented [CD397]:** Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstratic... [82]

**Commented [VM22398R397]:** Edits to address this comment will be reflected in next exposure

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date~~within 12 months before the valuation date~~ the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. ~~SET~~ Certification Method—For groups of contracts that do not have guaranteed living benefits, future hedging programs, strategies, or pension risk transfer business, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material aggregate risk levels across interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments). ~~The company shall provide the certification and documentation supporting the certification to the commissioner upon request.~~

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

- a) A demonstration that, ~~using requirements under VM-A and VM-C for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great as the assets required to support the group of contracts and certificates using the company’s cash-flow testing model under each of the +648 scenarios identified in this section~~ Section 7.C.1 or alternatively each of the New York seven scenarios-economic scenarios- under each of the three mortality adjustment factors identified in Section 7.C.1.
- b) A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in ~~its~~ interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
- c) A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company’s non-guaranteed elements (NGEs) policy, assets backing the group of contracts, ~~the company’s longevity risk, and the company’s investment strategy.~~

C. Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the ~~stochastic reserve~~ SR requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of (b-a)/a is less than ~~the greater of [x]% where and the percentage change that would trigger the company’s materiality standard, where:~~

Commented [CD399]: not sure why this part is deleted. Suggest adding it back in.

Commented [VM22400R399]: Edits to address t... [83]

Commented [X401]: We recommend removing... [84]

Commented [VM22402R401]: Subgroup voted t... [85]

Commented [CD403]: See earlier comments abou... [86]

Commented [VM22404R403]: The Subgroup dec... [87]

Commented [X405]: Needs to be defined.

Commented [VM22406R405]: The Subgroup dec... [88]

Commented [X407]: Needs a comma

Commented [VM22408R407]: Edits to address t... [90]

Commented [CD409]: need comma after "business"

Commented [VM22410R409]: Edits to address t... [89]

Commented [CD411]: what is meant by "aggrega... [91]

Commented [VM22412R411]: Edits to address t... [92]

Commented [X413]: This is not in VM-20 and wo... [93]

Commented [VM22414R413]: Edits to address t... [94]

Commented [X415]: This is covered by VM-31

Commented [VM22416R415]: Edits to address t... [95]

Commented [CD417]: note, there is no insertion... [96]

Commented [VM22418R417]: Edits to address t... [97]

Commented [CD419]: This wording is a little clun... [98]

Commented [VM22420R419]: Edits to address t... [99]

Commented [X421]: Replace all "contracts" with... [101]

Commented [VM22422R421]: Edits to address... [100]

Commented [X423]: Need mortality stresses if using NY7

Commented [X424]: Need complete list of risks

Commented [VM22425R424]: Edits to address... [102]

Commented [CD426]: need to insert "longevity risk" here

Commented [VM22427R426]: Edits to address... [103]

Commented [X428]: Need complete list of risks

Commented [VM22429R428]: Edits to address... [104]

Commented [X430]: Need to add a review of th... [105]

Commented [VM22431R430]: Edits to address... [106]

Commented [X432]: ~~written, the SERT assum~~... [107]

Commented [VM22433R432]: Consensus to us... [108]

Commented [X434]: ~~long (a) in the denomina~~... [109]

Commented [VM22435R434]: Consensus to us... [110]

Commented [X436]: The variability should be as... [111]

- a. a = the adjusted scenario reserve described in Paragraph 7.C.2.a below using economic scenario 9, and 100% as the adjustment factor for mortality, the baseline economic scenario, as described in Appendix 1.E of VM-20.
- b. b = the largest adjusted scenario reserve described in Paragraph 7.C.2.b below under any of the other 15 economic scenarios described in Appendix 1.E of VM-20 under both [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company's margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company's margin for this exercise.

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve for scenarios other than the baseline economic scenario, minus the adjusted scenario reserve for the baseline economic scenario, and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of b.

2. In calculating the ratio in subsection (Section 7.C.1) above:

- a. The company shall calculate an adjusted scenario reserve for the group of contracts for each of each of the 16 scenario economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:
  - i. The scenario reserve defined in Section 4, but with the following differences:
    - a) Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Paragraph Section 7.C.1.b of this section.
    - b) Using the interest rates and equity return assumptions specific to each scenario.
    - c) Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
    - d) Shall reflect future mortality improvement in line with anticipated experience assumptions.
    - e) Shall not reflect correlation between longevity and economic risks.
  - ii. The gross premium reserve developed from the cash flows from the company's asset adequacy analysis models, using the experience assumptions of the company's cash-flow analysis, but with the following differences:
    - a) Using the interest rates and equity return assumptions specific to each scenario.

- Commented [X437]: Correcting reference
- Commented [VM22438R437]: Edits to address this comment will be reflected in next exposure
- Commented [CD439]: better to keep the reference to the full Section (i.e., Section 7.C.2.a.i)
- Commented [VM22440R439]: Edits to address this comment will be reflected in next exposure
- Commented [X441]: Correcting reference
- Commented [VM22442R441]: Edits to address this comment will be reflected in next exposure
- Commented [CD443]: better to keep the reference to the full Section (i.e., Section 7.C.2.b)
- Commented [VM22444R443]: Edits to address this comment will be reflected in next exposure
- Commented [X445]: Need to modify in case largest result is just from the mortality stress on the same scenario.
- Commented [VM22446R445]: Edits to address this comment will be reflected in next exposure
- Commented [X447]: Need to modify in case largest result is just from the economic stress on the same mortality level.
- Commented [VM22448R447]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X449]: Need to ensure we have captured a prudent level of mortality variation for any given company in this test.
- Commented [VM22450R449]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X451]: Updating to reflect mortality/economic scenario combinations.
- Commented [VM22452R451]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X453]: For clarity
- Commented [VM22454R453]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X455]: Be consistent with standard VM references
- Commented [VM22456R455]: Edits to address ... [114]
- Commented [CD457]: better to keep the referenc ... [113]
- Commented [VM22458R457]: Edits to address ... [112]
- Commented [CD459]: why delete this? seems ... [116]
- Commented [VM22460R459]: Edits to address ... [115]
- Commented [X461]: Be consistent with standar ... [117]
- Commented [VM22462R461]: Edits to address ... [118]
- Commented [CD463]: better to reference the f ... [119]
- Commented [VM22464R463]: Edits to address ... [120]

- b) Using the mortality scalars described in ~~Paragraph~~ Section 7.C.1.b of this section.
  - c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the company's cash-flow testing assumptions for default costs and reinvestment earnings.
- b. ~~The company shall use the most current 46 available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.~~
- c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
- d. ~~The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.~~
- e. ~~If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to not conduct the stochastic exclusion ratio test under only a pre-reinsurance-ceded basis upon determining the , either pre-reinsurance-ceded basis upon determining the prior post-reinsurance-reserve-ceded-aggregate reserve.~~
3. ~~If the ratio calculated in this section is less than [x]% pre-non-proportional reinsurance, but is greater than [x]% post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.~~
- a. An example of an acceptable demonstration:
    - i. For convenience in notation • SERT = the ratio (b-a)/a defined in Section 7.C.1 above
      - a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted SERT<sub>gn</sub>
      - b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted SERT<sub>nn</sub>
    - ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.

**Commented [X465]:** Be consistent with standard VM references

**Commented [VM22466R465]:** Edits to address this comment will be reflected in next exposure

**Commented [CD467]:** better to reference the full Section

**Commented [VM22468R467]:** Edits to address this comment will be reflected in next exposure

**Commented [X469]:** No reason for change/inconsistency with other chapters - reject edit.

**Commented [VM22470R469]:** Edits to address this comment will be reflected in next exposure

**Commented [X471]:** Clarification is needed around reference to “significantly different risk profiles”.

**Commented [VM22472R471]:** Subgroup voted to use the “significantly different risk profiles” language for the exclusion test, consistent with VM-20.

**Commented [CD473]:** to be more specific, say “stochastic exclusion ratio test”

**Commented [VM22474R473]:** Edits to address this comment will be reflected in next exposure

**Commented [X475]:** Original did not make sense. Also, the point is that you just need one basis, either pre-reinsurance or post-reinsurance.

**Commented [VM22476R475]:** Edits to address this comment will be reflected in next exposure

**Commented [X477]:** We request clarification or definition of the term “non-proportional reinsurance”.

**Commented [X478]:** Does this make sense for VM-20 as well?

**Commented [VM22479R478]:** Subgroup to only focus on VM-22 for now

iii. So, if  $SERT_{gn} \leq [x]_{T-1}\%$  but  $SERT_{nn} > [x]_{T-1}\%$ , then compute the largest percent increase in reserve (LPIR) =  $(b-a)/a$ , both “gross of non-proportional” and “net of non-proportional.”

$$LPIR_{gn} = (b_{gy} - a_{gy}) / (b_{gn} - a_{gn}) / a_{gn}$$

$$LPIR_{nn} = (b_{ny} - a_{ny}) / (b_{nn} - a_{nn}) / a_{nn}$$

Note that the scenario underlying  $b_{gn}$  could be different from the scenario underlying  $b_{nn}$ .

If  $SERT_{gn} \times LPIR_{nn} / LPIR_{gn} < [x]_{T-1}\%$ , then the block of contracts passes the SERT.

b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 1648 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.

4. The SERT may not be used for a group of contracts if, using the current year’s data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method in this section of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in this section and concluded that such certification could not legitimately be made.

D. Stochastic Exclusion Demonstration Test

1. In order to exclude a group of contracts from the stochastic reserve SR requirements using the methodology in this section Stochastic Exclusion Demonstration Test, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:

a. The demonstration shall provide a reasonable assurance that if the stochastic reserve SR was calculated on a stand-alone basis for the group of contracts subject to the stochastic reserve SR exclusion, the resulting stochastic reserve for those groups of contracts would not be higher than the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of contracts from the stochastic reserve SR requirements.

b. If, as of the end of any calendar year, the company determines the aggregate statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C for the group of contracts no longer adequately provides for all material risks, the exclusion shall be discontinued, and the company fails the SERT SET for those contracts.

c. The demonstration may be based on analysis from a date that precedes the valuation date for the initial year to which it applies if the demonstration includes an

Commented [X480]: We believe subscript “gy” should be “gn”.

Commented [VM22481R480]: Edits to address this comment will be reflected in next exposure

Commented [X482]: % missing

Commented [VM22483R482]: Edits to address this comment will be reflected in next exposure

Commented [X484]: Note that LPIR is just the SERT using the VM-22 formulation (b-a)/a.

Commented [VM22485R484]: Edits to address this comment will be reflected in next exposure

Commented [X486]: The first and last terms on the left side of this equation cancel out, so it just ends up with needing to pass the SERT on the net basis again. This worked when (c) was the denominator, but now with (a) in the denominator this adjustment is meaningless. Take out the whole example, or revise the SERT to use benefits in the denominator again. Or some new formulation for SERT.

Commented [VM22487R486]: Updated denominator, addressing this issue

Commented [X488]: In VM-20, it is only prohibited for the clearly sufficiently robust attempts of the demonstration method where failing shows the SR would be greater. The other two options could have been incomplete demonstrations and not necessarily imply the SR would be dominant.

Commented [X489]: Clearer language

Commented [VM22490R489]: Edits to address this comment will be reflected in next exposure

Commented [X491]: Does this statement imply a floor reserve of VM-A and VM-C? VM-20 does require the NPR as the floor of the reserve but as written, VM-22 does not require a floor reserve. Recommend removing 1.a. Same statement with the 2.a statement demonstration. This requirement does not apply to the other permitted tests, which seemed counterintuitive.

Commented [CD492]: should this, instead, refer to the “statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C?”

Commented [VM22493R492]: Edits to address this comment will be reflected in next exposure

Commented [X494]: Typo is also in VM-20

Commented [VM22495R494]: Will follow-up upon addressing VM-30 disclosure requirements

explanation of why the use of such a date will not produce a material change in the outcome, as compared to results based on an analysis as of the valuation date.

- d. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques, such as derivative programs and reinsurance.

2. The company may use one of the following or another method acceptable to the insurance commissioner to demonstrate compliance with ~~subsection~~Section 7.D.1 above:

- a. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis.
- b. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios.
- c. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis, but using a representative sample of contracts in the ~~stochastic reserve~~SR calculations.
- d. Demonstrate that any risk characteristics that would otherwise cause the ~~stochastic reserve~~SR calculated on a stand-alone basis to exceed the statutory reserve calculated in accordance with VM-A and VM-C, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance or passing the risk on to the ~~contract policyholder~~ by contract provision.

E. Deterministic Certification Option

1. The company ~~has the option to may~~ determine the ~~stochastic reserve~~SR for a group of contracts using a single deterministic economic scenario, subject to the following conditions.

- a. The company certifies that economic conditions do not materially influence anticipated contract holder behavior for the group of ~~policies, contracts and certificates~~. Examples of contract holder options that are materially influenced by economic conditions include surrender benefits, recurring premium payments, and guaranteed living benefits.
- b. The company certifies that the group of ~~policies, contracts and certificates~~ is not supported by a reinvestment strategy that contains ~~future hedge purchases~~.
- c. ~~The company must perform and disclose results from the stochastic exclusion ratio test following the requirements in Section 7.C, thereby disclosing and the scenario reserve volatility across various company must pass the SERT when considering only the 16 economic scenarios, paired with the 100% mortality scenario.~~

Commented [CD496]: should say "Section"

Commented [VM22497R496]: Edits to address this comment will be reflected in next exposure

Commented [CD498]: "contract holder"

Commented [VM22499R498]: Edits to address this comment will be reflected in next exposure

Commented [X500]: Need SPA for DR as well as SR

Commented [CD501]: suggest saying "may" instead of "has the option to"

Commented [VM22502R501]: Edits to address this comment will be reflected in next exposure

Commented [CD503]: "contracts"

Commented [VM22504R503]: Edits to address this comment will be reflected in next exposure

Commented [X505]: Clarify if this was the intent to exclude contracts supported by index hedging.

Commented [X506]: This is needed to assure the SR is not needed. Otherwise, this section is incomplete and does not support using a DR.

Commented [VM22507R506]: Subgroup agrees with including the 100% mortality scenario.

- d. The company must disclose a description of contracts and associated features in the certification.

~~Drafting Note: Consider revisiting Paragraph E.1.c to possibly either require i) falling below a preset threshold for the exclusion ratio test under a single longevity/mortality scenario; or ii) to pass the exclusion test if longevity is not included as part of the ratio test.~~

2. The ~~stochastic reserve~~SR for the group of contracts under the Deterministic Certification Option is determined as follows:

- a. Cash flows are projected in compliance with the applicable requirements in Section 4, Section 5, Section 10, and Section 11 of VM-22 over a single economic scenario (scenario 12 found in Appendix 1 of VM-20).
- b. The ~~stochastic reserve~~SR equals the scenario reserve following the requirements for Section 4.

~~Guidance Note: The Deterministic Certification Option is intended to provide a non stochastic option for Single Premium Immediate Annuities (SPIAs) and similar payout annuity products that contain limited or no optionality in the asset and liability cash flow projections.~~

Commented [X508]: ~~agree with drafting note. Edit above~~

Commented [VM22509R508]: Subgroup agrees with including the 100% mortality scenario.

Commented [X510]: It may not be appropriate to use scenario 12 to calculate the scenario reserve for SPIA. See this article <https://www.soa.org/sections/financial-reporting/financial-reporting-newsletter/2021/july/fr-2021-07-su/>

"in an increasing interest rate environment for business where policyholder behavior is sensitive to prevailing interest rates, life insurers may face an increase in disintermediation risk (i.e., the risk of having to sell assets, potentially at a loss, to fund policyholder surrender benefits) For example, rising interest rates, particularly sudden jumps (e.g., New York 7 pop-up scenario with an immediate interest rate increase of 3 percent), may lead to higher actual and projected policyholder surrenders as policyholders seek out higher yielding investment opportunities. These increasing cash demands may require fixed income assets to be sold at depressed prices, and resultant projected losses (or lower gains) may result in reserve insufficiencies, necessitating the need for AAT reserves."

Commented [X511]: Recommend deleting guidance note, as it doesn't provide full or clear scope of what may be excluded, so could be misread to either guarantee option for certain products or exclude the option for other products.

Section 8: To Be Determined (Scenario Generation for VM-21)



Section 9: Modeling Hedges under a ~~Future Non-Index Credit~~ Future Hedging Strategy

A. Initial Considerations

1. This section applies to modeling of hedges other than situations where the company (a) only hedges index credits. ~~If the company, or (b) clearly separates index credit hedging from other hedging, then only the section only pertains to the other hedging if the index hedging follows. In those situations, the modeling of hedges supporting index credits can be simplified including applying an index credit hedge margin, following the requirements in Section 4.A.4.b.i.~~
2. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the calculation of the ~~stochastic reserve~~SR, determined in accordance with Section 3.D and Section 4.D.
3. The company shall take into account the costs and benefits of hedge positions expected to be held by the company in the future along each scenario. Company management is responsible for developing, documenting, executing and evaluating the investment strategy for future hedge purchases. ~~Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months, including the hedging strategy, used to implement the investment policy.~~
4. For this purpose, the investment assets refer to all the assets, including derivatives supporting covered products and guarantees. This also is referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which also is referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. There is no attempt to distinguish what is the hedging portfolio and what is the investment portfolio in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.
5. This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the stochastic cash-flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

B. Modeling Approaches

1. The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two types of methods as described below. Although a hedging strategy normally would be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the ~~stochastic reserve~~SR otherwise calculated. Particular attention should be given to Section 1.B Principle 5 for the modeling of future hedging strategies.
2. The fundamental characteristic of the first type of method, referred to as the “explicit method,” is that hedging positions and their resulting cash flows are included in the stochastic cash-flow model used to determine the scenario reserve, as discussed in Section 3.D, for each scenario.

**Commented [X512]:** Section 4.A.4 (Modeling of Hedges) has some relationship with this section, we request clarification around the applicability of these two areas of hedge guidance.

**Commented [VM22513R512]:** Edits to address this comment will be reflected in next exposure

**Commented [CD514]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22515R514]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD516]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [VM22517R516]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [X518]:** We seek clarification of this text: if a company only hedges indices or separates index crediting from other hedges, does this apply, or does it only apply to any other hedging?

**Commented [VM22519R518]:** Edits to address this comment will be reflected in next exposure

**Commented [X520]:** The sentence “Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months.” seems to suggest you would do something other than the actual hedging strategy after [6] months. In this case, what are you assuming for modeling? We suggest clarification of this sentence.

**Commented [VM22521R520]:** Edits to address this comment will be reflected in next exposure

**Commented [CD522]:** is this a typo? should this be "purchases"?

**Commented [VM22523R522]:** Edits to address this comment will be reflected in next exposure

**Commented [X524]:** This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Ins: ... [121]

**Commented [VM22525R524]:** Edits to address this comment will be reflected in next exposure

**Commented [X526]:** Reinstate the original sentence which puts the reflection of hedging into the great: ... [122]

**Commented [VM22527R526]:** Edits to address this comment will be reflected in next exposure

**Commented [X528]:** Agree that the uncertainty associated with new strategies should be handled: ... [123]

**Commented [VM22529R528]:** Edits to address this comment will be reflected in next exposure

3. The fundamental characteristic of the second type of method, referred to as the “implicit method,” is that the effectiveness of the current hedging strategy on future cash flows is evaluated, in part or in whole, outside of the stochastic cash-flow model. There are multiple ways that this type of modeling can be implemented. In this case, the reduction to the ~~stochastic reserve~~SR otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.
4. Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions) on the ~~stochastic reserve~~SR needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. In addition, the reduction to the ~~stochastic reserve~~SR attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company’s ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect ~~or mock tested~~.

**Guidance Note:** No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transform some risks into others, introduce new risks, or have other imperfections. For example, a delta-only hedging strategy does not adequately hedge the risks measured by the “Greeks” other than delta.

5. A safe harbor approach is permitted for reflection of future hedging strategies supporting the contracts for those companies whose modeled hedge assets comprise only linear instruments not sensitive to implied volatility. For companies with option-based hedge strategies, electing this approach would require representing the option-based portion of the strategy as a delta-rho two-Greek hedge program. The normally modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greeks as the original option portfolio.

C. Calculation of Stochastic ReserveSR (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the future hedging strategies supporting the contracts ~~modeling of hedges~~ (including both currently held and future hedge positions) into the stochastic cash-flow model on a best efforts basis, including all of the factors and assumptions needed to ~~model the hedges~~ execute the future hedging strategies supporting the contracts (e.g., stochastic implied volatility). The determination of CTE70 (best efforts) may utilize either explicit or implicit modeling techniques.
2. The company shall calculate a CTE70 (adjusted) by recalculating the CTE70 assuming the company has ~~no future hedging strategies supporting the contracts~~ strategy except those to hedge interest credits and hedge assets held by the company on the valuation date, therefore following the requirements of Section 4.A.4.a and 4.A.4.b.i.

However, for a company with a future hedging strategy supporting the contracts, existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements may be considered in one of two ways for the CTE70 (adjusted):

**Commented [X530]:** Is delta-only hedging common in VM-22 hedging? Could the example be replaced with something more relevant to VM-22 hedging?

**Commented [X531]:** The Hedging DG is currently working on language and we will want to be consistent across VM-20, VM-21, and VM-22.

**Commented [VM22532R531]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Commented [CD533]:** perhaps better to say “no future hedge purchases...”

**Commented [VM22534R533]:** Edits to address this comment will be reflected in next exposure

- a) Include the asset cash flows from any contractual payments and maturity values in the projection model; or
- b) No hedge positions – in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

- 3. Because most models will include at least some approximations or idealistic assumptions, CTE70 (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the value for the stochastic reserve $SR$  is given by:

$$\text{Stochastic reserve } SR = \text{CTE70 (best efforts)} + E \times \max[0, \text{CTE70 (adjusted)} - \text{CTE70 (best efforts)}]$$

- 4. The company shall specify a value for  $E$  (the “error factor”) in the range from 5% to 100% to reflect the company’s view of the potential error resulting from the level of sophistication of the stochastic cash-flow model and its ability to properly reflect the parameters of the hedging strategy (i.e., the Greeks being covered by the strategy), as well as the associated costs, risks and benefits. The greater the ability of the stochastic model to capture all risks and uncertainties, the lower the value of  $E$ . The value of  $E$  may be as low as 5% only if the model used to determine the CTE70 (best efforts) effectively reflects all of the parameters used in the hedging strategy. If certain economic risks are not hedged, yet the model does not generate scenarios that sufficiently capture those risks,  $E$  must be in the higher end of the range, reflecting the greater likelihood of error. Likewise, simplistic hedge cash-flow models shall assume a higher likelihood of error.

- 5. The company shall conduct a formal back-test, based on an analysis of at least the most recent available relevant period of data (but no less than 12 months), to assess how well the model is able to replicate the hedging strategy in a way that supports the determination of the value used for  $E$ .

- 6. Such a back-test shall involve one of the following analyses:

- a. For companies that model hedge cash flows directly (“explicit method”), replace the stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario that represents the market path that actually manifested over the selected back-testing period and compare the projected hedge asset gains and losses against the actual hedge asset gains and losses – both realized and unrealized – observed over the same time period. For this calculation, the model assumptions may be replaced with parameters that reflect actual experience during the back-testing period. In order to isolate the comparison between the modeled hedge results and actual hedge results for this calculation, the projected liabilities should accurately reflect the actual liabilities throughout the back-testing period; therefore, adjustments that facilitate this accuracy (e.g. reflecting actual experience instead of model assumptions, including new business, etc.) are permissible.

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Commented [X535]: We have been getting weak E factor support, with minimum backtesting due to the current phrasing.

Commented [X536R535]: Recommend adding stress testing language similar to Section 4.A.4.b.i.c) but with edits based on TDI's comments/suggestions to Section 4.A.4.b.i.c).

Commented [VM22537R535]: Edits to address this comment will be reflected in next exposure

Commented [X538]: Recommend adding reporting requirement to VM-31 to disclose if company has switched between explicit method and implicit method, discuss rationale of the change and the change impact.

Commented [VM22539R538]: Edits to address this comment will be reflected in next exposure

To support the choice of a low value of E, the company should ascertain that the projected hedge asset gains and losses are within close range of 100% (e.g., 80–125%) of the actual hedge asset gains and losses. The company may also support the choice of a low value of E by achieving a high R-squared (e.g., 0.80 or higher) when using a regression analysis technique.

- b. For companies that model hedge cash flows implicitly by quantifying the cost and benefit of hedging using the fair value of the hedged item (an “implicit method” or “cost of reinsurance method”), calculate the delta, rho and vega coverage ratios in each month over the selected back-testing period in the following manner:
    - i. Determine the hedge asset gains and losses—both realized and unrealized—incurred over the month attributable to equity, interest rate, and implied volatility movements.
    - ii. Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements. The hedged item should be defined in a manner that reflects the proportion of risks hedged (e.g., if a company elects to hedge 50% of a contract’s market risks, it should quantify the fair value of the hedged item as 50% of the fair value of the contract).
    - iii. Calculate the delta coverage ratio as the ratio between (i) and (ii) attributable to equity movements.
    - iv. Calculate the rho coverage ratio as the ratio between (i) and (ii) attributable to interest rate movements.
    - v. Calculate the vega coverage ratio as the ratio between (i) and (ii) attributable to implied volatility movements.
    - vi. To support the company’s choice of a low value of E, the company should be able to demonstrate that the delta and rho coverage ratios are both within close range of 100 % (e.g., 80–125%) consistently across the back-testing period.
    - vii. In addition, the company should be able to demonstrate that the vega coverage ratio is within close range of 100 % in order to use the prevailing implied volatility levels as of the valuation date in quantifying the fair value of the hedged item for the purpose of calculating CTE70 (best efforts). Otherwise, the company shall quantify the fair value of the hedged item for the purpose of calculating CTE70 (best efforts) in a manner consistent with the realized volatility of the scenarios captured in the CTE (best efforts).
  - c. Companies that do not model hedge cash flows explicitly, but that also do not use the implicit method as outlined in Section 9.C.6.b above, shall conduct the formal back-test in a manner that allows the company to clearly illustrate the appropriateness of the selected method for reflecting the cost and benefit of hedging, as well as the value used for E.
7. A company that does not have 12 months of experience to date shall set E to a value that reflects the amount of experience available, and the degree and nature of any change to the hedge program. For a material change in strategy, with ~~no less than 126 months of~~ experience and without robust mock testing history, E should be at least 1.50. For a

material change in strategy, with no less than 3 months of history, E should be 1.0. However, when a material change in hedging strategy with less than 3 months history is the introduction of hedging for a newly introduced product or newly acquired block of business and is supplemented by robust mock testing, E should instead be at least 0.3. Moreover, with prior approval from the domestic regulator, material changes in hedge strategy with less than 3 months history but with robust mock testing may have error factors less than 1.0, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for additional uncertainty in anticipated hedging experience beyond that of a robust hedging program already in existence. However, E may be lower than 1.0-50 if ~~some~~ at least 6 months of reliable experience is available and/or if the change in strategy is a minor refinement rather than a ~~substantial~~ material change in strategy, though still subject to the minimum error factor specified in Section 9.C.4 and with an appropriate prudent estimate to account for any additional uncertainty associated with the refinement.

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily large (e.g.,  $\geq 5100\%$ ) for substantial changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy) ~~without robust mock-testing where the company has not been able to provide a meaningful simulation of hedge performance based on the new strategy.~~
- An increase in the error factor may not always be needed for minor refinements to the hedge strategy (e.g., moving from swaps to Treasury futures).
- A temporary moderate increase (e.g., 15–30%) in error factor should be used for ~~substantial modifications to hedge programs or modeling where meaningful simulation has not been created (e.g., adding second order hedging, such as gamma or rate convexity).~~
- No increase in the error factor may be used for incremental modifications to the hedge strategy (e.g., adding death benefits to a program that previously covered only living benefits, or moving from swaps to Treasury Department futures).

8. The company shall set the value of E reflecting the extent to which the future hedging program is clearly defined. To support a value of E below 1.0, there should be very robust documentation outlining the future hedging strategies program. To the extent that documentation outlining any of the future hedging strategies program is incomplete, the value of E shall be increased. In particular, the value of E shall be 1.0 if documentation is materially incomplete for any of the individual CDHS attributes (a) through (j), as listed in VM-01.

Any increases required to the value of E to reflect that documentation is not available to support that the future hedging strategies program are clearly defined shall be in addition to increases to the value of E to reflect a lack of historical experience or to reflect the backtesting results, subject to an overall ceiling of 1.0 for E.

**Guidance Note:** Companies must use judgment both in determining an E factor and in applying this requirement in the case where there are multiple future hedging strategies, particularly where some may be CDHS and some may not be CDHS. In this case, the SR should be ensured to be no less than the CTE(70) reflecting the future hedging strategies

**Commented [X540]:** 6 month restriction should be handled in the error factor. Other language for clarity. Edited guidance note below to be consistent with this.

**Commented [VM22541R540]:** Edits to create consistency with recently adopted APF 2020-12 will be considered for the next exposure

**Commented [X542]:** Work is being done by the hedging DG. This is a placeholder. Need to reflect how clearly defined and well documented the hedge program is, to be able to rely on the backtesting provided. To the extent that hedge programs are not clearly defined, E should be increased to reflect that the backtesting cannot be relied on as an indicator of future effectiveness.

**Commented [VM22543R542]:** The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

that are CDHS and not reflecting those that are not CDHS. Companies with multiple future hedging strategies with very different levels of effectiveness or with multiple future hedging strategies that include both CDHS and non-CDHS should discuss with their domestic regulator.

E. Additional Considerations for CTE70 (best efforts)

If the company is following one or more future hedging strategies supporting the contracts-a CDHS, the fair value of the portfolio of contracts falling within the scope of these requirements shall be computed and compared to the CTE70 (best efforts) and CTE70 (adjusted). If the CTE70 (best efforts) is below both the fair value and CTE70 (adjusted), the company should be prepared to explain why that result is reasonable.

For the purposes of this analysis, the SR and fair value calculations shall be done without requiring the scenario reserve for any given scenario to be equal to or in excess of the cash surrender value in aggregate for the group of contracts modeled in the projection.

D. Specific Considerations and Requirements

1. As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the stochastic reserve SR, the company should review actual historical hedging effectiveness. The company shall evaluate the appropriateness of the assumptions on future trading, transaction costs, other elements of the model, the strategy, the mix of business and other items that are likely to result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, are likely to result in adverse results relative to those modeled. The parameters and assumptions shall be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model shall be modified to reflect them at either anticipated experience or adverse estimates of the parameters.

2. A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets are subject to material discontinuities. This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the fixed indexed annuity and other in-scope products account balances reach a predetermined level in relationship to the guarantees. Any hedging strategy, including a delta hedging strategy, can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the stochastic reserve SR, the company must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

Commented [X544]: Reinstated this disclosure item, which is a rough reasonability check for regulator review/information on the modeled hedge benefit and call prompt further discussion

Commented [VM22545R544]: Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

Commented [CD546]: Not sure why this section is being deleted. Perhaps references to CDHS could be deleted, but otherwise this section still seems applicable

Commented [VM22547R546]: Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point

Commented [X548]: Suggest replacing "indexed" with "fixed" since this would apply to all fixed annuities

Commented [VM22549R548]: Edits to address this comment will be reflected in next exposure

Commented [X550]: Editorial change of "variable fixed indexed annuity" to be "fixed indexed annuity and other in-scope products"

Commented [VM22551R550]: Edits to address this comment will be reflected in next exposure

Commented [X552]: Recommend deleting "including a delta hedging strategy" as it is already covered by "any hedging strategy" and it is not clear if delta hedging strategy is the most common strategy in VM-22 hedging to be used as a general example

Commented [VM22553R552]: Edits to address this comment will be reflected in next exposure

3. A strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.
4. The combination of elements of the stochastic cash-flow model—including the initial actual market asset prices, prices for trading at future dates, transaction costs and other assumptions—should be analyzed by the company as to whether the stochastic cash-flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:
  - a. Hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money.
  - b. Hedging strategies that, with a given amount of initial money, never make less than accumulation at the one-period risk-free rates in any scenario but make more than this in one or more scenarios.
5. If the stochastic cash-flow model allows for such situations, the company should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the ~~stochastic reserve~~ SR otherwise calculated.
6. In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.
7. The company may also consider historical experience for similar current or past hedging programs on similar products to support the error factor determined for the projection.

Section 10: Guidance and Requirements for Setting Contract Holder Behavior Prudent Estimate Assumptions

A. General

Contract holder behavior assumptions encompass actions such as lapses, withdrawals, transfers, recurring deposits, benefit utilization, option election, etc. Contract holder behavior is difficult to predict accurately, and variance in behavior assumptions can significantly affect the ~~results~~ reserves level. In the absence of relevant and fully credible empirical data, the company should set behavior assumptions as guided by Principle 3 in Section 1.B and Section 12.

In setting behavior assumptions, the company should examine, but not be limited by, the following considerations:

1. Behavior can vary by product, market, distribution channel, index performance, interest credited (current and guaranteed rates), time/product duration, etc.
2. Options embedded in the product may affect behavior.
3. Utilization of options may be elective or non-elective in nature. Living benefits often are elective, and death benefit options are generally non-elective.
4. Elective contract holder options may be more driven by economic conditions than non-elective options.
5. As the value of a product option increases, there is an increased likelihood that contract holders will behave in a manner that maximizes their financial interest (e.g., lower lapses, higher benefit utilization, etc.).
6. Behavior formulas may have both rational and irrational components (irrational behavior is defined as situations where some contract holders may not always act in their best financial interest). The rational component should be dynamic, but the concept of rationality need not be interpreted in strict financial terms and might change over time in response to observed trends in contract holder behavior based on increased or decreased financial efficiency in exercising their contractual options.
7. ~~Options~~ that are ancillary to the primary product features ~~may or may not~~ be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many ~~thing~~ considerations, such as:
  - a. ~~For what~~ The purpose for which was the product purchased.<sup>2</sup>
  - b. ~~Is~~ Whether the is option elective or non-elective.<sup>2</sup>
  - c. ~~Whether~~ Is the value of the option is well-known.<sup>2</sup>
8. ~~External influences may affect behavior.~~

B. Aggregate vs. Individual Margins

1. Prudent estimate assumptions are developed by applying a margin for uncertainty to the anticipated experience assumption. The issue of whether the level of the margin applied to the anticipated experience assumption is determined in aggregate or independently for each and every behavior assumption is discussed in Principle 3 in Section 1.B.

Commented [X554]: Editorial clarification

Commented [VM22555R554]: Edits to address this comment will be reflected in next exposure

Commented [X556]: Need general assumption setting section, see APF 2021-11.

Commented [VM22557R556]: Edits to address this comment will be reflected in next exposure

Commented [X558]: We would suggest rewording this section to be considerations rather than posed as questions.

Commented [VM22559R558]: Edits to address this comment will be reflected in next exposure

Commented [X560]: Editorial clarification

Commented [VM22561R560]: Edits to address this comment will be reflected in next exposure

Commented [X562]: Recommend adding some examples here if this is included.

Commented [VM22563R562]: Edits to address this comment will be reflected in next exposure



2. Although this principle discusses the concept of determining the level of margins in aggregate, it notes that the application of this concept shall be guided by evolving practice and expanding knowledge. From a practical standpoint, it may not always be possible to completely apply this concept to determine the level of margins in aggregate for all behavior assumptions.
3. Therefore, the company shall determine prudent estimate assumptions independently for each behavior (e.g., mortality, lapses and benefit utilization), using the requirements and guidance in this section and throughout these requirements, unless the company can demonstrate that an appropriate method was used to determine the level of margin in aggregate for two or more material behavior assumptions, if relevant to the risks in the product, and thus the approach will not understate the reserve.

C. Sensitivity Testing

The impact of behavior can vary by product, time period, etc. For any assumption that is not prescribed or stochastically modeled, the company/qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing to ensure that the assumption is set at the conservative end of the plausible range. The company shall sensitivity test:

- Surrenders.
- Partial withdrawals.
- Benefit utilization.
- Account transfers.
- Future deposits.
- Other behavior assumptions if relevant to the risks in the product.

Sensitivity testing of assumptions is required and shall be more complex than, for example, base lapse assumption plus or minus X% across all contracts. A more appropriate sensitivity test in this example might be to devise parameters in a dynamic lapse formula to reflect more out-of-the-money contracts lapsing and/or more holders of in-the-money contracts persisting and eventually using the guarantee. The company should apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the company shall use higher margins when the underlying experience is less than fully relevant and credible.

The company shall examine the results of sensitivity testing to understand the materiality of prudent estimate assumptions on the modeled reserve. The company shall update the sensitivity tests periodically as appropriate, considering the materiality of the results of the tests. The company may update the tests less frequently (but no less than every 3 years) when the tests show less sensitivity of the modeled reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company may perform sensitivity testing:

1. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.

Commented [X564]: Clarification

Commented [VM22565R564]: Edits to address this comment will be reflected in next exposure

Commented [X566]: Suggest updating bullet to "Other material behavior assumptions if relevant to the risks in the product."

Commented [VM22567R566]: Edits to address this comment will be reflected in next exposure

Commented [X568]: Sensitivity testing is covered by the submitted APF 2021-11 for VM-21, and we should be consistent. VM-21 is currently lacking on sensitivity testing

Commented [VM22569R568]: Make edits to be consistent with VM-21 APFs prior to adoption of VM-22

Commented [VM22570R568]: Edits to address this comment will be reflected in next exposure

Commented [CD571]: why assign this specifically to the QA rather than leaving it as the responsibility of "the company", like we do elsewhere in the requirements?

Commented [VM22572R571]: Edits to address this comment will be reflected in next exposure

Commented [X573]: include for completion

Commented [VM22574R573]: Edits to address this comment will be reflected in next exposure

Commented [X575]: Consistent with APF 2021-11.

Commented [VM22576R575]: Edits to address this comment will be reflected in next exposure

2. Using data from prior periods.

D. Specific Considerations and Requirements

1. Within materiality considerations, the company should consider all relevant forms of contract holder behavior and persistency, including, but not limited to, the following:
  - a. Mortality (additional guidance and requirements regarding mortality is contained in Section 11).
  - b. Surrenders.
  - c. Partial withdrawals (systematic and elective).
  - d. Account transfers (switching/exchanges).
  - e. Resets/ratchets of the guaranteed amounts (automatic and elective).
  - f. Future deposits.
  - g. Income start date for the benefit utilization.
  - h. Commutation of benefit (from periodic payment to lump sum) or vice versa.

2. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the calculated provisions.

For example:

- a. The impact of account transfers (intra-contract index “switching”) might be ignored, unless required under the terms of the contract (e.g., automatic ~~asset~~ re-allocation/rebalancing, ) or if the contract provisions incentivize the contract holders to transfer between accounts.
- b. Future deposits might be excluded from the model, unless required by the terms of the contracts under consideration and then only in such cases where future premiums can reasonably be anticipated (e.g., with respect to timing and amount).
- c. For some non-elective benefits (nursing home benefits for example), a zero incidence rate after the surrender charge has ended, or the cash value has depleted, may be acceptable since use of a non-zero rate could reduce the modeled reserve.

~~Guidance Note: For some non elective benefits (nursing home benefits for example), unless relevant company experience exists to the contrary, the use of incidence rates greater than zero after the surrender charge has ended, or the cash value was depleted might be inappropriate may not be prudent since it would reduce the modeled reserve.~~

3. However, the company should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to test the impact of a shifting asset mix and/or consider future deposits to the extent they can reasonably be anticipated and increase the calculated amounts.

Commented [X577]: Clarification

Commented [VM22578R577]: Edits to address this comment will be reflected in next exposure

Commented [X579]: clarification

Commented [VM22580R579]: Edits to address this comment will be reflected in next exposure

Commented [CD581]: delete this word

Commented [VM22582R581]: Edits to address this comment will be reflected in next exposure

Commented [X583]: Reviewing, this guidance note does not exist in the 2019, 2020, 2021, or 2022 versions of VM-21. Where is this from? Should this be added to VM-21?

4. Normally, the underlying model assumptions would differ according to the attributes of the contract being valued. This would typically mean that contract holder behavior and persistency may be expected to vary according to such characteristics as (this is not an exhaustive list):
  - a. Gender.
  - b. Attained age.
  - c. Issue age.
  - d. Contract duration.
  - e. Time to maturity.
  - f. Tax status.
  - g. Account value.
  - h. Interest credited (current and guaranteed).
  - i. Available indices.
  - j. Guaranteed benefit amounts.
  - k. Surrender charges, transaction fees or other contract charges.
  - l. Distribution channel.
5. Unless there is clear evidence to the contrary, behavior assumptions should be no less conservative than past experience. Margins for contract holder behavior assumptions shall assume, without relevant and credible experience or clear evidence to the contrary, that contract holders' efficiency will increase over time.
6. In determining contract holder behavior assumptions, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience), whether or not the segment is directly written by the company. If data from a similar business segment are used, the assumption shall be adjusted to reflect differences between the two segments. Margins shall reflect the data uncertainty associated with using data from a similar but not identical business segment.
7. Where relevant and fully credible empirical data do not exist for a given contract holder behavior assumption, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is shifted towards the conservative end of the plausible range of expected experience that serves to increase the stochastic reserve. SR. If there are no relevant data, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is at the conservative end of the range. Such adjustments shall be consistent with the definition of prudent estimate, with the principles described in Section 1.B, and with the guidance and requirements in this section.
8. Ideally, contract holder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. It is important to note, however, that contract holder behavior should neither assume that all contract holders act with 100%

**Commented [X584]:** This also applies to VM-21, as there are fixed accounts. Is there any reason not to be consistent?

**Commented [VM22585R584]:** Only to focus on VM-22 for now

**Commented [X586]:** This is not a synonym (perhaps transfer fees is a subset of transaction fees) - why would transaction fees apply for VM-21, but only transfer fees for VM-22?

**Commented [VM22587R586]:** Edits to address this comment will be reflected in next exposure

**Commented [X588]:** This section states that "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally." This text seems to directly contradict Section II. Reserve Requirements 6.H.2 which states "When advantageous, policyholders will commence living benefit payouts if not started yet.". We suggest revising 6.H.2 to align with the text of 10.D.8.

efficiency in a financially rational manner nor assume that contract holders will always act irrationally. These extreme assumptions may be used for modeling efficiency if the result is more conservative.

E. Dynamic Assumptions

1. Consistent with the concept of prudent estimate assumptions described earlier, the liability model should incorporate margins for uncertainty for all risk factors that are not dynamic (i.e., the non-scenario tested assumptions) and are assumed not to vary according to the financial interest of the contract holder stochastically modeled.
2. The company should exercise care in using static assumptions when it would be more natural and reasonable appropriate to use a dynamic model or other scenario-dependent formulation for behavior. With due regard to considerations of materiality and practicality allowance for appropriate simplifications, approximations and modeling efficiency techniques, the use of dynamic models is encouraged, but not mandatory. Static assumptions Risk factors that are not scenario tested but could reasonably be expected to vary according to a stochastic process, or future states of the world (especially in response to economic drivers), may require higher margins and/or signal a need for higher margins for certain other assumptions.
3. Risk factors that are modeled dynamically should encompass the plausible range of behavior consistent with the economic scenarios and other variables in the model, including the non-scenario tested assumptions. The company shall test the sensitivity of results to understand the materiality of making alternate assumptions and follow the guidance discussed above on setting assumptions for sensitive behaviors.

F. Consistency with the CTE Level

1. All behaviors (i.e., dynamic, formulaic and non-scenario tested) should be consistent with the scenarios used in the CTE calculations (generally, the top 30% of the loss distribution). To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the company should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use prudent estimate assumptions for behavior that are reasonable and appropriate in such scenarios. For non-variable fixed annuities, these "valuation" scenarios would typically display one or more of the following attributes:
  - a. Declining, increasing and/or volatile index values, where applicable.
  - b. Price gaps and/or liquidity constraints.
  - c. Rapidly changing Volatile interest rates or persistently low interest rates.
  - d. Volatile credit spreads.
2. The behavior assumptions should be logical and consistent both individually and in aggregate, especially in the scenarios that govern the results. In other words, the company should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:

Commented [X589]: Recommend replacing "dynamic" with "stochastic." Risk factors with dynamic assumptions still need margins (although for an assumption that was part fixed and part dynamic, only one piece may have the margin but still the risk factor would have a margin).

Commented [VM22590R589]: Edits to address this comment will be reflected in next exposure

Commented [X591]: Suggest replacing "Risk factors that are not scenario tested but" with "Static assumptions that" to improve clarity in the wording.

Commented [VM22592R591]: Edits to address this comment will be reflected in next exposure

Commented [X593]: Get rid of some of the vague adjectives and be consistent with VM framework for simplifications.

Commented [VM22594R593]: Edits to address this comment will be reflected in next exposure

Commented [CD595]: "non-variable"?

Commented [VM22596R595]: Edits to address this comment will be reflected in next exposure

Commented [X597]: Editorial clarification to cover scenarios for all products/guarantees in scope

Commented [VM22598R597]: Edits to address this comment will be reflected in next exposure

Commented [X599]: Editorial for consistency with (a) above

Commented [VM22600R599]: Edits to address this comment will be reflected in next exposure

Commented [X601]: Suggesting deleting as we are not aware of dynamic credit spreads typically being modeled.

Commented [VM22602R601]: Edits to address this comment will be reflected in next exposure

- a. Remain logically and internally consistent across the scenarios tested.
  - b. Represent plausible outcomes.
  - c. Lead to appropriate, but not excessive, asset requirements.
4. The company should remember that the continuum of “plausibility” should not be confined or constrained to the outcomes and events exhibited by historic experience.
5. Companies should attempt to track experience for all assumptions that materially affect their risk profiles by collecting and maintaining the data required to conduct credible and meaningful studies of contract holder behavior.
- G. Additional Considerations and Requirements for Assumptions Applicable to Guaranteed Living Benefits

Experience for contracts without guaranteed living benefits may be of limited use in setting a lapse assumption for contracts with in-the-money or at-the-money guaranteed living benefits. Such experience may only be used if it is appropriate (e.g., lapse experience on contracts without a living benefit may have relevance to the early durations of contracts with living benefits) and relevant to the business.

H. Policy Loans

If policy loans are applicable for the block of business, the company shall determine cash flows for each projection interval for policy loan assets by modeling existing loan balances either explicitly or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

1. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution:
  - a. Produces reserves that are no less than those that would be produced by modeling existing loan balances explicitly.
  - b. Complies with the contract holder behavior requirements stated in Section 10.A to Section 10.G above in this section.
2. If the company models policy loans explicitly, the company shall:
  - a. Treat policy loan activity as an aspect of contract holder behavior and subject to the requirements above in this section.
  - b. Assign loan balances either to exactly match each policy's contract's utilization or to reflect average utilization over a model segment or sub-segments if the results are materially similar.
  - c. Model policy loan interest in a manner consistent with policy contract provisions and with the scenario. Include interest paid in cash as a positive policy loan cash flow in that projection interval, but do not include interest added to the loan balance as a policy loan cash flow. (The increased balance will require increased repayment cash flows in future projection intervals.)

Commented [CD603]: Okay to keep the term "Policy Loans"

Commented [VM22604R603]: Edits to address this comment will be reflected in next exposure

Commented [X605]: Clarify reference to be more specific.

Commented [VM22606R605]: Edits to address this comment will be reflected in next exposure

Commented [X607]: Editorial - VM-22 should consistently use contracts

Commented [VM22608R607]: Edits to address this comment will be reflected in next exposure

Commented [CD609]: "contract's"

Commented [VM22610R609]: Edits to address this comment will be reflected in next exposure

Commented [X611]: We have concern that reflecting average utilization may have material impact on benefit projections. Recommend adding "if the results are materially similar". This change is also applied to VM-20 and added to VM-21.

Commented [VM22612R611]: Edits to address this comment will be reflected in next exposure

Commented [X613]: Editorial - VM-22 should consistently use contracts

Commented [VM22614R613]: Edits to address this comment will be reflected in next exposure

Commented [CD615]: "contract"

Commented [VM22616R615]: Edits to address this comment will be reflected in next exposure

- d. Model policy loan principal repayments, including those that occur automatically upon death or surrender. Include policy loan principal repayments as a positive policy loan cash flow, per Section 4.A.1.h.
- e. Model ~~additional~~ policy loan principal. Include additional policy loan principal as a negative policy loan cash flow, per Section 4.A.1.h (but do not include interest added to the loan balance as a negative policy loan cash flow).
- f. Model any investment expenses allocated to policy loans and include them either with negative policy loan cash flows or insurance expense cash flows.

I. Non-Guaranteed Elements

Consistent with the definition in VM-01, Non-Guaranteed Elements (NGEs) are elements within a contract that affect ~~policy contract~~ costs or values and are not guaranteed or not determined at issue. NGEs consist of elements affecting contract holder costs or values that are both established and subject to change at the discretion of the insurer.

Examples of NGEs specific to non-variable~~fixed~~ annuities include but are not limited to the following: ~~fixed~~ the credited rates on fixed accounts, index parameters (caps, spreads, participation rates, etc.), rider fees, rider benefit features being subject to change (rollup rates, rollup period, etc.), account value charges, and dividends under participating policies or contracts.

1. Except as noted below in Section ~~10.4.5~~, the company shall include NGE in the models to project future cash flows beyond the time the company has authorized their payment or crediting.
2. The projected NGE shall reflect factors that include, but are not limited to, the following (not all of these factors will necessarily be present in all situations):
  - a. The nature of contractual guarantees.
  - b. The company's past NGE practices and established NGE policies.
  - c. The timing of any change in NGE relative to the date of recognition of a change in experience.
  - d. The benefits and risks to the company of continuing to authorize NGE.
3. Projected NGE shall be established based on projected experience consistent with how actual NGE are determined.
4. Projected levels of NGE in the cash-flow model must be consistent with the experience assumptions used in each scenario. Contract holder behavior assumptions in the model must be consistent with the NGE assumed in the model.
5. The company may exclude any portion of an NGE that:
  - a. Is not based on some aspect of the ~~policy's or~~ contract's experience.
  - b. Is authorized by the board of directors and documented in the board minutes, where the documentation includes the amount of the NGE that arises from other sources.

However, if the board has guaranteed a portion of the NGE into the future, the company must model that amount. In other words, the company cannot exclude

**Commented [CD617]:** The wording of "additional" is unclear. Does this mean maintaining a certain level of policy loan utilization throughout the projection (i.e., adding principal as repayments are made), or actually increasing policy loan utilization (i.e., adding more principal) over time? The former would seem more appropriate than the latter.

**Commented [VM22618R617]:** Edits to address this comment will be reflected in next exposure

**Commented [X619]:** Clarification

**Commented [VM22620R619]:** Edits to address this comment will be reflected in next exposure

**Commented [CD621]:** suggest: "contract holder"

**Commented [VM22622R621]:** Edits to address this comment will be reflected in next exposure

**Commented [X623]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22624R623]:** Edits to address this comment will be reflected in next exposure

**Commented [CD625]:** suggest: "are not"

**Commented [VM22626R625]:** Edits to address this comment will be reflected in next exposure

**Commented [CD627]:** suggest: "non-variable annuities"

**Commented [VM22628R627]:** Edits to address this comment will be reflected in next exposure

**Commented [X629]:** Clarity

**Commented [VM22630R629]:** Edits to address this comment will be reflected in next exposure

**Commented [X631]:** Correct section reference

**Commented [VM22632R631]:** Edits to address this comment will be reflected in next exposure

**Commented [CD633]:** delete "policy's or"

**Commented [VM22634R633]:** Edits to address this comment will be reflected in next exposure

**Commented [X635]:** Why does being authorized mean it can be excluded? This seems backwards. Does this mean it has already transpired?

from its model any NGE that the board has guaranteed for future years, even if it could have otherwise excluded them, based on this subsection.

6. The liability for contract holder dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date is reported separately from the statutory reserve. The contract holder dividends that give rise to this dividend liability as of the valuation date may or may not be included in the cash-flow model at the company's option.
  - a. If the contract holder dividends that give rise to the dividend liability are not included in the cash-flow model, then no adjustment is needed to the resulting ~~aggregate stochastic reserve~~ SR.
  - b. If the contract holder dividends that give rise to the dividend liability are included in the cash-flow model, then the resulting ~~aggregate stochastic reserve~~ SR should be reduced by the amount of the dividend liability.
7. All projected cash flows associated with NGEs shall reflect margins for adverse deviations and estimation error in prudent estimate assumptions.

Commented [CD636]: delete "aggregate"

Commented [VM22637R636]: Edits to address this comment will be reflected in next exposure

Commented [CD638]: delete "aggregate"

Commented [VM22639R638]: Edits to address this comment will be reflected in next exposure

Section 11: Guidance and Requirements for Setting Prudent Estimate Mortality Assumptions

A. Overview

1. Intent

The guidance and requirements in this section apply to setting prudent estimate mortality assumptions when determining the stochastic reserve. SR. The intent is for prudent estimate mortality assumptions to be based on facts, circumstances and appropriate actuarial practice, with only a limited role for unsupported actuarial judgment. (Where more than one approach to appropriate actuarial practice exists, the company should select the practice that the company deems most appropriate under the circumstances.)

2. Description

Prudent estimate mortality assumptions shall be determined by first developing expected mortality curves based on either available experience or published tables. Where necessary, margins shall be applied to the experience to reflect data uncertainty. The expected mortality curves shall then be adjusted based on the credibility of the experience used to determine the expected mortality curve. Section 11.B addresses guidance and requirements for determining expected mortality curves, and Section 11.C addresses guidance and requirements for adjusting the expected mortality curves to determine prudent estimate mortality.

Finally, the credibility-adjusted tables shall be adjusted for mortality improvement (where such adjustment is permitted or required) using the guidance and requirements in Section 11.D.

3. Business Segments

For purposes of setting prudent estimate mortality assumptions, the products falling under the scope of these requirements shall be grouped into business segments with different mortality assumptions. The grouping, at a minimum, should differentiate between payout annuities or deferred annuity contracts that contain GLBs, and deferred annuity contracts with no guaranteed benefits or only GMDBs. Where appropriate, the grouping should also differentiate between segments which are known or expected to contain contract holders with sociodemographic, geographic, or health factors reasonably expected to impact the mortality assumptions for the segment (e.g., annuitants drawn from different countries, geographic areas, industry groups, or impaired lives on individually underwritten contracts such as structured settlements). The grouping should also generally follow the pricing, marketing, management and/or reinsurance programs of the company.

**Guidance Note:** This paragraph contemplates situations where it may be appropriate to differentiate mortality assumptions by segment or even by contract due to varying sociodemographic, geographic, or health factors. Particularly, though not exclusively, in the context of group payout annuity contracts, companies may have credible, contract-specific mortality experience data or relevant pooled data from annuitants drawn from similar industries or geographies that may be used to sub-divide inforce blocks into business segments for purposes of setting prudent estimate mortality assumptions.

For example, a company may sell group PRT contracts both to union plans in the U.S. and to private single-employer plans in another country. While both are “PRT contracts,” it would be appropriate to differentiate them for mortality assumption purposes, similar to

**Commented [X640]:** Specific requirements will require further discussion, particularly what if any industry experience is identified for the SPA. Ideally, updated and appropriate assumptions should be used for better alignment and to avoid any false positives flagged as an outlier by the SPA.

**Commented [VM22641R640]:** Will address SPA separately

**Commented [X642]:** Recommend removing reference to actuarial judgment being “unsupported” from VM-21 and VM-22 because actuarial judgment should always be supportable - it is “judgment” not an arbitrary decision.



how payout annuities vs. deferred annuities are distinguished.

**Guidance Note:** Distinct mortality or liability assumptions among different contracts within a group of contracts does not in itself preclude the group of contracts from being aggregated for the purposes of the broader stochastic reserve calculation.

4. Margin for Data Uncertainty

The expected mortality curves that are determined in Section 11.B may need to include a margin for data uncertainty. The margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the provision for uncertainty to mortality. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment.

For purposes of this section, if mortality must be increased (decreased) to provide for uncertainty, the business segment is referred to as a ~~plus (minus)~~ mortality (longevity) segment.

It may be necessary, because of a change in the mortality risk profile of the segment, to reclassify a business segment from a ~~mortality (longevity) plus (minus)~~ segment to a ~~longevity (mortality) minus (plus)~~ segment to the extent compliance with this section requires such a reclassification. For example, a segment could require reclassification depending on whether it is gross or net of reinsurance.

B. Determination of Expected Mortality Curves

1. Experience Data

In determining expected mortality curves, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience). See Section 11.B.2 for additional considerations. Finally, if there is no data, the company shall use the applicable table, as required in Section 11.B.3.

2. Data Other Than Direct Experience

Adjustments shall be applied to the data to reflect differences between the business segments, and margins shall be applied to the adjusted expected mortality curves to reflect the data uncertainty associated with using data from a similar but not identical business segment.

To the extent the mortality of a business segment is reinsured, any mortality charges that are consistent with the company's own pricing and applicable to a substantial portion of the mortality risk also may be a reasonable starting point for the determination of the company's expected mortality curves.

3. No Data Requirements

**Commented [X643]:** Recommend deleting this guidance note since it is unnecessary - there is no such restriction for any of VM-20, VM-21 or VM-22. It would be an absurd level of granular distinction, such that it is not clear you could actually perform the projection, given that assumptions vary by attained age, etc.

**Commented [VM22644R643]:** Edits to address this comment will be reflected in next exposure

**Commented [X645]:** Terming the segments "mortality (longevity) segments" would be easier to understand than "plus (minus) segments".

**Commented [VM22646R645]:** Edits to address this comment will be reflected in next exposure

**Commented [X647]:** It is unclear how to interpretate the statement and how to review it for both VM-21 and VM-22. If a company reinsures GMWMB riders, then does it mean that on a net basis the segment would no longer be considered as minus? So, there would be distinct designations for the pre and post reinsurance runs? Recommend discussing the statement and adding additional language or a guidance note to make it clear.

**Commented [X648]:** Delete period, it is a typo

**Commented [VM22649R648]:** Edits to address this comment will be reflected in next exposure

**Commented [X650]:** Does this need to be edited to be consistent with "little or no" data?

- i. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no less than:

[2021 SOA Deferred Annuity Mortality Table] with [Projection Scale G2] for individual deferred annuities that do not contain guaranteed living benefits

$$q_x^{20XX+n} = q_x^{20XX}(1 - G2_x)^n$$

- ii. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no greater than:

- a. [The appropriate percentage ( $F_x$ ) from Table 11.1 applied to the 2012 IAM Basic Mortality Table] with [Projection Scale G2] for individual payout annuity contracts and deferred annuity contracts with guaranteed living benefits

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n * F_x$$

- b. [1983 Table "a"] for structured settlements or other contracts with impaired mortality

- c. [1994 GAR Table] with [Projection Scale AA] for group annuities

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

Table 11.1

Attained Age (x)	$F_x$
<=65	80.0%
66	81.5%
67	83.0%
68	84.5%
69	86.0%
70	87.5%
71	89.0%
72	90.5%
73	92.0%
74	93.5%
75	95.0%
76	96.5%
77	98.0%
78	99.5%
79	101.0%
80	102.5%
81	104.0%

Commented [X651]: Section 11.B.3.i only has one item "a". There is no need to specifically have a single item "a". Recommend delete the notation "a" and have "Section 11.B.3.i" only.

Commented [VM22652R651]: Will be updated upon SPA assumption development

Commented [X653]: For PRT an assumption based on third-party data provider would be better than the industry table to get contract specific mortality assumptions. Is this permitted? The guidance note in A.3 seems to get at this but it's not clear in B.3.i.c whether this is allowed. This is an important distinction as PRT population can vary from those populations the tables are based upon.

Commented [VM22654R653]: Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

Commented [X655]: The 1983 Table "a" and 1994 GAR are used for structured settlements and group annuities, respectively. These tables seem to be out of date. If Standard Projected Amount work develops more granular and up to date tables, should these tables be updated to use consistent tables?

Commented [VM22656R655]: Will be updated upon SPA assumption development

Commented [X657]: The percentage factors ( $F_x$ ) are over 100% from attained age 79 to age 104. Is it appropriate to set the factors above 100% for the older ages with no credibility?

Commented [VM22658R657]: Will be updated upon SPA assumption development

Commented [CD659]: does the  $F_x$  factor need any consideration for FIAs with GLBs?

Commented [VM22660R659]: Will be updated upon SPA assumption development

82	105.5%	
83	107.0%	
84	108.5%	
85	110.0%	
86	110.0%	
87	110.0%	
88	110.0%	
89	110.0%	
90	110.0%	
91	110.0%	
92	110.0%	
93	110.0%	
94	110.0%	
95	110.0%	
96	109.0%	
97	108.0%	
98	107.0%	
99	106.0%	
100	105.0%	
101	104.0%	
102	103.0%	
103	102.0%	
104	101.0%	
>=105	100.0%	

iii. For a business segment with non-U.S. insureds, when little or no experience or information is available on a business segment, an established industry or national mortality table and mortality improvement scale may be used, with approval from the domiciliary commissioner.

4. Additional Considerations Involving Data

The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., direct data discussed in Section 11.B.1 or other than direct data discussed in Section 11.B.2).

a. Underreporting of Deaths

Mortality data shall be examined for possible underreporting of deaths. Adjustments shall be made to the data if there is any evidence of underreporting. Alternatively, exposure by lives or amounts on contracts for which death benefits were in the money may be used to determine expected mortality curves. Underreporting on such exposures should be minimal; however, this reduced subset of data will have less credibility.

b. Experience by Contract Duration

Experience of a plus segment shall be examined to determine if mortality by contract duration increases materially due to selection at issue. In the absence of information, the company shall assume that expected mortality will increase by

Commented [X661]: The phrase "When little or no experience or information is available on a business segment" is not included, unlike in (i) and (ii) of the same sub-section. It appears to be the intent that this is the only situation in which this would apply, but it would be helpful to make this explicit.

Commented [VM22662R661]: Edits to address this comment will be reflected in next exposure

Commented [X663]: Reference to the MI scale missing for international business

Commented [VM22664R663]: Edits to address this comment will be reflected in next exposure

contract duration for an appropriate select period. As an alternative, if the company determines that mortality is affected by selection, the company could apply margins to the expected mortality in such a way that the actual mortality modeled does not depend on contract duration.

c. Modification and Relevance of Data

Even for a large company, the quantity of life exposures and deaths are such that a significant amount of smoothing may be required to determine expected mortality curves from mortality experience. Expected mortality curves, when applied to the recent historic exposures (e.g., three to seven years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments.

In determining expected mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine expected mortality curves should be documented.

d. Other Considerations

In determining expected mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

C. Adjustment for Credibility to Determine Prudent Estimate Mortality

1. Adjustment for Credibility

The expected mortality curves determined in Section 11.B shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at prudent estimate mortality. The adjustment for credibility shall result in blending the expected mortality curves including margins for uncertainty with the mortality assumption assumptions described in Section 11.B.3. The approach used to adjust the curves shall suitably account for credibility.

**Guidance Note:** For example, when credibility is zero, an appropriate approach should result in a mortality assumption consistent with 100% of the industry mortality assumption described in Section 11.B.3 table used in the blending.

2. Adjustment of Statutory Valuation Industry Mortality for Improvement

For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be and the industry mortality table for a minus segment must be adjusted for mortality improvement. Such adjustment shall reflect the mortality improvement scale described in Section 11.B.3 from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the expected mortality curves.

3. Credibility Procedure

The credibility procedure used shall:

a. Produce results that are reasonable.

**Commented [X665]:** Both plan and industry data should get weighted for business such as PRT. This text says to blend with prescribed tables, but that might not make sense unless additional experience data was unavailable.

**Commented [VM22666R665]:** Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

**Commented [X667]:** Clarification

**Commented [VM22668R667]:** Edits to address this comment will be reflected in next exposure

**Commented [X669]:** Editorial

**Commented [VM22670R669]:** Edits to address this comment will be reflected in next exposure

**Commented [X671]:** The “statutory valuation” is struck out in the guidance note. Recommend replacing “statutory valuation” with either “reference of Section 11.B.3” or “industry”. Otherwise, it is a vague reference since we have both a company mortality table and an industry mortality table.

**Commented [VM22672R671]:** Edits to address this comment will be reflected in next exposure

**Commented [CD673]:** need to reference “the mortality assumption described in Section 11.B.3” here? Otherwise, the sentence is unclear.

**Commented [VM22674R673]:** Edits to address this comment will be reflected in next exposure

**Commented [X675]:** Mortality improvement should be consistent with the underlying tables used, so we would suggest this being based on available experience subject to appropriate guardrails.

**Commented [X676]:** “Statutory Valuation” was stricken from all the body, but left in this title. Consider replacing with “industry”.

**Commented [VM22677R676]:** Edits to address this comment will be reflected in next exposure

**Commented [CD678]:** for consistency, need to delete this reference to “Statutory Valuation”

**Commented [VM22679R678]:** Edits to address this comment will be reflected in next exposure

- b. Not tend to bias the results in any material way.
  - c. Be practical to implement.
  - d. Give consideration to the need to balance responsiveness and stability.
  - e. Take into account not only the level of aggregate claims but the shape of the mortality curve.
  - f. Contain criteria for full credibility and partial credibility that have a sound statistical basis and be appropriately applied.
4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement

The credibility-adjusted table used for plus segments may be and the credibility adjusted table used for minus segments must be adjusted for mortality improvement using the applicable mortality improvement scale described in Section 11.B.3 from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement beyond the valuation date is discussed in Section 11.D.

D. Future Mortality Improvement

The mortality assumption resulting from the requirements of Section 11.C shall be adjusted for mortality improvements beyond the valuation date if such an adjustment would serve to increase the resulting ~~stochastic reserve~~SR. If such an adjustment would reduce the ~~stochastic reserve~~SR, such assumptions are permitted, but not required. In either case, the assumption must be based on current relevant data with a margin for uncertainty (increasing assumed rates of improvement if that results in a higher reserve or reducing them otherwise).

Section 12: Other Guidance and Requirements for Assumptions

A. Overview

This section provides guidance and requirements in general for setting prudent estimate assumptions when determining either the SR or DR. It also provides specific guidance and requirements for expense assumptions.

B. General Assumption Requirements

1. The company shall use prudent estimate assumptions for risk factors that are not stochastically modeled by applying margins to the anticipated experience assumptions if such risk factors have been categorized as material risks by following Section 1.B Principle 3 and requirements in Section 12.C.
2. The company shall establish the prudent estimate assumptions for risk factors in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.
3. The company shall model the following risk factors stochastically unless the company elects the stochastic modeling exclusion defined in Section 7:
  - a. Interest rate movements (i.e., Treasury interest rate curves).
  - b. Equity performance (e.g., Standard & Poor's 500 index [S&P 500] returns and returns of other equity investments).
4. If the company elects to stochastically model risk factors in addition to the economic scenarios, the requirements in this section for determining prudent estimate assumptions for these risk factors do not apply.

**Guidance Note:** It is expected that companies will not stochastically model risk factors other than the economic scenarios, such as contract holder behavior or mortality, until VM-22 has more specific guidance and requirements available. Companies shall discuss with domiciliary regulators if they wish to stochastically model other risk factors.

5. The company shall use its own experience, if relevant and credible, to establish an anticipated experience assumption for any risk factor. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the anticipated experience assumption, making modifications as needed to reflect the circumstances of the company.
  - a. For risk factors (such as mortality) to which statistical credibility theory may be appropriately applied, the company shall establish anticipated experience assumptions for the risk factor by combining relevant company experience with industry experience data, tables or other applicable data in a manner that is consistent with credibility theory and accepted actuarial practice.

**Commented [X680]:** We believe discussion of allocation of appropriate reserves should be analyzed as part of the field study.

**Commented [VM22681R680]:** The VM-22 Subgroup has no objections to waiting until after the field study to determine the allocation approach.

**Commented [X682]:** Need to add a Section 12 for general guidance on prudent assumption setting and on expenses. For VM-21, APF 2021-11 is currently exposed. Should be consistent with that APF, after any tweaks are made. [https://content.naic.org/sites/default/files/inline-files/APF%2021-11%20VM21%20assumptions\\_012021.pdf](https://content.naic.org/sites/default/files/inline-files/APF%2021-11%20VM21%20assumptions_012021.pdf)

**Commented [VM22683R682]:** Subgroup agreed on adding this as a new Section 12.

- b. For risk factors (such as utilization of guaranteed living benefits) that do not lend themselves to the use of statistical credibility theory, and for risk factors (such as some of the lapse assumptions) to which statistical credibility theory can be appropriately applied but cannot currently be applied due to lack of industry data, the company shall establish anticipated experience assumptions in a manner that is consistent with accepted actuarial practice and that reflects any available relevant company experience, any available relevant industry experience, or any other experience data that are available and relevant. Such techniques include:
    - i. Adopting standard assumptions published by professional, industry or regulatory organizations to the extent they reflect any available relevant company experience or reasonable expectations.
    - ii. Applying factors to relevant industry experience tables or other relevant data to reflect any available relevant company experience and differences in expected experience from that underlying the base tables or data due to differences between the risk characteristics of the company experience and the risk characteristics of the experience underlying the base tables or data.
    - iii. Blending any available relevant company experience with any available relevant industry experience and/or other applicable data using weightings established in a manner that is consistent with accepted actuarial practice and that reflects the risk characteristics of the underlying contracts and/or company practices.
  - c. For risk factors that have limited or no experience or other applicable data to draw upon, the assumptions shall be established using sound actuarial judgment and the most relevant data available, if such data exists.
  - d. For any assumption that is set in accordance with the requirements of Section 12.B.5.c, the qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing and disclose the analysis performed to ensure that the assumption is set at the conservative end of the plausible range.
  - e. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of statistical or other testing indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary shall set a new, adequate, anticipated experience assumption for the factor.
6. The company shall sensitivity test risk factors that are not stochastically modeled and examine the impact on the stochastic reserve. The company shall update the sensitivity tests periodically as appropriate. The company may update the tests less frequently, but no less than every 3 years, when the tests show less sensitivity of the stochastic reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company

may perform sensitivity testing:

- a. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
- b. Using data from prior periods.

**Guidance Note:** Sensitivity testing every risk factor on an annual basis is not required. For some risk factors, it may be reasonable, in lieu of sensitivity testing, to employ statistical measures for margins, such as adding one or more standard deviations to the anticipated experience assumption.

7. The company shall vary the prudent estimate assumptions from scenario to scenario within the stochastic reserve calculation in an appropriate manner to reflect the scenario-dependent risks.

#### C. Assumption Margins

The company shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed, subject to the following:

1. The level of margin applied to the anticipated experience assumptions may be determined in aggregate or independently as discussed in Section 1.B Principle 3. It is not permissible to set a margin less toward the conservative end of the spectrum to recognize, in whole or in part, implicit or prescribed margins that are present, or are believed to be present, in other risk factors.

Risks that are stochastically modeled (e.g., interest rates, equity returns) or have prescribed margins or guardrails (e.g., assets, revenue sharing) shall be considered material risks. Other risks generally considered to be material include, but are not limited to, mortality, contract holder behavior, maintenance and overhead expenses, inflation and implied volatility. In some cases, the list of material risks may also include acquisition expenses, partial withdrawals, policy loans, annuitizations, account transfers and deposits, and/or option elections that contain an element of anti-selection.

2. The greater the uncertainty in the anticipated experience assumption, the larger the required margin, with the margin added or subtracted as needed to produce a larger Sr or DR than would otherwise result. For example, the company shall use a larger margin when:

- a. The experience data have less relevance or lower credibility.
- b. The experience data are of lower quality, such as incomplete, internally inconsistent or not current.
- c. There is doubt about the reliability of the anticipated experience assumption, such as, but not limited to, recent changes in circumstances or changes in company policies.
- d. There are constraints in the modeling that limit an effective reflection of the risk factor.

Commented [X684]: [Edit for VM-22 vs. VM-21?](#)

Commented [VM22685R684]: Will include this language in the next exposure and will solicit any comments



3. In complying with the sensitivity testing requirements in Section 12.B.6 above, greater analysis and more detailed justification are needed to determine the level of uncertainty when establishing margins for risk factors that produce greater sensitivity on the stochastic reserve.
4. A margin is permitted but not required for assumptions that do not represent material risks.
5. A margin should reflect the magnitude of fluctuations in historical experience of the company for the risk factor, as appropriate.
6. The company shall apply the method used to determine the margin consistently on each valuation date but is permitted to change the method from the prior year if the rationale for the change and the impact on the stochastic reserve is disclosed.

#### D. Expense Assumptions

##### 1. General Prudent Estimate Expense Assumption Requirements

In determining prudent estimate expense assumptions, the company:

- a. May spread certain information technology development costs and other capital expenditures over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles.

**Guidance Note:** Care should be taken with regard to the potential interaction with the inflation assumption below.

- b. Shall assume that the company is a going concern.
- c. Shall choose an appropriate expense basis that properly aligns the actual expense to the assumption. If values are not significant, they may be aggregated into a different base assumption.

**Guidance Note:** For example, death benefit expenses should be modeled with an expense assumption that is per death incurred.

- d. Shall reflect the impact of inflation.
- e. Shall not assume future expense improvements.
- f. Shall not include assumptions for federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) and foreign income taxes.
- g. Shall use assumptions that are consistent with other related assumptions.
- h. Shall use fully allocated expenses.

**Guidance Note:** Expense assumptions should reflect the direct costs associated with the block of contracts being modeled, as well as indirect costs and overhead costs that have been allocated to the modeled contracts.

- i. Shall allocate expenses using an allocation method that is consistent across

company lines of business. Such allocation must be determined in a manner that is within the range of actuarial practice and methodology and consistent with applicable ASOPs. Allocations may not be done for the purpose of decreasing the stochastic reserve.

- j. Shall reflect expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger in the expense assumption only when any future costs associated with achieving the efficiencies are also recognized.

**Guidance Note:** For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past, then there would be no future expenses to reflect in the valuation.

- k. Shall reflect the direct costs associated with the contracts being modeled, as well as an appropriate portion of indirect costs and overhead (i.e., expense assumptions representing fully allocated expenses should be used), including expenses categorized in the annual statement as “taxes, licenses and fees” (Exhibit 3 of the annual statement) in the expense assumption.

- l. Shall include acquisition expenses associated with business in force as of the valuation date and significant non-recurring expenses expected to be incurred after the valuation date in the expense assumption.

- m. For contracts sold under a new policy form or due to entry into a new product line, the company shall use expense factors that are consistent with the expense factors used to determine anticipated experience assumptions for contracts from an existing block of mature contracts taking into account:

- i. Any differences in the expected long-term expense levels between the block of new contacts and the block of mature contracts.

- ii. That all expenses must be fully allocated as required under Section 12.D.1.h above.

## 2. Margins for Prudent Estimate Expense Assumptions

The company shall determine margins for expense assumptions following Section 12.C.

Section 13: Allocation of Aggregate Reserves to the Contract Level

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve. For the purpose of this section, if a contract does not have a cash surrender value, then the cash surrender value is assumed to be zero.

Contracts for which the Deterministic Certification Option is elected in Section 7.E are intended to use the methodology described in this section to allocate aggregate reserves in excess of the cash surrender value to individual contracts.

The contract-level reserve for each contract shall be the sum of the following:

- A. The contract's cash surrender value.

Drafting Note: The American Academy of Actuaries Annuity Reserves and Capital Work Group is including two potential options for allocating the excess portion of the aggregate reserve over cash surrender value: (1) Use the same approach as VM-21 (2) Allocate based on an actuarial present value calculation.

The Work Group did not reach a consensus between these two approaches, so wording for both is included in the text below. The Work Group recommends field testing both approaches and considering the results in determining future decisions.

**Option 1: VM-21 Approach**

- B. An allocated portion of the excess of the aggregate reserve over the aggregate cash surrender value shall be allocated to each contract based on a measure of the risk of that product relative to its cash surrender value in the context of the company's in force contracts (assuming zero cash value for contracts that do not contain such). The allocation shall be made separately for DR and SR. The measure of risk should consider the impact of risk mitigation programs, including hedge programs and reinsurance, that would affect the risk of the product. The specific method of assessing that risk and how it contributes to the company's aggregate reserve shall be defined by the company. The method should provide for an equitable allocation based on risk analysis.

**Commented [X686]:** This method only makes sense if done separately for the DR and SR.

- 1. As an example, consider a company with the results of the following three contracts:

Table 12.1: Sample Allocation of Aggregate Reserve

Contract (i)	1	2	3	Total
Cash Surrender Value, C	28	40	52	120
Risk adjusted measure, R	38	52	50	
Aggregate Reserve				140
Allocation Basis for the excess of the Aggregate Reserve over the Cash Surrender Value $A_i = \text{Max}(R_i - C_i, 0)$	10	12	0	22

Allocation of the excess of the Aggregate Reserve over the Cash Surrender Value $Li = (Ai) \sum Ai * [Aggregate Reserve - \sum Ci]$	9.09	10.91	0.00	20
Contract-level reserve $Ci + Li$	37.09	50.91	52.00	140.00

2. In this example, the Aggregate Reserve exceeds the aggregate Cash Surrender Value by 20. The 20 is allocated proportionally across the three contracts based on the allocation basis of the larger of (i) zero; and (ii) a risk adjusted measure based on reserve principles. Therefore, contracts 1 and 2 receive 45% (9/22) and 55% (11/22), respectively, of the excess Aggregate Reserve. As Contract 3 presents no risk in excess of its cash surrender value, it does not receive an allocation of the excess Aggregate Reserve.

**Option 2: Actuarial Present Value Approach**

B. The excess of the aggregate reserve over the aggregate cash surrender value is allocated to policies based on a calculation of the actuarial present value of projected liability cash flows in excess of the cash surrender value:

1. Discount the liability cash flows at the NAER, pursuant to requirements in Section 4, for the scenario that produces the scenario reserve closest to, but not less than the stochastic reserve  $SR$  defined in Section 3.D.
  - a. Groups of contracts that elect the Deterministic Certification Option defined in Section 7.E shall use the NAER in the single scenario used to calculate the reserve to discount liability cash flows, as well as any cash flows that are scenario dependent.
2. If the actuarial present value is less than the cash surrender value, then the excess actuarial present value to be used for allocating the excess aggregate reserve over the cash value shall be floored at zero.
  - a. If all contracts have an excess actuarial present value that is floored at zero, then use the cash surrender value to allocate any excess aggregate reserve over the aggregate cash surrender value.
3. For projecting future liability cash flows, assume the same liability assumptions that were used to calculate the stochastic reserve  $SR$  defined in Section 3.D.
4. As a hypothetical example, consider a company with the results of the following five contracts:

**Commented [X687]:** This method depends on the NAER, so would not work for companies that use direct iteration.

**Commented [X688]:** This could give an unstable allocation if there is an even mix of products with different risk profiles, so that the tail is populated with some scenarios where Product A does poorly and some where Product B does poorly. The single scenario will only reflect the riskiness of one of the products.

**Commented [X689]:** Not just the NAER, but the cashflows are also scenario dependent.

**Commented [VM22690R689]:** Edits to address this comment will be reflected in next exposure

**Commented [CD691]:** "Section 3.D"

**Commented [VM22692R691]:** Edits to address this comment will be reflected in next exposure

Table 12.1: Hypothetical Sample Allocation of Aggregate Reserve

Contract	Example Product Type	CSV* (1)	Scenario APV (2)	Excess (Floored) of the scenario APV over CSV* (3) = $\text{Max}[(2)-(1), 0]$	Aggregate Reserve CTE 70 (4)	Excess of Aggregate Reserve over Aggregate CSV* (5) = $\text{Max}[(4 \text{ Total}) - (1 \text{ Total}), 0]$	Allocated Excess Reserve (6) = (3) x [(5 Total) / (3 Total)]	Total Contract Level Reserve (7) = (1) + (6)
Contract 1:	Indexed Annuity with no GLWB**	95.0	90.0	0.0			0.0	95.0
Contract 2:	Indexed Annuity with low benefit GLWB**	92.0	95.0	3.0			3.6	95.6
Contract 3:	Indexed Annuity with medium benefit GLWB**	90.0	100.0	10.0			12.0	102.0
Contract 4:	Indexed Annuity with high benefit GLWB**	88.0	105.0	17.0			20.4	108.4
Contract 5:	Fixed Life Contingent Payout Annuity	0.0	70.0	70.0			84.0	84.0
Total		365.0		100.0	485.0	120.0	120.0	485.0

\*Cash Surrender Value  
 \*\*Guaranteed Lifetime Withdrawal Benefit

**Guidance Note:** The actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

Commented [CD693]: should be " $\text{Max}[(2)-(1), 0]$ "

Commented [VM22694R693]: Edits to address this comment will be reflected in next exposure

Section 14: Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves

A. Purpose and Scope

1. These requirements define for single premium immediate annuity contracts and other similar contracts, certificates and contract features the statutory maximum valuation interest rate that complies with Model #820. These are the maximum interest rate assumption requirements to be used in the CARVM and for certain contracts, the CRVM. These requirements do not preclude the use of a lower valuation interest rate assumption by the company if such assumption produces statutory reserves at least as great as those calculated using the maximum rate defined herein.
2. The following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits arising from variable annuities, are covered in this section, and all contracts not passing the SET covered by Sections 1 through 13 of VM-22, are covered Section 14 of VM-22:
  - a. Immediate annuity contracts issued after Dec. 31, 2017;
  - b. Deferred income annuity contracts issued after Dec. 31, 2017;
  - c. Structured settlements in payout or deferred status issued after Dec. 31, 2017;
  - d. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued after Dec. 31, 2017;
  - e. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued during 2017, for fixed payouts commencing after Dec. 31, 2018, or, at the option of the company, for fixed payouts commencing after Dec. 31, 2017;
  - f. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest), issued after Dec. 31, 2017;
  - g. Fixed income payment streams, attributable to contingent deferred annuities (CDAs) issued after Dec. 31, 2017, once the underlying contract funds are exhausted;
  - h. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts issued after Dec. 31, 2017, once the contract funds are exhausted; and
  - i. Certificates with premium determination dates after Dec. 31, 2017, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders benefits upon their retirement.

**Guidance Note:** For Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f and Section 14.A.2.h above, there is no restriction on the type of contract that may give rise to the benefit.

3. Exemptions:
  - a. With the permission of the domiciliary commissioner, for the categories of annuity contracts, certificates and/or contract features in scope as outlined in Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f, Section 14.A.2.g or Section 14.A.2.h, the

**Commented [X695]:** Under A.2: need to exclude contracts being covered by the earlier sections of VM-22 not passing the exclusion tests and need a clearer reference instead of "covered in this section"

**Commented [VM22696R695]:** Edits to address this comment will be reflected in next exposure

company may use the same maximum valuation interest rate used to value the payment stream in accordance with the guidance applicable to the host contract. In order to obtain such permission, the company must demonstrate that its investment policy and practices are consistent with this approach.

4. The maximum valuation interest rates for the contracts, certificates and contract features within the scope of Section 13.14 of VM-22 supersede those described in Appendix VM-A and Appendix VM-C, but they do not otherwise change how those appendices are to be interpreted. In particular, *Actuarial Guideline IX-B—Clarification of Methods Under Standard Valuation Law for Individual Single Premium Immediate Annuities, Any Deferred Payments Associated Therewith, Some Deferred Annuities and Structured Settlements Contracts* (AG-9-B) (see VM-C) provides guidance on valuation interest rates and is, therefore, superseded by these requirements for contracts, certificates and contract features in scope. Likewise, any valuation interest rate references in *Actuarial Guideline IX-C—Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives Under Individual Single Premium Immediate Annuities* (AG-9-C) (see VM-C) are also superseded by these requirements.

#### B. Definitions

1. The term “reference period” means the length of time used in assigning the Valuation Rate Bucket for the purpose of determining the statutory maximum valuation interest rate and is determined as follows:
  - a. For contracts, certificates or contract features with life contingencies and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the earlier of: i) the date of the last non-life-contingent payment under the contract, certificate or contract feature; and ii) the date of the first life-contingent payment under the contract, certificate or contract feature, or
  - b. For contracts, certificates or contract features with no life-contingent payments and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the date of the last non-life-contingent payment under the contract, certificate or contract feature, or
  - c. For contracts, certificates or contract features where the payments are not substantially similar, the actuary should apply prudent judgment and select the Valuation Rate Bucket with Macaulay duration that is a best fit to the Macaulay duration of the payments in question.

**Guidance Note:** Contracts with installment refunds or similar features should consider the length of the installment period calculated from the premium determination date as the non-life contingent period for the purpose of determining the reference period.

**Guidance Note:** The determination in Section 13.14.B.1.c above shall be made based on the materiality of the payments that are not substantially similar relative to the life-contingent payments.

2. The term “jumbo contract” means a contract with an initial consideration equal to or greater than \$250 million. Considerations for contracts issued by an insurer to the same contract holder within 90 days shall be combined for purposes of determining whether the contracts meet this threshold.

**Guidance Note:** If multiple contracts meet this criterion in aggregate, then each contract is a jumbo contract.

3. The term “non-jumbo contract” means a contract that does not meet the definition of a jumbo contract.
4. The term “premium determination date” means the date as of which the valuation interest rate for the contract, certificate or contract feature being valued is determined.
5. The term “initial age” means the age of the annuitant as of his or her age last birthday relative to the premium determination date. For joint life contracts, certificates or contract features, the “initial age” means the initial age of the younger annuitant. If a contract, certificate or contract feature for an annuitant is being valued on a standard mortality table as an impaired annuitant, “initial age” means the rated age. If a contract, certificate or contract feature is being valued on a substandard mortality basis, “initial age” means an equivalent rated age.
6. The term “Table X spreads” means the prescribed VM-22 Section ~~13~~<sup>14</sup> current market benchmark spreads for the quarter prior to the premium determination date, as published on the Industry tab of the NAIC website. The process used to determine Table X spreads is the same as that specified in VM-20 Appendix 2.D for Table F, except that JP Morgan and Bank of America bond spreads are averaged over the quarter rather than the last business day of the month.
7. The term “expected default cost” means a vector of annual default costs by weighted average life. This is calculated as a weighted average of the VM-20 Table A prescribed annual default costs published on the Industry tab of the NAIC website in effect for the quarter prior to the premium determination date, using the prescribed portfolio credit quality distribution as weights.
8. The term “expected spread” means a vector of spreads by weighted average life. This is calculated as a weighted average of the Table X spreads, using the prescribed portfolio credit quality distribution as weights.
9. The term “prescribed portfolio credit quality distribution” means the following credit rating distribution:
  - a. 5% Treasuries
  - b. 15% Aa bonds (5% Aa1, 5% Aa2, 5% Aa3)
  - c. 40% A bonds (13.33% A1, 13.33% A2, 13.33% A3)\*
  - d. 40% Baa bonds (13.33% Baa1, 13.33% Baa2, 13.33% Baa3)\*

\*40%/3 is used unrounded in the calculations.

#### C. Determination of the Statutory Maximum Valuation Interest Rate

##### 1. Valuation Rate Buckets

- a. For the purpose of determining the statutory maximum valuation interest rate, the contract, certificate or contract feature being valued must be assigned to one of four Valuation Rate Buckets labeled A through D.
- b. If the contract, certificate or contract feature has no life contingencies, the Valuation Rate Bucket is assigned based on the length of the reference period (RP), as follows:

**Table 3-1: Assignment to Valuation Rate Bucket by Reference Period Only**



<b>RP ≤ 5 Years</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
A	B	C	D

- c. If the contract, certificate or contract feature has life contingencies, the Valuation Rate Bucket is assigned based on the length of the RP and the initial age of the annuitant, as follows:

**Table 3-2: Assignment to Valuation Rate Bucket by Reference Period and Initial Age**

<b>Initial Age</b>	<b>RP ≤ 5Y</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
<b>90+</b>	A	B	C	D
<b>80–89</b>	B	B	C	D
<b>70–79</b>	C	C	C	D
<b>&lt; 70</b>	D	D	D	D

2. Premium Determination Dates

- a. The following table specifies the decision rules for setting the premium determination date for each of the contracts, certificates and contract features listed in Section 1:

**Table 3-3: Premium Determination Dates**

<b>Section</b>	<b>Item Description</b>	<b>Premium determination date</b>
A.2.a	Immediate annuity	Date consideration is determined and committed to by contract holder
A.2.b	Deferred income annuity	Date consideration is determined and committed to by contract holder
A.2.c	Structured settlements	Date consideration is determined and committed to by contract holder
A.2.d and A.2.e	Fixed payout annuities resulting from settlement options or annuitizations from host contracts	Date consideration for benefit is determined and committed to by contract holder
A.2.f	Supplementary contracts	Date of issue of supplementary contract
A.2.g	Fixed income payment streams from CDAs, AV becomes 0	Date on which AV becomes 0
A.2.h	Fixed income payment streams from guaranteed living benefits, AV becomes 0	Date on which AV becomes 0

A.2.i	Group annuity and related certificates	Date consideration is determined and committed to by contract holder
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**Guidance Note:** For the purposes of the items in the table above, the phrase “date consideration is determined and committed to by the contract holder” should be interpreted by the company in a manner that is consistent with its standard practices. For some products, that interpretation may be the issue date or the date the premium is paid.

b. Immaterial Change in Consideration

If the premium determination date is based on the consideration, and if the consideration changes by an immaterial amount (defined as a change in present value of less than 10% and less than \$1 million) subsequent to the original premium determination date, such as due to a data correction, then the original premium determination date shall be retained. In the case of a group annuity contract where a single premium is intended to cover multiple certificates, certificates added to the contract after the premium determination date that do not trigger the company’s right to reprice the contract shall be treated as if they were included in the contract as of the premium determination date.

3. Statutory Maximum Valuation Interest Rate

- a. For a given contract, certificate or contract feature, the statutory maximum valuation interest rate is determined based on its assigned Valuation Rate Bucket (Section 14.C.1) and its Premium Determination Date (Section 14.C.2) and whether the contract associated with it is a jumbo contract or a non-jumbo contract.
- b. Statutory maximum valuation interest rates for jumbo contracts are determined and published daily by the NAIC on the Industry tab of the NAIC website. For a given premium determination date, the statutory maximum valuation interest rate is the daily statutory maximum valuation interest rate published for that premium determination date.
- c. Statutory maximum valuation interest rates for non-jumbo contracts are determined and published quarterly by the NAIC on the Industry tab of the NAIC website by the third business day of the quarter. For a given premium determination date, the statutory maximum valuation interest rate is the quarterly statutory maximum valuation interest rate published for the quarter in which the premium determination date falls.

d. Quarterly Valuation Rate:

For each Valuation Rate Bucket, the quarterly valuation rate is defined as follows:

$$I_q = R + S - D - E$$

Where:

- a. R is the reference rate for that Valuation Rate Bucket (defined in Section 14.C.4);
- b. S is the spread rate for that Valuation Rate Bucket (defined in Section 14.C.5);
- c. D is the default cost rate for that Valuation Rate Bucket (defined in Section 14.C.6);

and

d. E is the spread deduction defined as 0.25%.

e. Daily Valuation Rate:

For each Valuation Rate Bucket, the daily valuation rate is defined as follows:

$$I_d = I_q + C_{d-1} - C_q$$

Where:

- a.  $I_q$  is the quarterly valuation rate for the calendar quarter preceding the business day immediately preceding the premium determination date;
- b.  $C_{d-1}$  is the daily corporate rate (defined in Section 1314.C.7) for the business day immediately preceding the premium determination date; and
- c.  $C_q$  is the average daily corporate rate (defined in Section 1314.C.8) corresponding to the same period used to develop  $I_q$ .

For jumbo contracts, the daily statutory maximum valuation interest rate is the daily valuation rate ( $I_d$ ) rounded to the nearest one-hundredth of one percent (1/100 of 1%).

#### 4. Reference Rate

Reference rates are updated quarterly as described below:

- a. The “quarterly Treasury rate” is the average of the daily Treasury rates for a given maturity over the calendar quarter prior to the premium determination date. The quarterly Treasury rate is downloaded from <https://fred.stlouisfed.org>, and is rounded to two decimal places.
- b. Download the quarterly Treasury rates for two-year, five-year, 10-year and 30-year U.S. Treasuries.
- c. The reference rate for each Valuation Rate Bucket is calculated as the weighted average of the quarterly Treasury rates using Table 1 weights (defined in Section 1314.C.9) effective for the calendar year in which the premium determination date falls.

#### 5. Spread

The spreads for each Valuation Rate Bucket are updated quarterly as described below:

- a. Use the Table X spreads from the NAIC website for WALs two, five, 10 and 30 years only to calculate the expected spread.
- b. Calculate the spread for each Valuation Rate Bucket, which is a weighted average of the expected spreads for WALs two, five, 10 and 30 using Table 2 weights (defined in Section 3.I) effective for the calendar year in which the premium determination date falls.

#### 6. Default costs for each Valuation Rate Bucket are updated annually as described below:

- a. Use the VM-20 prescribed annual default cost table (Table A) in effect for the quarter prior to the premium determination date for WAL two, WAL five and WAL 10 years only to calculate the expected default cost. Table A is updated and published annually on

the Industry tab of the NAIC website during the second calendar quarter and is used for premium determination dates starting in the third calendar quarter.

- b. Calculate the default cost for each Valuation Rate Bucket, which is a weighted average of the expected default costs for WAL two, WAL five and WAL 10, using Table 3 weights (defined in Section 4314.C.9) effective for the calendar year in which the premium determination date falls.

7. Daily Corporate Rate

Daily corporate rates for each valuation rate bucket are updated daily as described below:

- a. Each day, download the Bank of America Merrill Lynch U.S. corporate effective yields as of the previous business day's close for each index series shown in the sample below from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from the table below\]](https://research.stlouisfed.org/fred2/series/[replace with series name from the table below]).

**Table 3-4: Index Series Names**

Maturity	Series Name
1Y – 3Y	BAMLC1A0C13YEY
3Y – 5Y	BAMLC2A0C35YEY
5Y – 7Y	BAMLC3A0C57YEY
7Y – 10Y	BAMLC4A0C710YEY
10Y – 15Y	BAMLC7A0C1015YEY
15Y+	BAMLC8A0C15PYEY

- b. Calculate the daily corporate rate for each valuation rate bucket, which is a weighted average of the Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 4314.C.9) effective for the calendar year in which the business date immediately preceding the premium determination date falls.

8. Average Daily Corporate Rate

Average daily corporate rates are updated quarterly as described below:

- a. Download the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields for each index series shown in Section 3.G.1 from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from Section 4314.C.7.a\]](https://research.stlouisfed.org/fred2/series/[replace with series name from Section 4314.C.7.a]).

- b. Calculate the average daily corporate rate for each valuation rate bucket, which is a weighted average of the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 14.C.9) for the same calendar year as the weight tables (i.e. Tables 1, 2, and 3) used in calculating  $I_q$  in Section 14.C.3.e.

9. Weight Tables 1 through 4

The system for calculating the statutory maximum valuation interest rates relies on a set of four tables of weights that are based on duration and asset/liability cash-flow matching analysis for representative annuities within each valuation rate bucket. A given set of weight tables is applicable to the calculations for every day of the calendar year.

In the fourth quarter of each calendar year, the weights used within each valuation rate bucket for determining the applicable valuation interest rates for the following calendar year will be updated using the process described below. In each of the four tables of weights, the weights in a given row (valuation rate bucket) must add to exactly 100%.

Weight Table 1

The process for determining Table 1 weights is described below:

- a. Each valuation rate bucket has a set of representative annuity forms. These annuity forms are as follows:
  - i. Bucket A:
    - a) Single Life Annuity age 91 with 0 and five-year certain periods.
    - b) Five-year certain only.
  - ii. Bucket B:
    - a) Single Life Annuity age 80 and 85 with 0, five-year and 10-year certain periods.
    - b) 10-year certain only.
  - iii. Bucket C:
    - a) Single Life Annuity age 70 with 0 and 15-year certain periods.
    - b) Single Life Annuity age 75 with 0, 10-year and 15-year certain periods.
    - c) 15-year certain only.
  - iv. Bucket D:
    - a) Single Life Annuity age 55, 60 and 65 with 0 and 15-year certain periods.
    - b) 25-year certain only.
- b. Annual cash flows are projected assuming annuity payments are made at the end of each year. These cash flows are averaged for each valuation rate bucket across the annuity forms for that bucket using the statutory valuation mortality table in effect for the following calendar year for

individual annuities for males (ANB).

- c. The average daily rates in the third quarter for the two-year, five-year, 10-year and 30-year U.S. Treasuries are downloaded from <https://fred.stlouisfed.org> as input to calculate the present values in Step d.
- d. The average cash flows are summed into four time period groups: years 1–3, years 4–7, years 8–15 and years 16–30. (**Note:** The present value of cash flows beyond year 30 are discounted to the end of year 30 and included in the years 16–30 group. This present value is based on the lower of 3% and the 30-year Treasury rate input in Step c.)
- e. The present value of each summed cash-flow group in Step d is then calculated by using the Step 3 U.S. Treasury rates for the midpoint of that group (and using the linearly interpolated U.S. Treasury rate when necessary).
- f. The duration-weighted present value of the cash flows is determined by multiplying the present value of the cash-flow groups by the midpoint of the time period for each applicable group.
- g. Weightings for each cash-flow time period group within a valuation rate bucket are calculated by dividing the duration weighted present value of the cash flow by the sum of the duration weighted present value of cash flow for each valuation rate bucket.

Weight Tables 2 through 4

Weight Tables 2 through 4 are determined using the following process:

- i. Table 2 is identical to Table 1.
  - ii. Table 3 is based on the same set of underlying weights as Table 1, but the 10-year and 30-year columns are combined since VM-20 default rates are only published for maturities of up to 10 years.
  - iii. Table 4 is derived from Table 1 as follows:
    - a) Column 1 of Table 4 is identical to column 1 of Table 1.
    - b) Column 2 of Table 4 is 50% of column 2 of Table 1.
    - c) Column 3 of Table 4 is identical to column 2 of Table 4.
    - d) Column 4 of Table 4 is 50% of column 3 of Table 1.
    - e) Column 5 of Table 4 is identical to column 4 of Table 4.
    - f) Column 6 of Table 4 is identical to column 4 of Table 1.
10. Group Annuity Contracts

For a group annuity purchased under a retirement or deferred compensation plan (Section ~~13~~14.A.2.i), the following apply:

- a. The statutory maximum valuation interest rate shall be determined separately for each certificate, considering its premium determination date, the certificate holder's initial age, the reference period corresponding to its form of payout and whether the contract is a jumbo contract or a non-jumbo contract.

**Guidance Note:** Under some group annuity contracts, certificates may be purchased on different

dates.

- b. In the case of a certificate whose form of payout has not been elected by the beneficiary at its premium determination date, the statutory maximum valuation interest rate shall be based on the reference period corresponding to the normal form of payout as defined in the contract or as is evidenced by the underlying pension plan documents or census file. If the normal form of payout cannot be determined, the maximum valuation interest rate shall be based on the reference period corresponding to the annuity form available to the certificate holder that produces the most conservative rate.

**Guidance Note:** The statutory maximum valuation interest rate will not change when the form of payout is elected.

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Valuation Manual Section II, Reserve Requirements

Subsection 2: Annuity Products

- A. This subsection establishes reserve requirements for all contracts classified as annuity contracts as defined in SSAP No. 50 in the AP&P Manual.
- B. Minimum reserve requirements for variable annuity (VA) contracts and similar business, specified in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, shall be those provided by VM-21. The minimum reserve requirements of VM-21 are considered PBR requirements for purposes of the *Valuation Manual*.
- C. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued prior to 1/1/2024 are those requirements as found in VM-A and VM-C as applicable, with the exception of the minimum requirements for the valuation interest rate for single premium immediate annuity contracts, and other similar contracts, issued after Dec. 31, 2017, including those fixed payout annuities emanating from host contracts issued on or after Jan. 1, 2017, and on or before Dec. 31, 2017. The maximum valuation interest rate requirements for those contracts and fixed payout annuities are defined in ~~Section 13.14~~ of VM-22, Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves.
- D. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued on 1/1/2024 and later are those requirements as found in Sections 1 through ~~12~~ 13 of VM-22.

The requirements in this section are still considered a part of PBR requirements and therefore are applicable to VM-G.

The below principles may serve as key considerations for assessing whether VM 21 or VM 22 requirements apply:

- D. ~~Minimum reserve requirements apply:~~
- E. ~~Index for index-linked or modified guaranteed annuity contracts or riders that satisfy both of the following conditions may be a key consideration for application of VM 22 requirements; and are issued on 1/1/2024 and later are those requirements; as found in Sections 1 through 13 of VM-22.:~~
  - 1. Guarantees the principal amount of purchase payments, net of any partial withdrawals, and interest credited thereto, less any deduction (without regard to its timing) for sales, administrative or other expenses or charges.
  - 2. b. —Credits a rate of interest under the contract prior to the application of any market value adjustments that is at least equal to the minimum rate required to be credited by the standard nonforfeiture law in the jurisdiction in which the contract is issued.

~~Guidance Note: Paragraph E.1.b is intended to apply prior to the application of any market value adjustments for modified guaranteed annuities where the underlying assets are held in a separate account. If meeting Paragraph E.1.b prior to the application of any market value adjustments and Paragraph E.1.a above, it may be appropriate to value such contracts under VM-22 requirements.~~

Minimum reserve requirements:

**Commented [X697]:** We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

**Commented [VM22698R697]:** Waylon Peoples comment letter: Extend small company exemption in place for life PBR (VM-20) to VM-22.

**Commented [VM22699R697]:** The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

**Commented [CD700]:** "non-variable annuity"?

**Commented [VM22701R700]:** Edits to address this comment will be reflected in next exposure

**Commented [X702]:** "Section 13 of VM-22" may need to be updated if it is decided to have separate chapters for VM-22 VIR and VM-22 PBR.

**Commented [VM22703R702]:** Edits to address this comment will be reflected in next exposure

**Commented [CD704]:** "non-variable annuity"?

**Commented [VM22705R704]:** Edits to address this comment will be reflected in next exposure

**Commented [CD706]:** Consider adding the sentence: "The minimum reserve requirements of VM-22 are considered PBR requirements for purposes of the Valuation Manual." This is so VM-G will apply to VM-22, which would be appropriate.

**Commented [VM22707R706]:** Edits to address this comment will be reflected in next exposure

**Commented [X708]:** "Index-linked" annuity is not defined – only RILA and FIA in VM-22, recommend to revise the language or add a definition to define "index linked".

**Commented [X709]:** Recommend adding this part to E.1.b and delete the Guidance Note.

**Commented [VM22710R709]:** Edits to address this comment will be reflected in next exposure

for index

F. ~~2. Index-linked or modified guaranteed annuity contracts or riders that do not satisfy either of the two conditions listed above~~ criteria in Paragraph Section 2.E.1 and Section 2.E.2 above and E.1.ii may be a key consideration for application of VM-21 are issued on 1/1/2024 and later are those requirements as found in VM-21.

**Commented [X711]:** VM-21 specifically says “These requirements do not apply to contracts falling under the scope of VM-A-255: Modified Guaranteed Annuities; however, they do apply to contracts listed above that include one or more subaccounts containing features similar in nature to those contained in modified guaranteed annuities (MGAs) (e.g., market value adjustments).” Is this a contradiction?

**Commented [X712]:** Consistent with E above.

**Commented [VM22713R712]:** Edits to address this comment will be reflected in next exposure

Subsection 6: Riders and Supplemental Benefits

**Guidance Note:** Policies ~~Designs of policies~~ or contracts with riders and supplemental benefits which are created to simply disguise benefits subject to the Valuation Manual section describing the reserve methodology for the base product to which they are attached, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs with similar riders.

A. If a rider or supplemental benefit is attached to a health insurance product, deposit-type contract, or credit life or disability product, it may be valued with the base contract unless it is required to be separated by regulation or other requirements.

B. For supplemental benefits on life insurance policies or annuity contracts, including Guaranteed Insurability, Accidental Death or Disability Benefits, Convertibility, ~~Nursing Home Benefits~~ or Disability Waiver of Premium Benefits, the supplemental benefit may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, ~~VM-22~~, VM-A, and/or VM-C, as applicable.

~~C.~~ ULSG and other secondary guarantee riders on a life insurance policy shall be valued with the base policy and follow the reserve requirements for ULSG policies under VM-20, VM-A and/or VM-C, as applicable.

~~D.C.~~ ~~Any~~ any guaranteed minimum benefits on life insurance policies or annuity contracts not subject to Paragraph C above including, but not limited to, Guaranteed Minimum Accumulation Benefits, Guaranteed Minimum Death Benefits, Guaranteed Minimum Income Benefits, Guaranteed Minimum Withdrawal Benefits, Guaranteed Lifetime Income Benefits, Guaranteed Lifetime Withdrawal Benefits, Guaranteed Payout Annuity Floors, Waiver of Surrender Charges, Return of Premium, Systematic Withdrawal Benefits under Required Minimum Distributions, and all similar guaranteed benefits shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

~~E.D.~~ If a rider or supplemental benefit to a life insurance policy or annuity contract that is not addressed in Paragraphs B, C, or D above possesses any of the following attributes, the rider or supplemental benefit shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

1. The rider or supplemental benefit does not have a separately identified premium or charge.
2. After issuance, the rider or supplemental benefit premium, charge, value or benefits are determined by referencing the base policy or contract features or performance.
3. After issuance, the base policy or contract value or benefits are determined by referencing the rider or supplemental benefit features or performance. The deduction of rider or benefit premium or charge from the contract value is not sufficient for a determination by reference.

~~F.E.~~ If a term life insurance rider on the named insured[s] on the base life insurance policy does not meet the conditions of Paragraph E above, and either (1) guarantees level or near level premiums until a specified duration followed by a material premium increase; or (2) for a rider for which level or near level premiums are expected for a period followed by a material premium increase, the rider is

Commented [X714]: Still need the word "designs" otherwise this is saying the whole policy/contract was only created to disguise benefits, which would never be true.

Commented [VM22715R714]: Edits to address this comment will be reflected in next exposure

Commented [X716]: This reference is another place where there would be a benefit distinguishing the PBR sections of VM-22 from the non-PBR sections.

Commented [VM22717R716]: Edits to address this comment will be reflected in next exposure

Commented [X718]: These parallel requirements can be combined.

Commented [VM22719R718]: Edits to address this comment will be reflected in next exposure

separated from the base policy and follows the reserve requirements for term policies under VM20, VM-A and/or VM-C, as applicable.

~~G.F.~~ For all other riders or supplemental benefits on life insurance policies or annuity contracts not addressed in Paragraphs B through F above, the riders or supplemental benefits may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A and/or VM-C, as applicable. For a given rider, the election to include riders or supplemental benefits with the base policy or contract shall be determined at the policy form level, not on a policy-by-policy basis, and shall be treated consistently from year-to-year, unless otherwise approved by the domiciliary commissioner.

~~H.G.~~ Any supplemental benefits and riders offered on life insurance policies or annuity contracts that would have a material impact on the reserve (for VM-20 and VM-22) or TAR (for VM-21) if elected later in the contract life, such as joint income benefits, nursing home benefits, or withdrawal provisions on annuity contracts, shall be considered when determining reserves (for VM-20 and VM-22) or reserves and TAR (for VM-21) using the following principles:

1. Policyholders with living benefits and annuitization in the same contract will generally use the more valuable of the two benefits.
2. When advantageous, policyholders will commence living benefit payouts if not started yet.

**Commented [X720]:** Simplifications are judged relative to reserves for VM-20/VM-21 and TAR for VM-21.

**Commented [VM22721R720]:** Edits to address this comment will be reflected in next exposure

**Commented [X722]:** This section states that "When advantageous, policyholders will commence living benefit payouts if not started yet." This text seems to directly contradict VM-22 Section 6.H.2 which states "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally". We suggest revising 6.H.2 to align with the text of 10.D.8.

VM-01: Definitions for Terms in Requirements

- The term “Guaranteed Minimum Accumulation Benefit” (GMAB) means a guaranteed benefit providing, or resulting in the provision, that an amount payable on the contractually determined maturity date of the benefit will be increased and/or will be at least a minimum amount. Only such guarantees having the potential to produce a contractual total amount payable on benefit maturity that exceeds the account value, or in the case of an annuity providing income payments, an amount payable on benefit maturity other than continuation of any guaranteed income payments, are included in this definition.
  
- The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:
  - Increased by an amount that may be either specified by or computed from other policy or contract values; and
  - Contains either
    - The potential to produce a contractual total amount payable on such death that exceeds the account value, or
    - In the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.
  
- The term “guaranteed minimum income benefit” (GMIB) means an option under which the contractholder has the right to apply a specified minimum amount that could be greater than the amount that would otherwise be available in the absence of such benefit to provide periodic income using a specified purchase basis.

**Commented [X723]:** We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

**Commented [VM22724R723]:** The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

**Page 6: [1] Commented [X49] TDI 11/9/2021 8:56:00 AM**

Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly reflected. Recommend deleting the whole section 1.C.3 including item (a) and item (b).

**Page 6: [2] Commented [X53] TDI 11/9/2021 8:59:00 AM**

The revised language “sudden and significant levels of withdrawal and surrenders” replaces the original language “run on the bank” and is less clear. Does “significant” mean severe or extreme? Or just appreciably? Withdraws and surrenders certainly may vary by projected economic scenarios. Recommend using the original language “run on the bank” that had a clearer intent.

**Page 7: [3] Commented [X57] ACLI**

We recommend removing the bullet “Significant future reserve increases as an unfavorable scenario is realized” as this is extraneous.

**Page 7: [4] Commented [X61] ACLI**

It seems the definitions included in this section are largely only used for the purpose of establishing the Scope in Section 2. Since this is intended to be a principles-based methodology, recommend a strong definition of "Fixed Annuity" instead of specific products underneath this business. The first paragraph in A. Scope seems to provide this with specific references which are out of scope. If changing the scope section, we would suggest deleting the various product definitions if not used elsewhere; if these definitions are potentially applied beyond VM-22, we would suggest moving any necessary definitions to VM-01.

**Page 7: [5] Commented [VM2262R61] VM-22 Subgroup 6/23/2022 9:09:00 AM**

No objections from the Subgroup to an approach that is broader and focuses less on definitions. ACLI will follow-up with proposed revisions to the scope section

**Page 7: [6] Commented [CD63] CA DOI 12/30/2021 3:11:00 PM**

The format of this Definitions section is inconsistent with other parts of the VM. In VM-01 and VM-21, each defined term is numbered, and is defined in this format (for example):

1. The term "buffer annuity" is interchangeable with the term "registered index-linked annuity (RILA)", as defined in Section 1.D.?

**Page 7: [7] Commented [X65] TDI 11/9/2021 9:04:00 AM**

The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity (RILA) since Buffer Annuity is a subset of RILA. RILA can have different downside protections such as "Buffer" or "Floor". Recommend deleting Buffer Annuity or add descriptions for Buffer Annuity as a subtype in the RILA definition.

**Page 7: [8] Commented [X67] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 7: [9] Commented [X69] TDI 11/9/2021 9:05:00 AM**

The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Page 7: [10] Commented [X71] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as FIA does there need to be guaranteed principle?

**Page 7: [11] Commented [X75] TDI 11/9/2021 9:07:00 AM**

The definition of FIA describes the account value as typically with guaranteed principal. Since FIA always has the guaranteed principal, recommend deleting the wording “typically”.

**Page 9: [12] Commented [X97] ACLI**

Is “typically” intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance, it would be helpful to clarify where a longevity swap contract falls within these definitions. Notably, index-based longevity swaps should be out of scope as they do not meet definition of “annuity contract” in SSAP 50. It should also be made explicit that PRT contracts can include lump sum benefits, death benefits and cash balance benefits as well.

**Page 9: [13] Commented [VM2298R97] VM-22 Subgroup 7/13/2022 4:13:00 PM**

Academy will review this comment as part of revisiting the longevity reinsurance definition.

**Page 9: [14] Commented [X99] ACLI**

It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product from VM-22 requirements.

**Page 9: [15] Commented [VM22100R99] VM-22 Subgroup 6/23/2022 9:12:00 AM**

ACLI already following up on a proposal to address the scope and definitions, which will address this issue.

**Page 9: [16] Commented [X103] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 9: [17] Commented [X105] TDI 11/9/2021 9:06:00 AM**

The wording “after (or from)” the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as “from” the issue date.

**Page 11: [18] Commented [VM22120R119] VM-22 Subgroup 6/23/2022 9:14:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [19] Commented [VM22126R123] VM-22 Subgroup 6/23/2022 9:14:00 AM**

The VM-22 Subgroup voted to adopted “Option 1” for Reserving Categories

**Page 11: [20] Commented [VM22125R123] VM-22 Subgroup 3/2/2022 4:12:00 PM**

See Equitable comment letter: supports full aggregation, but if choosing between the two exposed options for two reserving categories, prefers option 2.

**Page 11: [21] Commented [VM22124R123] VM-22 Subgroup 3/2/2022 2:59:00 PM**

See NY comment letter: supports option 1, with additional category for "other" for any other contract with supporting assets such that there is greater reinvestment and longevity risks, than disintermediation risk and other risks associated with policyholder behavior as of the valuation date.

**Page 11: [22] Commented [X123] TDI 11/9/2021 9:23:00 AM**

The reserving categories for VM-22 are not included in Scope. Recommend including the defined reserving categories in the section when outlining Scope.

**Page 11: [23] Commented [X121] ACLI**

We would support reworking this section to rely on principles, rather than definitions to determine what is in and out of scope. As product innovation continues, a simple list may not appropriately accommodate the applicability of this chapter. However, if such a list is included, then we believe it should align with the full list presented in Section 13.

**Page 11: [24] Commented [VM22122R121] VM-22 Subgroup 6/23/2022 9:16:00 AM**

ACLI will follow up with a proposed revision to the definitions and scope section

**Page 11: [25] Commented [VM22128R127] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [26] Commented [CD127] CA DOI 12/30/2021 3:27:00 PM**

suggest numbering the paragraphs within this section

**Page 11: [27] Commented [CD129] CA DOI 12/30/2021 3:27:00 PM**

suggest swapping the order of this section. That is, start with the "in scope" list, rather than the "out of scope" list.

Also, it seems like there should be specific mentions of GMDBs and GLBs, as there are in VM-21, since those guarantees can also be found on FIAs.

**Page 11: [28] Commented [VM22130R129] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [29] Commented [X131] TDI 11/9/2021 9:12:00 AM**

Since buffer annuities are a subset of RILA, recommend deleting buffer annuities.

**Page 11: [30] Commented [VM22132R131] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [31] Commented [CD133] CA DOI 12/30/2021 3:28:00 PM**

this is not defined in the Definition section. should it be?

**Page 11: [32] Commented [VM22134R133] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure



**Page 11: [33] Commented [X135] TDI 11/9/2021 9:17:00 AM**

This needs to be revised to be in line with VM-21 Section 2.A. Consider removing "such as" list and adding a cross-reference to VM-21 Section 2.A.

**Page 11: [34] Commented [VM22136R135] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [35] Commented [CD137] CA DOI 12/30/2021 3:28:00 PM**

should this be "non-variable annuities" since that is term used in Section 1.A?

**Page 11: [36] Commented [VM22138R137] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [37] Commented [VM22142R141] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [38] Commented [VM22140R139] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [39] Commented [VM22144R143] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [40] Commented [VM22146R145] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [41] Commented [CD147] CA DOI 12/30/2021 3:31:00 PM**

should this be "Non-Variable Annuity"? Otherwise, should "Fixed Annuity" be defined in the Definitions section?

**Page 11: [42] Commented [VM22148R147] VM-22 Subgroup 6/23/2022 9:18:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 12: [43] Commented [X155] TDI 11/9/2021 9:19:00 AM**

Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

It is normal to then list what requirements such excluded contracts would follow. However, the statement here is more problematic because you can be excluded from the SR but still subject to VM-22.

**Page 12: [44] Commented [X159] TDI 11/9/2021 9:25:00 AM**

We still have a question about whether RBC factors are still at an appropriate level, if principles-based capital is not developed. Were they set assuming that this reserve was at a CTE(70) level in the first place, or were they dependent on the prior framework?

**Page 12: [45] Commented [X161] TDI 11/9/2021 9:33:00 AM**

Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section references, or update proposal to have the PBR and non-PBR sections of this VM-22 draft in different chapters. After having reviewed, we think it would be much more clear to reconsider the use of "VM-23" for the PBR requirements to avoid ambiguity around scope/exclusions. The non-PBR sections also just don't seem to fit in this draft, and there is now ambiguity around whether other parts of VM-22 apply to them (scope, effective date, principles, etc.).

**Page 12: [46] Commented [VM22162R161] VM-22 Subgroup 7/19/2022 4:41:00 PM**

Subgroup discussed moving current VM-22 requirements (currently Section 14) to "VM-V". Will further discuss at the end of tier 3 comments.

**Page 12: [47] Commented [X165] TDI 11/9/2021 9:28:00 AM**

Can a company wait until the end of the transition period to start PBR, but then apply PBR to the issues from during the transition period? This was unclear for VM-20, and still seems unclear here. Need to be explicit one way or the other.

**Page 12: [48] Commented [VM22168R167] VM-22 Subgroup 6/23/2022 9:20:00 AM**

Discussed with Subgroup and decided to not have early adoption before the start of the three year transition period.

**Page 12: [49] Commented [CD167] CA DOI 12/30/2021 3:33:00 PM**

Will we (or should we) allow for any early adopters (like we did for VM-21)? It would seem reasonable to us to consider accommodating early adopters

**Page 12: [50] Commented [VM22166R165] VM-22 Subgroup 6/23/2022 9:19:00 AM**

Discussed with Subgroup and decided to keep the VM-22 language silent on this issue, similar to VM-20, leaving it to be determined on a case-by-case basis for each state.

**Page 15: [51] Commented [CD187] CA DOI 12/30/2021 3:35:00 PM**

suggest expanding header to "Stochastic Exclusion Test", for clarity

**Page 15: [52] Commented [VM22188R187] VM-22 Subgroup 7/19/2022 4:45:00 PM**

No objections from the Subgroup

**Page 15: [53] Commented [X189] ACLI**

Seems to imply that only SPIAs would pass due to the linkage to Section 13. But the reference to interest rates should be broader, if even necessary. Suggest editing as:

"these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, and VM-C, and with the statutory maximum valuation rate for immediate annuities specified in Section 13."

**Page 15: [54] Commented [VM22190R189] VM-22 Subgroup 6/23/2022 11:26:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [55] Commented [CD191] CA DOI 12/30/2021 3:36:00 PM**

Suggest rewording to just say "the stochastic exclusion test". There is only 1 SET, with 3 ways of passing it. Therefore, the current wording is confusion because it suggests that there are multiple SETs.

**Page 15: [56] Commented [VM22192R191] VM-22 Subgroup 6/23/2022 9:23:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [57] Commented [X193] ACLI**

We believe this guidance note is unnecessary as the intent of the section is clear, and the wording is possibly confusing.

**Page 15: [58] Commented [VM22194R193] VM-22 Subgroup 7/19/2022 4:46:00 PM**

No objections to removing this guidance note.

**Page 15: [59] Commented [X195] TDI 11/9/2021 9:57:00 AM**

The statement in this section is not acceptable as discussed in the previous TX comment letter. This will have the effect of potentially masking blocks that need PBR.

**Page 15: [60] Commented [VM22196R195] VM-22 Subgroup 6/23/2022 9:26:00 AM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure

**Page 15: [61] Commented [X197] ACLI**

This section seems to indicate that the grouping of contracts in exclusion testing should be the same as the grouping of contracts for aggregation. This might cause fewer product types to be qualifying for exclusion if the test must be performed at a higher level of aggregation.

**Page 15: [62] Commented [VM22198R197] VM-22 Subgroup 6/23/2022 9:27:00 AM**

Subgroup voted to use wording consistent with VM-20, which prohibits aggregating contracts with significantly different risk profiles.

**Page 15: [63] Commented [CD199] CA DOI 12/30/2021 3:42:00 PM**

for clarity, change this reference to "Section 3.D"

**Page 15: [64] Commented [VM22200R199] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [65] Commented [CD201] CA DOI 12/30/2021 3:41:00 PM**

again, suggest rewording this to just say "the stochastic exclusion test"

**Page 15: [66] Commented [VM22202R201] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [67] Commented [VM22204R203] VM-22 Subgroup 7/16/2022 9:55:00 PM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure.

**Page 15: [68] Commented [X205] ACLI**

Either in this item or in Section 12 allocation to contracts not covered by PBR methodology in VM-22 needs to be addressed e.g., carve out because reserves calculated on seriatim formulaic basis.

**Page 15: [69] Commented [VM22206R205] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [70] Commented [X207] ACLI**

This sub-section seems more appropriate in Section 4 (or pulled out completely and consolidated within "I. Introduction" or "VM-01" and applied to all PBR methods).

**Page 15: [71] Commented [VM22208R207] VM-22 Subgroup 7/16/2022 9:57:00 PM**

The Subgroup decided to focus solely on VM-22 for now and hold off exploring on common principles and assumptions sections

**Page 15: [72] Commented [CD209] CA DOI 12/30/2021 3:43:00 PM**

VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques is missing (including the Guidance Note). Would it make sense to add it?

**Page 15: [73] Commented [VM22210R209] VM-22 Subgroup 7/19/2022 4:49:00 PM**

Subgroup decided to add this section.

**Page 15: [74] Commented [VM22212R211] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 18: [75] Commented [X237] TDI 11/9/2021 10:38:00 AM**

If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below.

Recommend specifying the revenue in this bullet to be gross premium since there are other revenue items that are discussed in other bullets.

**Page 18: [76] Commented [X241] ACLI**

The purpose of this guidance note is not clear as these charges would be reflected in the cash flows.

**Page 18: [77] Commented [X245] TDI 11/9/2021 10:42:00 AM**

Changed investment expense to be maintenance expense so that it does not repeat what is included in bullet h.

**Page 18: [78] Commented [X249] TDI 11/9/2021 10:41:00 AM**

Take out the revenues that covers the investment expenses and added a separate bullet under bullet "a" for other revenues.

**Page 18: [79] Commented [CD251] CA DOI 12/30/2021 3:53:00 PM**

Both net and gross cash flows have to be considered, so I don't agree with the addition of "Net" here

**Page 22: [80] Commented [VM22303R302] VM-22 Subgroup 7/5/2022 12:38:00 PM**

Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Page 35: [81] Commented [VM22396] VM-22 Subgroup 7/5/2022 4:21:00 PM**

New language drafted by select Subgroup Members to provide certain conditions under which SPIA contracts could automatically pass the exclusion test

**Page 35: [82] Commented [CD397] CA DOI 12/30/2021 4:11:00 PM**

Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstration or Certifications). The language gets confusing (here and elsewhere) when you start saying there are different "types" of SETs.

**Page 36: [83] Commented [VM22400R399] VM-22 Subgroup 6/23/2022 10:10:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [84] Commented [X401] ACLI**

We recommend removing "pension risk transfer business" from products scoped out of SET certification method. It is unclear why this business would be treated differently from individually issued business for testing intended to capture interest rate risk.

**Page 36: [85] Commented [VM22402R401] VM-22 Subgroup 3/2/2022 2:51:00 PM**

Subgroup voted to keep PRT ineligible for the Certification Method

**Page 36: [86] Commented [CD403] CA DOI 12/30/2021 4:12:00 PM**

See earlier comments about the use of "future"

**Page 36: [87] Commented [VM22404R403] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 36: [88] Commented [VM22406R405] VM-22 Subgroup 8/18/2022 3:18:00 PM**

The Subgroup decided to be consistent with APF 2020-12, which was adopted for VM-20 and VM-21 in the 1/1/2023 Valuation Manual.

**Page 36: [89] Commented [VM22410R409] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [90] Commented [VM22408R407] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [91] Commented [CD411] CA DOI 12/30/2021 4:14:00 PM**

what is meant by "aggregate risk levels"? Aggregated across what? Need clarification on the intentions for adding this phrase, when it is not in VM-20. Otherwise, i would suggest deleting this.

**Page 36: [92] Commented [VM22412R411] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [93] Commented [X413] TDI 11/18/2021 9:49:00 PM**

This is not in VM-20 and would substantially change the exclusion. The intent is not to allow you to group a block that has material interest rate risk with a larger block that is insensitive to interest rate risks and thereby pass. If "aggregate" referred to potential compounding of interest rate, longevity, or asset risk then this could be redrafted to clearly call out a 4th category of risk due to a combination of the first three. However, I think this is already implicitly covered.

**Page 36: [94] Commented [VM22414R413] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [95] Commented [VM22416R415] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [96] Commented [CD417] CA DOI 12/30/2021 4:15:00 PM**

note, there is no insertion of "aggregate risk levels across" here, like there was above. (to be clear, i don't support adding it.)

**Page 36: [97] Commented [VM22418R417] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [98] Commented [CD419] CA DOI 12/30/2021 4:16:00 PM**

This wording is a little clunky here. My suggestion:

"A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great..."

**Page 36: [99] Commented [VM22420R419] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [100] Commented [VM22422R421] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [101] Commented [X421] TDI 9/7/2021 9:28:00 AM**

Replace all "contracts" with "contracts and certificates"

**Page 36: [102] Commented [VM22425R424] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [103] Commented [VM22427R426] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [104] Commented [VM22429R428] VM-22 Subgroup 6/23/2022 1:36:00 PM**

Edits to address this comment will be reflected in next exposure

**Page 36: [105] Commented [X430] TDI 11/18/2021 10:37:00 PM**

Need to add a review of the company's mortality and/or longevity risk.

**Page 36: [106] Commented [VM22431R430] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [107] Commented [X432] ACLI**

As written, the SERT assumes a single premium product given the change of the denominator to the scenario reserve. Alternative product designs (such as longevity swap) could result in unintended results. We recommend maintaining consistency with VM-20 and using a denominator of future benefits (annuity payments, DBs, etc., excluding premium considerations, expenses, etc.).

**Page 36: [108] Commented [VM22433R432] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 36: [109] Commented [X434] TDI 11/18/2021 9:53:00 PM**

Using (a) in the denominator instead of VM-20's (c) which is a PV of benefits could make this ratio unstable when the scenario reserve (a) is very small. This is particularly applicable if the block being tested does not have CSV.

**Page 36: [110] Commented [VM22435R434] VM-22 Subgroup 6/23/2022 10:13:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 36: [111] Commented [X436] TDI 11/18/2021 9:59:00 PM**

The variability should be assured to be immaterial based on the company's materiality standard.

**Page 37: [112] Commented [VM22458R457] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [113] Commented [CD457] CA DOI 12/30/2021 4:18:00 PM**

better to keep the reference to the full Section (i.e., Section 7.C.1)

**Page 37: [114] Commented [VM22456R455] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [115] Commented [VM22460R459] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [116] Commented [CD459] CA DOI 12/30/2021 4:20:00 PM**

why delete this? seems like it wouldn't hurt to keep this language, for additional clarity

**Page 37: [117] Commented [X461] TDI 11/18/2021 10:09:00 PM**

Be consistent with standard VM references

**Page 37: [118] Commented [VM22462R461] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 37: [119] Commented [CD463] CA DOI 12/30/2021 4:20:00 PM**

better to reference the full Section (i.e., Section 7.C.1.b)

**Page 37: [120] Commented [VM22464R463] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 43: [121] Commented [X524] TDI 11/19/2021 8:39:00 AM**

This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Instead, this should be addressed through the Error factor for new programs being temporarily larger.

**Page 43: [122] Commented [X526] TDI 11/19/2021 8:50:00 AM**

Reinstate the original sentence which puts the reflection of hedging into the greater context of reflecting the company's investment policy.

**Page 43: [123] Commented [X528] TDI 11/19/2021 8:42:00 AM**

Agree that the uncertainty associated with new strategies should be handled via the E factor, not through blanket exclusion.



Draft: 9/7/22

Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
August 17, 2022

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Aug. 17, 2022. The following Subgroup members participated: Ben Slutsker, Chair (MN); Ahmad Kamil, Elaine Lam, and Thomas Reedy (CA); Mike Yanacheak (IA); Vincent Tsang (IL); Nicole Boyd (KS); William Leung (MO); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Yujie Huang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Reviewed the VM-22 Project Timeline

Mr. Slutsker reviewed the VM-22 project timeline and comment log (Attachment Twenty-Nine-A). He said the target effective date is January 2025. He noted that the timing of the VM-22 field test is dependent upon the timing of the economic scenario generator (ESG) field test completion.

2. Discussed Tier Three Comments in the VM-22 Draft

The Subgroup continued to review tier three comments on the proposed VM-22 framework (Attachment Twenty-Nine-B). Mr. Slutsker said the American Council of Life Insurers (ACLI) recommended adding the guidance note on the “Relationship to RBC Requirements” from VM-21, Requirements for Principle-Based Reserves for Variable Annuities. Brian Bayerle (ACLI) suggested keeping the guidance note and reevaluating it after completion of the VM-22 field test. Mr. Slutsker said the American Academy of Actuaries (Academy) did not include the guidance note in its initial draft of the VM-22 framework. Mr. Carmello said he prefers to remove the guidance note. Mr. Slutsker said the guidance note will be replaced with a drafting note indicating that the references to risk-based capital (RBC) have been removed.

Mr. Bayerle recommended broadening the language defining Principle 2 by changing the words “reserving category” to “prescribed guardrails.” The Subgroup agreed to the wording change and separately agreed to keep the guidance note on market value adjustments on liability cash flows.

Ms. Hemphill said the guidance note following Section 4.A.1 should be retained for consistency with VM-21. Mr. Chupp pointed out that the guidance note requires editing to align with VM-21. Mr. Slutsker said the guidance note will be removed now and reconsidered when the Life Actuarial (A) Task Force reviews and reconciles VM-20, Requirements for Principle-Based Reserves for Life Products, VM-21, and VM-22.

The ACLI recommended moving portions of Section 4.A.4 to Section 9, which houses most of the hedging requirements. Mr. Slutsker said specific hedging requirements will be moved to Section 9.

Mr. Slutsker responded to the comment on Section 4.A.4.b by saying that the language in amendment proposal form (APF) 2020-12, which was recently adopted for inclusion in the 2023 *Valuation Manual*, should be used to revise the VM-22 language. Ms. Hemphill said that APF 2020-1 provided updates to the language of VM-20 and VM-21. She agreed that the VM-22 language should be consistent with the language in the APF. Mr. Bayerle noted that the ACLI will be proposing changes that were intended for inclusion in APF 2020-12 but were deferred due to time constraints. Mr. Slutsker said any new hedging amendment proposals that are submitted will be applied to VM-20, VM-21, and VM-22.

Ms. Hemphill said the Texas Department of Insurance (TDI) comments on Section 4.A.4.b.i.c questions whether stress testing alone is sufficient to support the index credit hedge margin, and whether the real-world hedging error and the modeling error in reflecting the future hedging should be separated when considering the hedge breakage expense assumptions. Mr. Slutsker asked if the paragraph should be modified to indicate that both the index credit margin and the real-word margin should be captured in the hedge margin and reported separately in VM-31, PBR Actuarial Report Requirements for Business Subject to a Principle-Based Valuation. Ms. Hemphill answered affirmatively. Mr. Slutsker said that in addition to adding wording requiring the separate reporting for the error terms, the reference to stress testing will be removed from the paragraph.

The Subgroup discussed the ACLI comment on whether the revenue sharing section should be retained. Mr. Bayerle suggested keeping the section because of the possibility of having to combine VM-21 and VM-22 in the future. Based on Mr. Bayerle's input the Subgroup agreed to retain the revenue sharing section.

Mr. Slutsker discussed the TDI comment recommending that the projection period for VM-22 be aligned with the projection period defined in VM-20. The Subgroup agreed to delete the second sentence of the paragraph.

Bill Wilton (Unaffiliated) discussed his comment recommending the deletion of the reference to pre-tax interest maintenance reserve (IMR). Mr. Slutsker said the Subgroup will refer the issue to the Task Force.

Having no further business, the VM-22 (A) Subgroup adjourned.

[https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/08 17/8\\_17 VM-22 Minutes.docx](https://Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/VM-22 Calls/08 17/8_17 VM-22 Minutes.docx)

**PBR VM-22 Project Draft Timeline**

(updated 7/19/22)

EFFECTIVE DATE GOALS	PBR VM-22 effective with three year transition period												1/1/2028								PBR VM-22 mandatory prospectively															
	1/1/2025	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8				
DRAFT TIMELINE	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8			
SPA DG - develop assumptions/methodology																																				
VM22 SG calls - Address comment letters and edits																																				
ESG Field Test #1																																				
NAIC National Meeting August 9-13, Portland																																				
VM-22 exposure (90 days preferable)																																				
SPA Discussions at VM-22 Subgroup																																				
NAIC National Meeting December 12 - 15, Tampa FL																																				
VM-31 SG meetings to prepare recommendation																																				
VM-22 Field Test Final exposure & preparations																																				
Discuss comments from Fall VM-22 draft exposure																																				
ESG Field Test #2 (timeline estimate)																																				
VM-22 and C3P1 Field Test																																				
Compile/analyze Field Test results																																				
Discuss field test results on public calls																																				
Resolve outstanding items and changes from field test																																				
LATF exposure and discussion of comments																																				
LATF Adoption																																				
A Committee Adoption																																				
NAIC Exec & Plenary Adoption																																				

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
1	VM-22 Scope and Definitions	Keep current definitions for what is in-scope or focus only on non-variable annuities out of scope	4/13/2022	1	Openness to use Section II of the Valuation Manual to determine scope rather than relying on definitions; ACLI to provide potential draft wording
2	Reserving categories and aggregation	Determine Option 1 or Option 2 from exposed reserve category definitions	4/13/2022	1	Preliminary vote to pursue Option 1
3	Small Company Exemption	Fixed Annuity PBR exemption, similar to life PBR exemption for smaller carriers?	4/13/2022	1	Voted to pursue a "Fixed Annuity PBR Exemption"; ACLI to propose a set of potential draft criteria for the exemption
4	Reinvestment Guardrail	Keep VM-20/VM-21 mix, Academy mix, TX mix, or other? Wait until field test for final decision?	4/27/2022	1	Wait until observing impact in field testing results before voting on a reinvestment mix guardrail
5	Principles & Risks Across VM Chapters	Build one section in the Valuation Manual for principles that apply to VM-20, VM-21, and VM-22	4/27/2022	2	Openness to interested party proposals for a common "principles" section, but will focus on working through other VM-22 decisions before exploring
6	General Assumptions Section	Add a section to the VM-22 draft on general considerations and requirements for assumption	4/27/2022	2	Will include a proposed general assumptions section ("Section 13") from Texas, to be consistent with a recent APF adoption on VM-21
7	Transition Period	Permit 1) early adoption and 2) retrospective adoption to the start of the 3-year transition period?	4/27/2022	2	Decided to not pursue early adoption; VM-22 will stay silent on retrospective adoption to start of transition period, similar to VM-20
8	Minimum Error for Index Credit Hedges	What should be the minimum breakage expense (i.e., error) for modeling hedges supporting index credits?	5/11/2022	2	Will wait until seeing field testing results before minimum threshold
9	Longevity Reinsurance	How should longevity reinsurance be defined and treat negative reserves/recurring premiums?	5/11/2022	2	Academy presented on longevity reinsurance and will provide a refined definition; New Jersey proposal is exposed for reserving requirements
10	Categories for VM-31 Disclosures	What level of granularity should be required for disclosing PBR reserves for product groups in VM-31?	5/11/2022	2	Will wait until seeing field testing results before determining granularity of disclosures
11	Exclusion Test: SPIA contracts	Allow SPIAs to have the option of PBR vs. pre-PBR valuation without an exclusion test?	6/1/2022	2	Voted to allow SPIAs automatically pass exclusion testing, subject to criteria around optionality and a liability duration threshold (TBD)
12	Exclusion Test: PRT Certification Method	Allow PRT contracts to use the Certification Method for exclusion testing?	6/1/2022	2	Do not allow PRT to undergo the Certification Method
13	Exclusion Test: Grouping	Group between products with significantly different risk profiles?	6/1/2022	2	Do not allow grouping between products with significantly different risk profiles, consistent with VM-20 and TDI's proposal
14	Exclusion Test: Future Premiums	For the stochastic exclusion ratio test, determine whether to include future premiums	6/1/2022	2	Include future premiums in the numerator, but only benefits and expenses in the denominator, consistent with VM-20.
15	Exclusion Test: Deterministic Reserve	To pass the deterministic test, does the company need to pass or disclose 16 scenarios with baseline mortality?	6/1/2022	2	Require passing the ratio test for 16 economic scenarios under 100% of the anticipated experience mortality assumption
17	Import Reinsurance Wording from VM-20	Import VM-20 wording on incorporating contractual or additional characteristics for modeling reinsurance?	6/14/2022	2	Include proposed wording from VM-20
18	Fair Value Certification	Include fair value certification, similar to existing VM-21 requirement?	6/14/2022	2	Include fair value certification disclosure for non-index credit hedging programs
16	PRT Mortality	Permit PRT mortality with limited credibility to follow a third-party provider instead of an industry table?	6/14/2022	2	Voted in favor of using a prescribed table; do not permit a third party table upon limited credibility
19	Allocation Method	Determine Option 1 or Option 2? Wait until observing field test results before deciding?	6/29/2022	2	Wait until field test results and further research by ACLI on tax implications prior to revisiting

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
20	Working Reserve	Use a working reserve concept to serve as a floor for contracts without cash surrender value?	6/29/2022	2	Academy will work on a working reserve concept for contracts without cash surrender value, though may be little impact due to reserving categories
21	Grouping for Fund Value Depletion	Appropriate reserving category for deferred annuities with GNMWBS/GMIBs that have depleted fund value	6/29/2022	2	Decided to leave these contracts in the "Payout Reserving Category" for now, but will add a drafting note to solicit feedback an optional approach
22	RBC Guidance Note	Retain the guidance note in VM-21 that discusses the relationship between reserves and RBC?	TBD	3	ACL will provide the full text for the Subgroup to consider
23	Principle 1	Should the edits to Principle 1 for VM-22 be incorporated into VM-21 as well?	TBD	3	For now, will plan to focus only on VM-22, as LATF can explore the other VM chapters upon the Subgroup's recommendation of the VM-22 draft to LATF
24	Principle 2	Does setting an SR to be reasonably conservative over a span of economic cycles contradict other principles?	TBD	3	ACL will provide the full text for the Subgroup to consider
25	Aggregation Limits	Guidance note stating aggregation may not be possible for experience rated group and reinsurance treaties	TBD	3	Will include this text in the VM-22 draft
26	Principle 3	Delete "Generally, assumptions are to be based on the conservative end of the confidence interval"?	TBD	3	Retain this language
27	Principle 5	Delete sentence about the principle to not reduce the reserve unless reducing the risk?	TBD	3	Retain this language
28	Risks not reflected	Retain or remove the list of "Risks not reflected" in VM-22?	TBD	3	Remove subsection 3, but keep section 4 and update title to include "risks not reflected"
29	Separate Account References	Recommendation to delete all references to "separate accounts" in VM-22	TBD	3	For now, will keep references to "separate accounts" and will add a drafting note to solicit feedback
30	Combination Risks	Proposal to delete "Risks modeled in the company's risk assessment processes that are related to the contracts"	TBD	3	Retain this language
31	Immaterial Risks	Recommendation to delete sentence about not reflecting risks that do not materially affect the reserves	TBD	3	Remove this language
32	Liquidity Risk	Refer to liquidity risks for "run on bank" or "sudden and significant levels of withdrawals and surrenders"	TBD	3	Use the "run on bank" description
33	Significant Future Reserve Increases	Strike this item from the list of risks not reflected?	TBD	3	Retain this language
34	Fixed Annuity Definition	Need to define a "fixed annuity"?	TBD	3	Will replace all references to "fixed annuity" with "non-variable annuity"
35	Longevity Swaps	Are these contracts included in the definition of PRT?	TBD	3	As a follow-up, Academy will include reviewing the definition of PRT when revisiting the definition of longevity risk
36	CSV and GMDB definitions	Retain VM-21 definitions for "cash surrender value" and "guaranteed minimum death benefits"?	TBD	3	Will not retain the definition for "cash surrender value" and will move the "guaranteed minimum death benefits" to VM-01
37	Assumed reserve level for RBC	Question whether CTE70 was the assumed level for reserves upon determining RBC	TBD	3	Question relates to RBC, and therefore did not discuss as part of the VM-22 Subgroup
38	VM-23	Consider reinstating "VM-23" to avoid confusion around the where exemptions/exclusions point to vs. PBR?	TBD	3	Subgroup discussed moving current VM-22 requirements (currently Section 14) to "VM-V". Will further discuss at the end of tier 3 comments

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
39	Pre-Reinsurance	Request to develop further guidance around pre-reinsurance	TBD	3	ACL will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure
40	Deterministic Reserve	Use this term for the single scenario reserve calculated upon passing the deterministic exclusion test?	TBD	3	Will replace "scenario reserve" with "deterministic reserve". Also added "aggregate minimum reserve" as the term for the final reserve
41	Deterministic Certification Option	Keep this terminology or change?	TBD	3	Given that the term "deterministic reserve" will not be used, decided to keep this terminology
42	Stochastic Exclusion Test	Change Section 3.E to "Stochastic Exclusion Test" header?	TBD	3	Accepted comment and made change to update header
43	Guidance Note for Exclusion Test	Remove the guidance note that clarifies that AG33/AG35 may be used upon passing the exclusion test	TBD	3	Decided to remove this guidance note
44	Prudent Estimate Assumptions	Move Section 3.G to Section 4 of the document?	TBD	3	Subgroup decided to hold off for now
45	Simplifications	Port over VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques?	TBD	3	Subgroup agreed to add this wording for simplifications, to be consistency with VM-21
46	Review experience every three years?	Make this a requirement for the qualified actuary?	TBD	3	Subgroup agreed to include a requirement to review experience every three years
47	Simplification example for the SPA	Add an example of a simplification for the SPA upon development	TBD	3	Delete for now and revisit upon development of the SPA
48	Stochastic Mortality	Consider including stochastic mortality in the stochastic reserve for longevity reinsurance?	TBD	3	Subgroup agreed to port over VM-20 language on stochastic modeling when static prudent estimates are not appropriate for liability assumptions
49	NVA Guidance Note	Is the market value adjustment guidance note from VM-21 still appropriate for VM-22?	TBD	3	
50	Hedging Reorganization	Move parts of Section 4.A.4 to Section 9, which covers hedging	TBD	3	
51	Future Hedging Programs	Align VM-22 draft to be consistent with APF 2020-12 adopted edits for VM-21?	TBD	3	
52	Index Credit Hedge Margin	Does this reflect both model risk and real-world error? How does stress testing justify the error?	TBD	3	
53	Paragraph on Hedging	Remove this paragraph if included in another section, even upon edits from TDI/OPBR?	TBD	3	
54	Revenue Sharing	Is the section of revenue sharing applicable to non-variable products?	TBD	3	
55	Projection Period	Use consistent language with VM-20?	TBD	3	
56	PIMR	Include pre-tax IMR in VM-22?	TBD	3	
57	NVA on CSV Floor	Apply the market value adjustment factor to the cash surrender value reserve floor for applicable products?	TBD	3	

NAIC VM-22 Drafting Discussion Log

#	Topic	Description	Date	Tier	Outcome
58	Consistency with Managed Business	Modify NAER requirement to have assets modeled in a manner consistent with how business is managed?	TBD	3	
59	Limits on NAER	Define a specific cap or floor for the NAER instead of saying it should not be "unreasonably high"?	TBD	3	
60	Reserve Floor	NY comment on using CARVM as a reserve floor	TBD	3	
61	Longevity Reinsurance & SPA	Require the k-factor approach to address negative reserve issue for longevity reinsurance in SPA?	TBD	3	
62	Longevity Reinsurance & Exclusion Testing Standard Projection Amount	Require the k-factor approach or something similar for longevity reinsurance in exclusion testing? Equitable comment on supporting SPA with company assumptions insignificant risk factors	TBD	3	
63	Exclusion Testing & SPA	Modify exclusion test to address the standard projection amount?	TBD	3	
64	Hedging eligibility for exclusion testing	Refine wording around the restriction for not allowing blocks with hedging programs to use exclusion testing? If using the NY7 for the Certification Method, add mortality stress scenarios?	TBD	3	
65	Mortality Stress Tests		TBD	3	
66	Mortality Shock	Include the mortality shock for the ratio test based on the company materiality standard if more restrictive?	TBD	3	
67	Baseline Mortality Test	Include the baseline mortality test in determining the exclusion test?	TBD	3	
68	Permutations	Include note on number of exclusion test permutations for clarity?	TBD	3	
69	Non-Proportional Reinsurance	Retain section on non-proportional reinsurance?	TBD	3	
70	SERT if Other Tests Fail	Prohibit passing the SERT if the demonstration test fails?	TBD	3	
71	Demonstration Test	Remove options in 1.a and 2.a?	TBD	3	
72	Deterministic Exclusion for SPA	Consider SPA for the deterministic exclusion test	TBD	3	
73	Deterministic Exclusion Scenario	Consider disintermediation risk for the SPA scenario?	TBD	3	
74	SPIA Guidance Note	Remove guidance note specifying that the deterministic exclusion test generally applies to SPIAs?	TBD	3	
75	Delta Hedging	Replace or remove example about delta hedging for VM-22?	TBD	3	

**NAIC VM-22 Drafting Discussion Log**

#	Topic	Description	Date	Tier	Outcome
77	Policyholder Behavior Considerations	Suggestion to re-word as considerations instead of questions?	TBD	3	
78	Non-Eligible Benefits	Remove guidance note to limit modeling non-elective benefits after CSV is depleted if reducing reserves?	TBD	3	
79	100% Policyholder Efficiency	Assuming 100% policyholder inefficiency contradicts VM Section II 6.H.2, so revise VM Section II?	TBD	3	
80	NGE Board of Directors	Comment that only allowing NGE exclusion if approved by the Board does not necessarily seem reasonable	TBD	3	
81	Unsupported Judgment	Comment to remove the reference to using "unsupported actuarial judgement" from Section 11	TBD	3	
82	Mortality and Reinsurance	Does Section 11.A require evaluation of a plus vs. minus segment differently for pre- vs. post reinsurance?	TBD	3	
83	Little or No Data	Does "little or no data" need to be in the header of Section 11.B.3?	TBD	3	
84	Improvement with Limited Experience	Consider not only credibility blending the base mortality assumption but also the improvement assumption	TBD	3	
85	Option 1 DR vs SR	Require separate allocation for DR vs. SR for allocation Option 1 (Section 13)?	TBD	3	
86	Option 2 for Direct Iteration Method	Option 2 is not designed to work for the Direct Iteration Method	TBD	3	
87	Option 2 Single Scenario	Could produce unstable allocation when products with different risk profiles are aggregated for PRR	TBD	3	
88	Index-linked annuity	This term is used in the proposed Section II, Subsection 2 draft, but is not defined	TBD	3	
89	Modified Guaranteed Annuities (MGAs)	VM-21 has language that exempts contracts falling under scope of MDL-255, does this contradict Section II edits?	TBD	3	



**Comment Categories:**

- Tier 1: **Key Decision Points** – Discuss first
- Tier 2: **High Substance Edits** – Discuss second
- Tier 3: **Moderate Substance Edits** – Discuss third
- Tier 4: **Noncontroversial or Low Substance Edits** – Will expose and only discuss upon comment

**VM-22 PBR: Requirements for Principle-Based Reserves for Non-Variable Annuities**

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**Commented [CD1]:** Please clarify which version (i.e., effective date) of the VM was used for the comparison. Before any changes for VM-22 are adopted, a final comparison against the latest version of the VM will need to be performed.

**Commented [VM222R1]:** Final comparison to be made prior to adoption

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Commented [X3]: Note that part of the 2022 VM updates was to replace all instances of "stochastic reserve" with "SR" other than the initial definition in VM-01.

Commented [VM224R3]: Edit to be reflected in next exposure

Section 1: Background

A. Purpose

Sections 1 through 13 of these requirements establish the minimum reserve valuation standard for non-variable annuity contracts as defined in Section 2.A and issued on or after 1/1/2024. Section 14 of these requirements establish the maximum valuation rate for payout annuities for contracts issued on or after 1/1/2018. For all contracts encompassed by the Scope, these requirements constitute the Commissioners Annuity Reserve Valuation Method (CARVM) and, for certain contracts and certificates, the Commissioners Reserve Valuation Method (CRVM).

**Guidance Note:** CRVM requirements apply to some group pension contracts.

**Guidance Note:**

Relationship to RBC Requirements

These requirements anticipate that the projections described herein are used for the determination of RBC for all of the contracts falling within the scope of these requirements. These requirements and the RBC requirements for the topics covered within Sections 4.A through 4.E are identical. However, while the projections described in these requirements are performed on a basis that ignores federal income tax, a company may elect to conduct the projections for calculating the RBC requirements by including projected federal income tax in the cash flows and reducing the discount interest rates used to reflect the effect of federal income tax as described in the RBC requirements. A company that has elected to calculate RBC requirements in this manner may not switch back to using a calculation that ignores the effect of federal income tax without approval from the domiciliary commissioner.

B. Principles

The projection methodology used to calculate the ~~stochastic reserve~~ SR is based on the following set of principles. These principles should be followed when interpreting and applying the methodology in these requirements and analyzing the resulting reserves.

**Guidance Note:** The principles should be considered in their entirety, and it is required that companies meet these principles with respect to those contracts that fall within the scope of these requirements and are in force as of the valuation date to which these requirements are applied.

**Principle 1:** The objective of the approach used to determine the ~~stochastic reserve~~ SR is to quantify the amount of statutory reserves needed by the company to be able to meet contractual obligations in light of the risks to which the company is exposed with an element of conservatism consistent with statutory reporting objectives.

**Principle 2:** The calculation of the ~~stochastic reserve~~ SR is based on the results derived from an analysis of asset and liability cash flows produced by the application of a stochastic cash-

**Commented [X5]:** The proposal suggests VM-22 is not operative until 1/1/2024, which contradicts Section 13 and existing requirements. We would suggest rewording this to clarify that Section 13 is effective after 12/31/2017. Further, we would suggest consistency in labeling of dates (either all text or all numeric).

**Commented [VM226R5]:** Edits to address this comment will be reflected in next exposure

**Commented [CD7]:** might be clearer to refer to "Section 2.A" here

**Commented [VM228R7]:** No objections from the Subgroup to an approach that is broader and focuses on Section 2.A. ACLI will follow-up with proposed revisions to the scope section

**Commented [X9]:** The statement only addresses "contracts". Recommend adding "and certificates". Need to do a holistic review if where "and certificates" may be needed.

**Commented [VM2210R9]:** Edits to address this comment will be reflected in next exposure

**Commented [X11]: (Relationship to RBC Requirements):** The VM-21 guidance note was not included in VM-22; however, we believe it would be appropriate to retain and reword to say, "products that calculate a stochastic reserve", since the relationship to RBC would likely be maintained.

**Commented [VM2212R11]:** Will discuss after ACLI proposes specific draft wording

**Commented [X13]:** We would support consistent application of principles across all chapters as currently VM-20 does not have a like set of principles. We believe this could involve a broader discussion of the assorted product requirements in the VM. As a shorter-term fix, we would recommend generalizing the principles where appropriate and moving these to "Section 1: Introduction" or "VM-01" and equally applying to VM-20.

**Commented [VM2214R13]:** Discussed with Subgroup. Members are open and interested to a common principles chapter, but decided to hold off on developing for now.

**Commented [CD15]:** for consistency, will this edit be considered for VM-21 as well?

**Commented [VM2216R15]:** VM-22 Subgroup will initially focus on VM-22. Consistency with other VM chapters can be explored after development of initial Subgroup recommendation for VM-22.

flow model to equity return and interest rate scenarios. For each scenario, the greatest present value of accumulated deficiency is calculated. The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions and reserving categories) to allow the natural offset of risks within a given scenario. The methodology uses a projected total cash flow analysis by including all projected income, benefit, and expense items related to the business in the model and sets the stochastic reserve SR at a degree of confidence using the CTE measure applied to the set of scenario specific greatest present values of accumulated deficiencies that is deemed to be reasonably conservative over the span of economic cycles.

**Guidance Note:** Examples where full aggregation between contracts may not be possible include experience rated group contracts and the operation of reinsurance treaties.

**Principle 3:** The implementation of a model involves decisions about the experience assumptions and the modeling techniques to be used in measuring the risks to which the company is exposed. Generally, assumptions are to be based on the conservative end of the confidence interval. The choice of a conservative estimate for each assumption may result in a distorted measure of the total risk. Conceptually, the choice of assumptions and the modeling decisions should be made so that the final result approximates what would be obtained for the stochastic reserve SR at the required CTE level if it were possible to calculate results over the joint distribution of all future outcomes. In applying this concept to the actual calculation of the stochastic reserve SR, the company should be guided by evolving practice and expanding knowledge base in the measurement and management of risk.

**Guidance Note:** The intent of Principle 3 is to describe the conceptual framework for setting assumptions. Section 10 provides the requirements and guidance for setting contract holder behavior assumptions and includes alternatives to this framework if the company is unable to fully apply this principle. More guidance and requirements for setting assumptions in general are provided in Section 12.

**Principle 4:** While a stochastic cash-flow model attempts to include all real-world risks relevant to the objective of the stochastic cash-flow model and relationships among the risks, it will still contain limitations because it is only a model. The calculation of the stochastic reserve SR is based on the results derived from the application of the stochastic cash-flow model to scenarios, while the actual statutory reserve needs of the company arise from the risks to which the company is (or will be) exposed in reality. Any disconnect between the model and reality should be reflected in setting prudent estimate assumptions to the extent not addressed by other means.

**Principle 5:** Neither a cash-flow scenario model ~~nor a method based on factors calibrated to the results of a cash-flow scenario model~~ can completely quantify a company's exposure to risk. A model attempts to represent reality but will always remain an approximation thereto and, hence, uncertainty in future experience is an important consideration when determining the stochastic reserve SR. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve solely to reduce the calculated stochastic reserve SR without also reducing risk on scenarios similar to those used

**Commented [X17]:** We support this principle but note that later sections appear to contradict this principle. For example, the statement "The analysis reflects prudent estimate assumptions for deterministic variables and is performed in aggregate (subject to limitations related to contractual provisions) to allow the natural offset of risks within a given scenario." contradicts with the introduction of additional reserve categories and other limitations (such as model segment restrictions).

**Commented [VM2218R17]:** Discuss adding "and reserving categories" to the parenthetical statement to avoid contradiction.

**Commented [X19]:** Principle 2: Recommend reinstating Guidance Note in Principle 2 to be consistent with VM-21.

**Commented [VM2220R19]:** No objections from Subgroup members to reinstating this guidance note.

**Commented [X21]:** We suggest deleting the sentence "Generally, assumptions are..." since it does not provide guidance. We also suggest tightening the remainder of the text for clarity.

**Commented [VM2222R21]:** Subgroup in favor of retaining language

**Commented [X23]:** [Redacted comment]

**Commented [VM2224R23]:** Subgroup agreed with this comment. Edits to address this comment will be reflected in next exposure.

**Commented [X25]:** Principle 5 has the statement "nor a method based on factors calibrated to the results of a cash flow scenario model" which is intended for the Alternative Methodology in VM-21. The statement should be deleted from VM-22.

**Commented [VM2226R25]:** Edits to address this comment will be reflected in next exposure

**Commented [X27]:** We recommend deleting the third sentence (starting with "Therefore, the use of assumptions...") because this lacks historical context and is covered by the final sentence.

**Commented [VM2228R27]:** Subgroup in favor of retaining language

in the actual cash-flow modeling are inconsistent with these principles. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit “foreknowledge” of the components of the required methodology.

C. Risks Reflected and Risks Not Reflected

1. The risks reflected in the calculation of reserves under these requirements arise from actual or potential events or activities that are both:
  - a. Directly related to the contracts falling under the scope of these requirements or their supporting assets; and
  - b. Capable of materially affecting the reserve.
2. Categories and examples of risks reflected in the reserve calculations include, but are not necessarily limited to:
  - a. Asset risks
    - i. Credit risks (e.g., default or rating downgrades).
    - ii. Commercial mortgage loan roll-over rates (roll-over of bullet loans).
    - iii. Uncertainty in the timing or duration of asset cash flows (e.g., shortening (prepayment risk) and lengthening (extension risk)).
    - iv. Performance of equities, real estate, and Schedule BA assets.
    - v. Call risk on callable assets.
    - vi. Separate account fund performance.
  - b. Liability risks
    - i. Reinsurer default, impairment, or rating downgrade known to have occurred before or on the valuation date.
    - ii. Mortality/longevity, persistency/lapse, partial withdrawal, and premium payment risks.

**Drafting Note:** Feedback welcome on whether to remove reference to separate accounts in VM-22. Whether references to separate accounts are retained or removed, consider making the treatment of such references consistent throughout VM-22.

**Commented [X29]:** Consistent with our comments on B, we would support consistent application of risks reflected across all chapters, rather than embedding the language in each chapter. Were this to be retained in VM-22, we would suggest maintaining consistency with VM-21 to avoid any confusion.

**Commented [VM2230R29]:** The Subgroup is open to a common chapter with all risks identified for different PBR frameworks, but decided to hold off on developing for now.

**Commented [CD31]:** VM-21 has "... and Risks Not Reflected" in this section header, which should be retained here since the section on risks not reflected is still in here.

**Commented [VM2232R31]:** Subgroup in favor of changing section header, as subsection 3 will be removed, but "risks not reflected" is still applicable to subsection 4

**Commented [CD33]:** Can a non-variable annuity have a separate account fund? I am not aware of any such annuity, that is not a variable annuity. Furthermore, all references to separate accounts and fund performance were deleted from this draft. Thus, we should consider deleting this item from the list.

**Commented [VM2234R33]:** Decided to retain for now, but add a drafting note to solicit feedback and mention the draft should be consistent throughout (as CA pointed out that the comment was regarding being internally consistent within the VM-22 draft).

- iii. Utilization risk associated with guaranteed living benefits.
  - iv. Anticipated mortality trends based on observed patterns of mortality improvement or deterioration, where permitted.
  - v. Annuitization risks.
  - vi. Additional premium dump-ins ~~or deposits~~ (high interest rate guarantees in low interest rate environments).
  - vii. Applicable expense risks, including fluctuation in maintenance expenses directly attributable to the business, future commission expenses, and expense inflation/growth.
- c. Combination risks
- i. Risks modeled in the company's risk assessment processes that are related to the contracts, as described above.
  - ii. Disintermediation risk (including such risk related to payment of surrender or partial withdrawal benefits).
  - iii. Risks associated with revenue-sharing income.
- ~~3. The risks not necessarily reflected in the calculation of reserves under these requirements are:~~
- a. ~~Those not associated with the policies or contracts being valued, or their supporting assets.~~
  - b. ~~Determined to not be capable of materially affecting the reserve.~~
34. Categories and examples of risks not reflected in the reserve calculations include, but are not necessarily limited to:
- a. Asset risks
    - i. Liquidity risks associated with ~~a sudden and significant levels of withdrawals and surrenders, "run on the bank."~~
  - b. Liability risks
    - i. Reinsurer default, impairment or rating downgrade occurring after the valuation date.
    - ii. Catastrophic events (e.g., epidemics or terrorist events).
    - iii. Major breakthroughs in life extension technology that have not yet fundamentally altered recently observed mortality experience.
    - iv. Significant future reserve increases as an unfavorable scenario is realized.
  - c. General business risks

- Commented [CD35]: Is there a distinction between "dump-ins" and "deposits"? Why are both words needed? Also, if it's determined that both words are needed, should this same change be made in VM-21?
- Commented [VM2236R35]: Edits to address this comment will be reflected in next exposure
- Commented [X37]: Recommend change to "fluctuation in" maintenance expenses for clarity
- Commented [VM2238R37]: Edits to address this comment will be reflected in next exposure
- Commented [CD39]: should this same change also be made to VM-21?
- Commented [VM2240R39]: Potential VM-21 will be examined separately from this Subgroup at a later point
- Commented [X41]: We recommend removing the bullet "Risks modeled in the company's risk assessment processes that are related to the contracts, as described above" as this is unclear and probably extraneous.
- Commented [VM2242R41]: Subgroup in favor of retaining language.
- Commented [X43]: We recommend removing this section. With the specific RBC language removed, the section loses meaning: "a" is unnecessary and "b" is redundant with other sections of the VM which allow for materiality considerations (language in VM-20 is likely better for this purpose and should be used consistently).
- Commented [VM2244R43]: Subgroup agrees with removing this section.
- Commented [CD45]: Suggest eliminated "policies or", since customarily, annuities are "contracts"
- Commented [VM2246R45]: Edits to address this comment will be reflected in next exposure
- Commented [CD47]: This is not in VM-21, and my suggestion would be to delete this
- Commented [VM2248R47]: Subgroup agrees with ... [1]
- Commented [X49]: Proposed revision is not appro ... [2]
- Commented [VM2250R49]: Subgroup agrees with ... [3]
- Commented [CD51]: should this same change also ... [4]
- Commented [VM2252R51]: Edits to address this ... [5]
- Commented [X53]: The revised language "sudden a ... [6]
- Commented [VM2254R53]: Subgroup in favor of ... [7]
- Commented [X55]: We recommend deleting the w ... [8]
- Commented [VM2256R55]: Edits to address this ... [9]
- Commented [X57]: We recommend removing the ... [10]
- Commented [VM2258R57]: Subgroup in favor re ... [11]
- Commented [X59]: List could be expanded to incl ... [12]
- Commented [VM2260R59]: Edits to address this ... [13]

- i. Deterioration of reputation.
- ii. Future changes in anticipated experience (reparameterization in the case of stochastic processes), which would be triggered if and when adverse modeled outcomes were to actually occur.
- iii. Poor management performance.
- iv. The expense risks associated with fluctuating amounts of new business.
- v. Risks associated with future economic viability of the company.
- vi. Moral hazards.
- vii. Fraud and theft.
- viii. Operational.
- ix. Litigation.

D. Specific Definitions for VM-22

Buffer Annuity

Interchangeable term for Registered Index Linked Annuity (RILA). See definition for Registered Index Linked Annuity below.

E.

- **Deferred Income Annuity (DIA)**  
 An annuity which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin one year 13 months or later after (or from) the issue date if the contract holder survives to a predetermined future age.
- **Fixed Indexed Annuity (FIA)**  
 An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to a n external index, subject to certain limits, typically with guaranteed principal.
- **Flexible Premium Deferred Annuity (FPDA)**  
 An annuity with an account value established with a premium amount but allows for additional deposits to be paid into the annuity over time, resulting in an increase to the account value. The contract also has a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase.
- **Funding Agreement**  
 A contract issued to an institutional investor (domestic and international non-qualified fixed income investors) that provides fixed or floating interest rate guarantees.

**Commented [X61]:** It seems the definitions included in this section are largely only used for the purpose of establishing the Scope in Section 2. Since this is intended to be a principles-based methodology, recommend a strong definition of "Fixed Annuity" instead of specific products underneath this business. The first paragraph in A. Scope seems to provide this with specific references which are out of scope. If changing the scope section, we would suggest deleting the various product definitions if not used elsewhere; if these definitions are potentially applied beyond VM-22, we would suggest moving any necessary definitions to VM-01.

**Commented [VM2262R61]:** No objections from the Subgroup to an approach that is broader and focuses less on definitions. ACLI will follow-up with proposed revisions to the scope section

**Commented [CD63]:** The format of this Definitions section is inconsistent with other parts of the VM. In VM-01 and VM-21, each defined term is numbered, and is defined in this format (for example):  
 1. The term "buffer annuity" is interchangeable with the term "registered index-linked annuity (RILA)", as defined in Section 1.D.?

**Commented [VM2264R63]:** Edits to address this comment will be reflected in next exposure

**Commented [X65]:** The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity (RILA) since Buffer Annuity is a subset of RILA. RILA can have different downside protections such as "Buffer" or "I... [14]

**Commented [VM2266R65]:** Edits to address this comment will be reflected in next exposure

**Commented [X67]:** Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 ... [15]

**Commented [VM2268R67]:** Edits to address this comment will be reflected in next exposure

**Commented [X69]:** The wording "after (or from)" the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as "from" the issue date.

**Commented [VM2270R69]:** Edits to address this comment will be reflected in next exposure

**Commented [X71]:** Is "typically" intended to be a requirement in the definition? That is, to qualify as FIA does there need to be guaranteed principle?

**Commented [VM2272R71]:** Edits to address this comment will be reflected in next exposure

**Commented [CD73]:** insert: "subject to certain limits,"

**Commented [VM2274R73]:** Edits to address this comment will be reflected in next exposure

**Commented [X75]:** The definition of FIA describes the account value as typically with guaranteed principal. ... [16]

**Commented [VM2276R75]:** Edits to address this comment will be reflected in next exposure

- Guaranteed Investment Contract (GIC)**  
 Insurance contract typically issued to a retirement plan (defined contribution) under which the insurer accepts a deposit (or series of deposits) from the purchaser and guarantees to pay a specified interest rate on the funds deposited during a specified period of time.
- Index Credit Hedge Margin**  
 A margin capturing the risk of inefficiencies in the company's hedging program supporting index credits. This includes basis risk, persistency risk, and the risk associated with modeling decisions and simplifications. It also includes any uncertainty of costs associated with managing the hedging program and changes due to investment and management decisions.
- Index Credit**  
 Any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to contract policy values that is linked to an index or indices. Amounts credited to the contract policy resulting from a floor on an index account are included.
- Index Crediting Strategy**  
 The strategy defined in a contract to determine index credits for a contract. This refers to ~~For example, this may refer to~~ underlying index, index parameters, date, timing, performance triggers, and other elements of the crediting method.
- Index Parameter**  
 Cap, floor, participation rate, spreads, or other features describing how the contract utilizes the index.
- Longevity Reinsurance**  
 An agreement, typically a reinsurance arrangement covering one or more group or individual annuity contracts, under which an insurance company assumes the longevity risk associated with periodic payments made to specified annuitants under one or more immediate or deferred payout annuity contracts. A common example is participants in one or more underlying retirement plans.
- Typically, the reinsurer pays a portion of the actual benefits due to the underlying annuitants (or, in some cases, a pre-agreed amount per annuitant), while the ceding insurance company retains the assets supporting the reinsured annuity payments and pays periodic, ongoing premiums to the reinsurer over the expected lifetime of benefits paid to the specified annuitants. Such agreements may contain net settlement provisions such that only one party makes ongoing cash payments in a particular period. Under these agreements, longevity risk may be transferred on either a permanent basis or for a prespecified period of time, and these agreements may or may not permit early termination.
- Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition. In particular,

Commented [CD77]: should be "contract"

Commented [VM2278R77]: Edits to address this comment will be reflected in next exposure

Commented [CD79]: should be "contract"

Commented [VM2280R79]: Edits to address this comment will be reflected in next exposure

Commented [X81]: We would suggest adding performance trigger to the list, along with other potential crediting methods; alternatively, the definition could specify that the crediting methods listed are examples only.

Commented [VM2282R81]: Edits to address this comment will be reflected in next exposure

Commented [X83]: The definition states that "Agreements which are not treated as reinsurance under Statement of Statutory Accounting Principles (SSAP) No. 61R are not included in this definition". Why is this the case and does this imply that longevity swaps are not within the scope of VM-22? Recommend adding to the out of scope list in "2.A. Scope" if that is the case. Clarification would also be helpful on what guidance should be used for these agreements if out of scope for VM-22. Further, we would suggest removing "typically" from the definition.

Commented [VM2284R83]: Academy will follow-up with proposed revisions to the definition of Longevity Reinsurance.

Commented [VM2285]: New Jersey comment letter: due to future premiums, longevity reinsurance may generate negative reserves, which can be used to eliminate or reduce other immediate annuity reserves. Suggest using net premium methodology, solving for a k factor at issue to solve for  $PV(\text{premiums}) = PV(\text{benefits})$ .

Commented [VM2286R85]: VM-22 Subgroup has exposed a proposal from NJ to address this issue.



contracts under which payments are made based on the aggregate mortality experience of a population of lives which are not covered by an underlying group or individual annuity contract (e.g., mortality index-based longevity swaps) are not included in this definition.

- **Market Value Adjustment (MVA) Annuity**

An annuity with an account value where withdrawals and full surrenders are subject to adjustments based on interest rates or index returns at the time of withdrawal/surrender. There could be ceilings and floors on the amount of the market-value adjustment.

- **Modified Guaranteed Annuity (MGA)**

A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account and the value of which are guaranteed if held for specified periods of time. [The contract contains nonforfeiture values and death benefits that are based upon a market-value adjustment formula if held for shorter periods.]

- **Multi-iple-Year Guaranteed Annuity (MYGA)**

A type of fixed non-variable annuity that provides a pre-determined and contractually guaranteed interest rate for specified periods of time, after which there is typically an annual reset or renewal of a multiple year guarantee period.

- **Pension Risk Transfer (PRT) Annuity**

An annuity, typically a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account, and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).

- **Registered Index-Linked Annuity (RILA)**

An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to a n external index, similar to a Fixed Indexed Annuity, but with downside risk exposure that may not guarantee full principal repayment. These contracts may include a cap on upside returns, and may also include a floor on downside returns which may be below zero percent.

- **Single Premium Immediate Annuity (SPIA)**

An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within 13 months one year after (or from) the issuance issue date.

- **Single Premium Deferred Annuity (SPDA)**

An annuity with an account value established with a single premium amount that grows with a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase. May also

Commented [X87]: We recommend editing the definition as follows "A type of market-value adjusted annuity contract where the underlying assets are most commonly held in an insurance company separate account..."

Commented [VM2288R87]: Edits to address this comment will be reflected in next exposure

Commented [X89]: To clarify definition of MGA, recommend adding "death benefits"

Commented [VM2290R89]: Edits to address this comment will be reflected in next exposure

Commented [CD91]: should this be "Multi-Year" instead of "Multiple Year"? The former is the more commonly used term for MYGA

Commented [VM2292R91]: Edits to address this comment will be reflected in next exposure

Commented [CD93]: "fixed annuity" is not defined. Is it better to change all instances of "fixed annuity" to "non-variable annuity" to be consistent with the terminology introduced in Section 1.A (and to be aligned with the actual VM-22 chapter name)? An alternative could be to add a definition for "fixed annuity", with the definition of it being a "non-variable annuity"

Commented [VM2294R93]: Subgroup in favor of the term "non-variable annuity" instead of "fixed annuity". Changes are made consistently throughout the VM-22 draft.

Commented [CD95]: ok to keep this as "multiple year"

Commented [VM2296R95]: Edits to address this comment will be reflected in next exposure

Commented [X97]: Is "typically" intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance [17]

Commented [VM2298R97]: Academy will review this comment as part of revisiting the longevity reinsurance [18]

Commented [X99]: It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product [19]

Commented [VM22100R99]: ACLI already following up on a proposal to address the scope and definitions, v [20]

Commented [X101]: If need to address Buffer Annuity (not sure this is needed), can add here as a subset of RILA

Commented [VM22102R101]: Edits to remove "Buffer Annuity" will be reflected in next exposure

Commented [X103]: Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guid [21]

Commented [VM22104R103]: Edits to address this comment will be reflected in next exposure

Commented [X105]: The wording "after (or from)" the issue date used in the DIA and SPIA definitions is con [22]

Commented [VM22106R105]: Edits to address this comment will be reflected in next exposure

include cases where the premium is accepted for a limited amount of time early in the contract life, such as only in the first duration.

- **Stable Value Contract**

A contract that provides limited investment guarantees, typically preserving principal while crediting steady, positive returns and protecting against losses or declines in yield. Underlying asset portfolios typically consist of fixed income securities, which may sit in the insurer’s general account, a separate account, or in a third-party trust. These contracts often support defined contribution or defined benefit retirement plan liabilities.

- **Structured Settlement Contract (SSC)**

A contract that provides periodic benefits and is purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes. ~~Adverse mortality is typically expected for these contracts.~~

- **Synthetic Guaranteed Investment Contract (Synthetic GIC)**

Contract that simulates the performance of a traditional GIC through a wrapper, swap, or other financial instruments, with the main difference being that the assets are owned by the ~~contract policyholder~~ or plan trust.

- **Term Certain Payout Annuity**

A contract issued, which offers guaranteed periodic payments for a specified period of time, not contingent upon mortality or morbidity of the annuitant.

- **Two-Tiered Annuity**

A deferred annuity with two tiers of account values. One, with a higher accumulation interest rate, is only available for annuitization or death. The other typically contains a lower accumulation interest rate, and is only available upon surrender.

~~The term “cash surrender value” means, for the purposes of these requirements, the amount available to the contract holder upon surrender of the contract. Generally, it is equal to the account value less any applicable surrender charges, where the surrender charge reflects the availability of any free partial surrender options. However, for contracts where all or a portion of the amount available to the contract holder upon surrender is subject to a market value adjustment, the cash surrender value shall reflect the market value adjustment consistent with the required treatment of the underlying assets. That is, the cash surrender value shall reflect any market value adjustments where the underlying assets are reported at market value, but it shall not reflect any market value adjustments where the underlying assets are reported at book value.~~

~~The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is increased by an amount that may be either specified by or computed from other policy or contract values; and~~

**Commented [X107]:** Suggest striking sentence “Adverse mortality is typically expected for these contracts.” from definition. Additionally, it is possible that there may be non-standard settlements.

**Commented [VM22108R107]:** Edits to address this comment will be reflected in next exposure

**Commented [CD109]:** suggest spelling out GIC first, followed by the acronym

**Commented [VM22110R109]:** Edits to address this comment will be reflected in next exposure

**Commented [CD111]:** should be “contract holder”

**Commented [VM22112R111]:** Edits to address this comment will be reflected in next exposure

**Commented [CD113]:** this definition still applies, should we keep it?

**Commented [VM22114R113]:** Comment retracted in light of “Cash Surrender Value” definition being included in VM-01

**Commented [CD115]:** this definition still applies, should we keep it?

**Commented [VM22116R115]:** Subgroup recommends moving this definition to VM-01, which is now included at the end of the draft document.

~~has the potential to produce a contractual total amount payable on such death that exceeds the account value, or~~

~~in the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.~~

E. Materiality

The company shall establish a standard containing the criteria for determining whether an assumption, risk factor, or other element of the principle-based valuation has a material impact on the size of the reserve. This standard shall be applied when identifying material risks.

Section 2: Scope and Effective Date

A. Scope

Subject to the requirements of this Sections 1 to 13 of VM-22 are annuity contracts, certificates and contract features, whether group or individual, including both life contingent and term-certain-only, directly written or assumed through reinsurance issued on or after 1/1/2024, with the exception of contracts or benefits listed below.

Products out of scope include:

1. ~~Contracts or benefits that are subject to VM 21 (such as variable annuities, RILAs, buffer annuities, and structured annuities)~~
2. GICs
3. Synthetic GICs
4. Stable Value Contracts
5. Funding Agreements

Products in scope of VM-22 include ~~non-variable~~ fixed annuities which consist of, but are not limited to, the following ~~the~~ list:

- **Account Value Based Annuities**
  1. Deferred Annuities (SPDA & FPDA)
  2. Multi-Year Guarantee Annuities (MYGA)
  3. Fixed Indexed Annuities (FIA)
  4. Market Value Adjustments (MVA)
  5. Two-tiered Annuities
  6. Guarantees/Benefits/Riders on ~~Non-Variable~~ Fixed Annuity Contracts
- **Payout Annuities**
  1. Single Premium Immediate Annuities (SPIA)
  2. Deferred Income Annuities (DIA)
  3. Term Certain Payout Annuities
  4. Pension Risk Transfer Annuities (PRT)
  5. Structured Settlement Contracts (SSC)
  6. Longevity Reinsurance

Commented [X117]: Add consistent with VM-21 Section 1.E, which was added to the 2022 VM.

Commented [VM22118R117]: Edits to address this comment will be reflected in next exposure

Commented [X119]: Consistent with our comment in Section 1, the language around effective date should be clear this only applies to new PBR methodology, and rates in Section 13 have a different effective date.

Commented [VM22120R119]: Edits to address this comment will be reflected in next exposure

Commented [X121]: We would support reworking this section to rely on principles, rather than definitions to determine what is in and out of scope. As product ... [27]

Commented [VM22122R121]: ACLI will follow up ... [28]

Commented [X123]: The reserving categories for ... [26]

Commented [VM22124R123]: See NY comment ... [25]

Commented [VM22125R123]: See Equitable com ... [24]

Commented [VM22126R123]: The VM-22 Subgr ... [23]

Commented [CD127]: suggest numbering the par ... [30]

Commented [VM22128R127]: Edits to address t ... [29]

Commented [CD129]: suggest swapping the orde ... [31]

Commented [VM22130R129]: Edits to address t ... [32]

Commented [X131]: Since buffer annuities are a s ... [33]

Commented [VM22132R131]: Edits to address t ... [34]

Commented [CD133]: this is not defined in the De ... [35]

Commented [VM22134R133]: Edits to address t ... [36]

Commented [X135]: This needs to be revised to b ... [37]

Commented [VM22136R135]: Edits to address t ... [38]

Commented [CD137]: should this be "non-variabl ... [39]

Commented [VM22138R137]: Edits to address t ... [40]

Commented [X139]: Typo. Delete extra "the".

Commented [VM22140R139]: Edits to address t ... [42]

Commented [CD141]: grammar - delete "the"

Commented [VM22142R141]: Edits to address t ... [41]

Commented [CD143]: should have space instead of dash

Commented [VM22144R143]: Edits to address t ... [43]

Commented [CD145]: delete the "s" and add "Annuities"

Commented [VM22146R145]: Edits to address t ... [44]

Commented [CD147]: should this be "Non-Variabl ... [45]

Commented [VM22148R147]: Edits to address t ... [46]

Commented [CD149]: for consistency, make plur ... [47]

Commented [VM22150R149]: Edits to address t ... [48]

Products out of scope include:

1. Contracts or benefits that are subject to VM-21 (such as variable annuities and RILAs)
2. GICs
3. Synthetic GICs
4. Stable Value Contracts
5. Funding Agreements

~~The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22.~~

B. Effective Date & Transition

Effective Date

These requirements apply for valuation dates on or after January 1, ~~2024~~2025.

**Transition**

A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for business otherwise subject to VM-22 PBR requirements and issued during the first three years following the effective date of VM-22 PBR. ~~If a company during the three-year transition period elects to apply VM-22 PBR to a block of such business, then a company must continue to apply the requirements of VM-22 PBR for future issues of this business. Irrespective of the transition date, a company shall apply VM-22 PBR requirements to applicable blocks of business on a prospective basis starting at least three years after the effective date.~~

**Commented [X151]:** We suggest moving or deleting the sentence "The company may elect to exclude one or more groups of contracts from the stochastic reserve calculation in certain situations, pursuant to the exclusion test requirements defined in Section 3.E of VM-22." from this section as it does not seem fitting here.

**Commented [VM22152R151]:** Edits to address this comment will be reflected in next exposure

**Commented [CD153]:** self-referencing "VM-22" is not necessary

**Commented [VM22154R153]:** Edits to address this comment will be reflected in next exposure

**Commented [X155]:** Does this belong in Scope? Do these still follow the other VM-22 requirements (if the old VM-22 interest rate determinations are left in the same chapter as the VM-22 PBR requirements)?

it is normal to then list what requirements such excluded contracts would follow. However, the statement here is more problematic because you can be excluded from the SR but still subject to VM-22.

**Commented [VM22156R155]:** Edits to address this comment will be reflected in next exposure

**Commented [CD157]:** again, suggest numbering the paragraphs within this section

**Commented [VM22158R157]:** Edits to address this comment will be reflected in next exposure

**Commented [X159]:** We still have a question about whether RBC factors are still at an appropriate level, if principles-based capital is not developed. Were they set assuming that this reserve was at a CTE(70) level in the first place, or were they dependent on the prior framework?

**Commented [VM22160R159]:** Comment related to RBC

**Commented [X161]:** Need to clarify what is meant by "VM-22 PBR Requirements". Add specific section ... [49]

**Commented [VM22162R161]:** Subgroup discussed moving current VM-22 requirements (currently Secti... [50]

**Commented [X163]:** To be more clear, recommend adding "transition period" to "the three years".

**Commented [VM22164R163]:** Edits to address this comment will be reflected in next exposure

**Commented [X165]:** Can a company wait until the end of the transition period to start PBR, but then apply PBR ... [51]

**Commented [VM22166R165]:** Discussed with Subgroup and decided to keep the VM-22 language silent on th... [54]

**Commented [CD167]:** Will we (or should we) allow for any early adopters (like we did for VM-21)? It would ... [53]

**Commented [VM22168R167]:** Discussed with Subgroup and decided to not have early adoption before the st... [52]

Section 3: Reserve Methodology

A. Aggregate Reserve

The aggregate reserve for contracts falling within the scope of these requirements shall equal the ~~stochastic reserve~~SR (following the requirements of Section 4) ~~plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option,~~ less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A and VM-C.

**Guidance Note:** Contracts valued under applicable requirements in VM-A and VM-C are ones that pass the exclusion test and elect to not model PBR ~~stochastic reserves~~SRs, per the requirements in Section 3.E.

B. Impact of Reinsurance ~~Ceded~~

All components in the aggregate reserve shall be determined post-reinsurance ceded, that is net of any reinsurance cash flows arising from treaties that meet the statutory requirements that allow the treaty to be accounted for as reinsurance. A pre-reinsurance ceded reserve also needs to be determined by ignoring all reinsurance cash flows (costs and benefits) in the reserve calculation.

~~C. To Be Determined~~The Additional Standard Projection Amount

D. The Stochastic Reserve

~~The stochastic reserve~~  
 The additional standard projection amount is determined by applying one of the two standard projection methods defined in Section 6. The same method must be used for all contracts within a group of contracts that are aggregated together to determine the reserve. The company shall elect which method they will use to determine the additional standard projection amount. ~~The company may not change that election for a future valuation without the approval of the domiciliary commissioner.~~

D. The SR

1. ~~The SR~~ shall be determined based on asset and liability projections for the contracts falling within the scope of these requirements, excluding those contracts valued using the methodology pursuant to applicable requirements in VM-A and VM-C, over a broad range of stochastically generated projection scenarios described in Section 8 and using prudent estimate assumptions as required in Section 3.GF herein.
2. ~~The stochastic reserve~~SR amount for any group of contracts shall be determined as CTE70 of the scenario reserves following the requirements of Section 4.

E. The DR

~~, with the exception of~~The DR for groups of contracts for which a company elects the Deterministic Certification Option in Section 7.E, ~~which shall be determined as the scenario reserve~~DR following the requirements of Section 4.

Commented [X169]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22170R169]: To address SPA later in the VM-22 development process.

Commented [X171]: One of the most confused parts of the draft was referring to a DR as the SR for certain contracts. Need to handle and refer to separately.

Commented [VM22172R171]: Edits to address this comment will be reflected in next exposure

Commented [X173]: Guidance is needed on how a pre-reinsurance reserve is to be determined.

Commented [VM22174R173]: ACLI will consider whether to provide suggested language to clarify pre-reinsurance cash flow requirements in response to the next exposure

Commented [X175]: Reinstate and modify later as needed - SPA being developed in separate workflow.

Commented [VM22176R175]: Edits to address this comment will be reflected in next exposure

Commented [CD177]: Should this be Section 3.G?

Commented [VM22178R177]: Edits to address this comment will be reflected in next exposure

Commented [X179]: Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

Commented [VM22180R179]: Will replace "scenario reserve" with "deterministic reserve".

3. The reserve may be determined in aggregate across various groups of contracts within each Reserving Category as a single model segment when determining the stochastic reserve if the business and risks are not managed separately or are part of the same integrated risk management program. Aggregation is permitted if a resulting group of contracts (or model segment) follows the listed principles:SR.

#### F. Aggregation of Contracts for the DR and SR

Groups of contracts within different Reserving Categories may not be aggregated together in determining the SR or DR. For the purposes of VM-22, Reserving Categories are classified as the following:

- a. The “Payout Annuity Reserving Category” includes the following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits provided by variable annuities:
  - i. Immediate annuity contracts;
  - ii. Deferred income annuity contracts;
  - iii. Structured settlements in payout or deferred status;
  - iv. Fixed income payment streams resulting from the exercise of settlement options or annuitizations of host contracts issued;
  - v. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest);
  - vi. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts, once the contract funds are exhausted;
  - vii. Certificates, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders fixed income payment streams upon their retirement; and
  - viii. Pension Risk Transfer Annuities; and
  - ix. Longevity Reinsurance.

**Drafting Note:** Additional feedback is welcome for whether to permit optionality for categorizing guaranteed living benefit contracts with depleted fund value as either in the payout or accumulation reserving category.

**Commented [VM22181]:** include in deferred annuity with depleted fund value in payout reserving category or accumulation reserving category.

**Commented [VM22182R181]:** The Subgroup has elected to leave these contracts in the payout annuity reserving category, but is adding to a drafting note to welcome feedback.

b. The “Accumulation Reserving Category” are all annuities within scope of VM-22 under Section II of the NAIC Valuation Manual that are not in the “Payout Reserving Category”.

b.—  
 Using prudent actuarial judgement, consider the following elements when aggregating groups of contracts: whether groups of contracts are part of the same portfolio (or different portfolios that interact), same integrated risk management system, administered/managed together

4. Do not aggregate groups of contracts for which the company elects to use the Deterministic Certification Option in Section 7.E with any groups of contracts that do not use such option.

54.— To the extent that these limits on the aggregation result results in more than one model segment, the stochastic reserve SR aggregate reserve shall equal the sum of the stochastic reserve SR amounts computed for each model segment and scenario reserve DR amounts computed for each model segment for which the company elects to use the Deterministic Certification Option in Section 7.E.

G. Stochastic Exclusion Test

1. To the extent that certain groups of contracts pass one of the defined the stochastic exclusion tests in Section 7.B, these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A and VM-C, with the statutory maximum valuation rate for immediate annuities specified in and Section 13.

a. **Guidance Note:** The intention of contracts that pass the stochastic exclusion test is to provide the option to value contracts under VM-A and VM-C. This may apply to pre-PBR CARVM requirements in accordance with Actuarial Guideline XXXIII (AG33) methodology with type A, B, C rates for SPIAs issued before 2018; AG33 methodology with pre-PBR VM 22 rates for SPIAs issued on/after 2018; Actuarial Guideline XXXV (AG35) pre-PBR methodology for Fixed Indexed Annuities; and AG33 methodology (with interest rate updates for modernization initiatives on new contracts) for non-SPIAs.

2. For dividend-paying contracts, a dividend liability shall be established following requirements in VM-A and VM-C, as described above, for the base contract.

2.3. The approach for grouping contracts company may not group together contract types with significantly different risk profiles when performing the exclusion tests should follow the same principles that underlie the aggregation approach for model segments discussed for Stochastic Reserves in Section D above test.

H. Allocation of the Aggregate Reserve to Contracts

The aggregate reserve shall be allocated to the contracts falling within the scope of these requirements using the method outlined in Section 4.13, with the exception of contract following Section 3.E which are to be calculated on a seriatim basis.

I. Prudent Estimate Assumptions

1. With respect to the Stochastic Reserve SR in Section 3.D, the company shall establish the prudent estimate assumption for each risk factor in compliance with the requirements

**Commented [X183]:** The term "Deterministic Certification Option" may be confusing, as there is no "deterministic" reserve, unlike VM-20. We recommend consideration of an alternative term. In addition, we recommend changing the phrasing to "with the exception of groups of contracts for which a company elects the [Deterministic Certification Option], following the requirements of Section 7.E."

**Commented [VM22184R183]:** Now that deterministic reserve exists, the ACLI is fine retaining "Deterministic Certification Option"

**Commented [X185]:** Recommend replacing "the scenario reserve" with "the deterministic reserve". Note that we also disagree with calling the deterministic reserve a stochastic reserve (later in draft), which adds a good deal of confusion.

**Commented [VM22186R185]:** Will replace "scenario reserve" with "deterministic reserve".

**Commented [CD187]:** suggest expanding header ... [55]

**Commented [VM22188R187]:** No objections from ... [56]

**Commented [X189]:** Seems to imply that only SPI ... [57]

**Commented [VM22190R189]:** Edits to address t ... [58]

**Commented [CD191]:** Suggest rewording to just s ... [59]

**Commented [VM22192R191]:** Edits to address t ... [60]

**Commented [X193]:** We believe this guidance not ... [61]

**Commented [VM22194R193]:** No objections to ... [62]

**Commented [X195]:** The statement in this sectio ... [63]

**Commented [VM22196R195]:** Subgroup agreed ... [64]

**Commented [X197]:** This section seems to indu ... [65]

**Commented [VM22198R197]:** Subgroup voted t ... [66]

**Commented [CD199]:** for clarity, change this refe ... [67]

**Commented [VM22200R199]:** Edits to address t ... [68]

**Commented [CD201]:** again, suggest rewording t ... [69]

**Commented [VM22202R201]:** Edits to address t ... [70]

**Commented [X203]:** Based on VM-20 language.

**Commented [VM22204R203]:** Subgroup agreed ... [71]

**Commented [X205]:** Either in this item or in Secti ... [72]

**Commented [VM22206R205]:** Edits to address t ... [73]

**Commented [X207]:** This sub-section seems more ... [74]

**Commented [VM22208R207]:** The Subgroup dec ... [75]

**Commented [CD209]:** VM-21 Section 3.H on ... [76]

**Commented [VM22210R209]:** Subgroup decided ... [77]

**Commented [CD211]:** should this be "Section 3.D"?

**Commented [VM22212R211]:** Edits to address t ... [78]

in Section 12 of Model #820 and must periodically ~~at least every 3 years~~ review and update the assumptions as appropriate in accordance with these requirements.

**Drafting Note:** Consider replacing “periodically” with “at least every 3 years in the paragraph above upon adoption of a similar APF for VM-20/VM-21.

~~2.~~ The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. ~~If the results of statistical testing or other testing~~ the review indicate that previously anticipated experience for a given factor is inadequate, then the ~~qualified actuary~~ Company shall set a new, adequate, anticipated experience assumption for the factor.

~~2.3.~~ To determine the prudent estimate assumptions, the ~~stochastic reserve~~ SR shall also follow the requirements in Sections 4 and ~~general assumptions including~~ Section 9 for asset assumptions, Section 10 for ~~contract policy holder~~ behavior assumptions, and Section 11 for mortality assumptions, and Section 12 for general guidance and expense assumptions.

J. Approximations, Simplifications, and Modeling Efficiency Techniques

A company may use simplifications, approximations, and modeling efficiency techniques to calculate the SR and/or the additional standard projection amount required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations, and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.

**Guidance Note:**

Examples of modeling efficiency techniques include, but are not limited to:

1. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters.
2. Generating a smaller liability or asset model to represent the full seriatim model using grouping compression techniques or other similar simplifications.

There are multiple ways of providing the demonstration required by Section 3.H. The complexity of the demonstration depends upon the simplifications, approximations or modeling efficiency techniques used. Examples include, but are not limited to:

1. Rounding at a transactional level in a direction that is clearly and consistently conservative or is clearly and consistently unbiased with an obviously immaterial impact on the result (e.g., rounding to the nearest dollar) would satisfy 3.H without needing a demonstration. However, rounding to too few significant digits relative to the quantity being rounded, even in an unbiased way, may be material and in that event, the company may need to provide a demonstration that the rounding would not produce a material understatement of the reserve.

**Commented [X213]:** Recommend to periodically review at least every three years.

**Commented [VM22214R213]:** Subgroup decided to adopt this wording if a similar APF is adopted for VM-20/VM-21.

**Commented [CD215]:** Should this be “the company... shall”, rather than the “qualified actuary... shall”? Not sure why this particular task falls on the QA, when “the company” generally has responsibility for PBR and, in the subsection directly before this one, the company is assigned the task of establishing prudent estimate assumptions.

**Commented [VM22216R215]:** Edits to address this comment will be reflected in next exposure

**Commented [X217]:** Suggest replacing “If the results of statistical testing or other testing” with “If the results of the review” to simplify language and avoid possible confusion.

**Commented [VM22218R217]:** Edits to address this comment will be reflected in next exposure

**Commented [X219]:** Recommend replacing “the qualified actuary” with “the Company” consistent with general PBR requirements that the company set assumptions.

**Commented [VM22220R219]:** Edits to address this comment will be reflected in next exposure

**Commented [CD221]:** should this be “the company”? See prior comment.

**Commented [VM22222R221]:** Edits to address this comment will be reflected in next exposure

**Commented [CD223]:** should this be “contract holder”?

**Commented [VM22224R223]:** Edits to address this comment will be reflected in next exposure

**Commented [X225]:** Need a new section for the general assumptions, including specifics for the expense assumptions. APF currently exposed for VM-21. We should be consistent with any edits.

**Commented [VM22226R225]:** Edits to address this comment will be reflected in next exposure



2. A brute force demonstration involves calculating the minimum reserve both with and without the simplification, approximation or modeling efficiency technique, and making a direct comparison between the resulting reserve. Regardless of the specific simplification, approximation or modeling efficiency technique used, brute force demonstrations always satisfy the requirements of Section 3.H.

3. Choosing a reduced set of scenarios from a larger set consistent with prescribed models and parameters and providing a detailed demonstration of why it did not understate the reserve by a material amount and the expected value of the reserve would not be less than the expected value of the reserve that would otherwise be calculated. This demonstration may be a theoretical, statistical or mathematical argument establishing, to the satisfaction of the insurance commissioner, general bounds on the potential deviation in the reserve estimate rather than a brute force demonstration.

~~Justify the use of randomly sampling withdrawal ages for each contract instead of following the exact prescribed WDCM method by demonstrating that the random sampling method is materially equivalent to the exact prescribed approach, and the simplification does not materially reduce the Additional Standard Projection Amount and the final reported reserve. In particular, the company should demonstrate that the statistical variability of the results based on the random sampling approach is immaterial by testing different random sets, e.g., if randomly selecting a withdrawal age for each contract, the probability distribution of the withdrawal age should be stable and not vary significantly when using different random number sets.~~

**Drafting Note:** Add back in the WDCM method example in the above guidance note if VM-22 uses this method for the SPA calculation.

**Commented [X227]:** Specific example should be tailored based on the SPA developed.

**Commented [VM22228R227]:** Delete for now and add back in if the WDCM method is used for the VM-22 SPA calculation.

**Commented [X229]:** Added consistent with VM-21 Section 3.H, which was added to the 2022 VM.

**Commented [VM22230R229]:** Edits to address this comment will be reflected in next exposure

Section 4: Determination of Stochastic Reserve SR

A. Projection of Accumulated Deficiencies

1. General Description of Projection

The projection of accumulated deficiencies shall be made ignoring federal income tax in both cash flows and discount rates, and it shall reflect the dynamics of the expected cash flows for the entire group of contracts, reflecting all product features, including any guarantees provided under the contracts using prudent estimate liability assumptions defined in Sections 10 and 11 and asset assumptions defined in Sections 4 and 9.D. The company shall project cash flows including the following:

a. ~~Revenues~~ Gross premium received by the company including gross premiums received from the ~~policyholder~~ policyholder/contract holder (including any due premiums as of the projected start date).

**Guidance Note:** If due premiums are modeled, the final reported reserve needs to be adjusted by adding the due premium asset.

b. Other revenues, including contractual fees and charges, and revenue-sharing income received by the company (net of applicable expenses).

c. All material benefits projected to be paid to ~~contract~~ policyholders including, but not limited to, death claims, surrender benefits and withdrawal benefits—reflecting the impact of all guarantees and adjusted to take into account amounts projected to be charged to account values on general account business. Any guarantees, in addition to market value adjustments assessed on projected withdrawals or surrenders, shall be taken into account.

**Guidance Note:** Amounts charged to account values on general account business are not revenue; examples include rider charges and expense charges.

d. Non-Guaranteed Elements (NGE) cash flows as described in Section 10.I.

e. Insurance company expenses (including overhead and investment maintenance expense), commissions, contractual fees and charges, and revenue sharing income received by the company (net of applicable expenses), other acquisition expenses associated with business in force as of the valuation date.

f. Net Cash flows associated with any reinsurance.

g. Cash flows from hedging instruments as described in Section 4.A.4.

**Commented [NJ231]:** Consider including stochastic mortality in the SR for longevity reinsurance

**Commented [VM22232R231]:** Ported over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk for reinsurance liability assumptions. New language is included in Section 5.A.2.e, including a guidance note that explicitly mentions longevity reinsurance.

**Commented [CD233]:** Should this refer to Section 4 and Section 9?

**Commented [VM22234R233]:** Edits to address this comment will be reflected in next exposure

**Commented [CD235]:** "contract holder"?

**Commented [VM22236R235]:** Edits to address this comment will be reflected in next exposure

**Commented [X237]:** If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below. ... [79]

**Commented [VM22238R237]:** Edits to address this comment will be reflected in next exposure

**Commented [CD239]:** "contract holders"

**Commented [VM22240R239]:** Edits to address this comment will be reflected in next exposure

**Commented [X241]:** The purpose of this guidance note is not clear as these charges would be reflected in the ... [80]

**Commented [VM22242R241]:** Edits to address this comment will be reflected in next exposure

**Commented [CD243]:** should this be Section 10.I?

**Commented [VM22244R243]:** Edits to address this comment will be reflected in next exposure

**Commented [X245]:** Changed investment expense to be maintenance expense so that it does not repeat what ... [81]

**Commented [VM22246R245]:** Edits to address this comment will be reflected in next exposure

**Commented [X247]:** Added acquisition expenses.

**Commented [VM22248R247]:** Edits to address this comment will be reflected in next exposure

**Commented [X249]:** Take out the revenues that covers the investment expenses and added a separate bullet ... [82]

**Commented [VM22250R249]:** Edits to address this comment will be reflected in next exposure

**Commented [CD251]:** Both net and gross cash flows have to be considered, so I don't agree with the addi ... [83]

**Commented [VM22252R251]:** Edits to address this comment will be reflected in next exposure

e.h. Cash receipts or disbursements associated with invested assets (other than policy loans) as described in Section 4.D.4, including investment income, realized capital gains and losses, principal repayments, asset default costs, investment expenses, asset prepayments, and asset sales.

f.i. If modeled explicitly, cash flows related to policy loans as described in Section 10.I.2, including interest income, new loan payments and principal repayments.

**Guidance Note:** Future net policy loan cash flows include: policy loan interest paid in cash plus repayments of policy loan principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.1.b are before consideration of policy loans), less additional policy loan principal (but excluding policy loan interest that is added to the policy loan principal balance).

Guidance Note: Section 4.A.1 requires market value adjustments (MVAs) on liability cash flows to be reflected because in a cash flow model, assets are assumed to be liquidated at market value to cover the cash outflow of the cash surrender; therefore, inclusion of the market value adjustment aligns the asset and liability cash flows. This may differ from the treatment of MVAs in the definition of cash surrender value (Section 1.D), which defines the statutory reserve floor for which the values must be aligned with the annual statement value of the assets.

**Commented [X253]:** Guidance Note regarding the market value adjustment seems still applies and should not be deleted. We reinstated the guidance note.

## 2. Grouping of Index Crediting Strategies

Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy. In assigning each index crediting strategy to a grouping for projection purposes, the fundamental characteristics of the index crediting strategy shall be reflected, and the parameters shall have the appropriate relationship to the stochastically generated projection scenarios described in Section 8. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

**Commented [X254]:** Suggest editing the first sentence to note scope is FIAs and to avoid confusion regarding the term "investment guideline" as follows: "Index crediting strategies for fixed indexed annuities may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of each index crediting strategy."

**Commented [VM22255R254]:** Edits to address this comment will be reflected in next exposure

Index accounts sharing similar index crediting strategies may also be grouped for modeling to an appropriately crafted proxy strategy normally expressed as a linear combination of recognized market indices, sub-indices or funds, in order to develop the investment return paths and associated interest crediting. Each index crediting strategy's specific risk characteristics, associated index parameters, and relationship to the stochastically generated scenarios in Section 8 should be considered before grouping or assigning to a proxy strategy. Grouping and/or development of a proxy strategy may not be done in a manner that intentionally understates the resulting reserve.

## 3. Model Cells

Projections may be performed for each contract in force on the date of valuation or by assigning contracts into representative cells of model plans using all characteristics and criteria having a material impact on the size of the reserve. Assigning contracts to model cells may not be done in a manner that intentionally understates the resulting reserve.

4. Modeling of Hedges

- a. For a company that does not have a future hedging program tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:
  - i. The company shall not consider the cash flows from any future hedge purchases or any rebalancing of existing hedge assets in its modeling.
  - ii. Existing hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the starting assets. ~~The hedge assets may then be considered in one of two ways:~~
    - a) ~~Include the asset cash flows from any contractual payments and maturity values in the projection model; or~~
    - b) ~~No hedge positions in which case the hedge positions held on the valuation date are replaced with cash and/or other general account assets in an amount equal to the aggregate market value of these hedge positions.~~

**Guidance Note:** If the hedge positions held on the valuation date are replaced with cash, then as with any other cash, such amounts may then be invested following the company's investment strategy.

A company may switch from method a) to method b) at any time, but it may only change from b) to a) with the approval of the domiciliary commissioner.

- b. For a company that has a future hedging program tied directly to supporting the contracts falling under the scope of VM-22 stochastic reserve SR requirements:
  - i. For a hedging program with hedge payoffs that offset interest credits associated with indexed interest strategies (indexed interest credits):
    - a) In modeling cash flows, the company shall include the cash flows from future hedge purchases or any rebalancing of existing hedge assets that are intended solely to offset interest credits to ~~policyholders~~ contract holders.
    - b) Existing hedging instruments that are currently held by the company for this purpose offsetting the indexed credits in support of the contracts falling under the scope of these requirements shall be included in the starting assets. Existing hedging instruments that are currently held by the company not for any other purpose offsetting the indexed credits should be modeled consistently with the requirements of Section 4.A.4.a.ii.
    - c) An Index Credit Hedge Margin for these hedge instruments shall be reflected by reducing index interest credit hedge payoffs by a margin multiple that shall be justified by sufficient and credible

**Commented [X256]:** Given that Section 9 covers hedging, we would suggest considering moving parts of Section 4.A.4 to that section.

**Commented [X257]:** VM-22 took out the CDHS requirement and replaced it with "future hedging program". Future hedging should not materially reduce reserves or TAR if it is not well documented. The hedging DG is currently working on this for VM-20/VM-21. We will work with VM-22 subgroup to edit VM-22 accordingly.

**Commented [X258]:** Suggest rewording "Future hedging program" to "hedging program with future transactions" to avoid ambiguity.

**Commented [CD259]:** The word "future" to describe the "hedging program" here is confusing. What about current hedging programs with expected future hedge purchases? Why not just say "hedging program"? Also, I wanted to note that removing the concept of CDHS creates inconsistency with both VM-20 and VM-21. Why not retain it?

**Commented [CD260]:** same comment as above, about the word "future" being confusing

**Commented [CD261]:** "contract holders"

**Commented [VM22262R261]:** Edits to address this comment will be reflected in next exposure

**Commented [X263]:** "Any other purpose" in the last sentence seems overly broad and should be narrowed.

**Commented [VM22264R263]:** Edits to address this comment will be reflected in next exposure

**Commented [X265]:** Specify "for this purpose" as "for offsetting the indexed credits", specify "for any other purposes" as "not for offsetting the indexed credits".

**Commented [VM22266R265]:** Edits to address this comment will be reflected in next exposure

**Commented [X267]:** We believe the company should determine the appropriate margin based on the demonstration of effectiveness. Any guardrails on these undetermined values should be minimal, including as low as 0, subject to the appropriate demonstration of effectiveness. Further, we believe that documentation of effective product management should be contemplated in addition to historical effectiveness.

**Commented [VM22268R267]:** Subgroup agreed to revisit this discussion after field testing.

**Commented [CD269]:** clarify verbiage by saying "hedge instruments" or "derivative instruments"

**Commented [VM22270R269]:** Edits to address this comment will be reflected in next exposure

company experience and be no less than [X%] multiplicatively of the interest credited. In the absence of sufficient and credible company experience, a margin of [Y%] shall be assumed. There is no cap on the index credit hedge margin if company experience indicates actual error is greater than [Y%]. It is permissible to substitute stress-testing for sufficient and credible experience if such stress-testing comprehensively considers a robust range of future market conditions.

- ii. For a company that hedges any contractual obligation or risks other than indexed interest credits, the detailed requirements for the modeling of hedges are defined in Section 9. The following requirements do not supersede the detailed requirements.
  - a) The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the projections used in the determination of the ~~stochastic reserve~~ SR.
  - b) The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future. Because models do not always accurately portray the results of hedge programs, the company shall, through back-testing and other means, assess the accuracy of the hedge modeling. The company shall determine a ~~stochastic reserve~~ SR as the weighted average of two CTE values; first, a CTE70 (“best efforts”) representing the company’s projection of all of the hedge cash flows, including future hedge purchases, and a second CTE70 (“adjusted”) which shall use only hedge assets held by the company on the valuation date and only future hedge purchases associated with indexed interest credited. These are discussed in greater detail in Section 9.
  - c) ~~Consistent with Section 4.A.4.b.i., if the company has an indexed credit hedging program, the index credit hedge margin for instruments associated with indexed interest credited shall be reflected by reducing hedge payoffs by a margin multiple as defined in Section 4.A.4.b.i.c): in both the “best efforts” run and the “adjusted” run.~~
  - d) The use of products not falling under the scope of ~~these~~ VM-22 PBR Section 1 through 13 requirements (e.g., variable annuities) ~~(e.g., equity indexed annuities)~~ as a hedge shall not be recognized in the determination of accumulated deficiencies.

**Guidance Note:** Section 4.A.4.b.i is intended to address common situations for products with index crediting strategies where the company only hedges index credits or clearly separates index credit hedging from other hedging. In this case the hedge positions are considered similarly to other

**Commented [X271]:** It is not clear how the stress testing can be used to support the index credit hedge margin. It is a test of the modeled strategy not actual performance and does not reflect any model error. We suggest that both back testing and stress testing be required and elaborated further:  
 Clearly specify method and metrics used for the back testing with focus on all available recent relevant history, not limited to 12 months  
 Recommend defined stress periods for stress testing, e.g., 2008 financial crisis, 2020 COVID impaired market conditions.

**Commented [X272R271]:** We will repeat the comment from our first letter: “Regarding hedge breakage expense assumptions, are both sources of error reflected here - error in the hedging itself, and error in the ability to accurately model it? Should we be separately considering the two limitations to make sure they are both clear: 1) the real-world hedging error and 2) the modeling error in reflecting the future hedging? Current error factor discussions seem muddled.”

**Commented [X273]:** Again, need to coordinate with Hedging DG.

**Commented [X274]:** Margins are discussed in a different section, so recommend deleting.

**Commented [X275]:** Edits were made to provide context and clarification for the requirements.

**Commented [VM22276R275]:** Edits to address this comment will be reflected in next exposure

**Commented [X277]:** Clarify that “these requirements” should be specified as “VM-22 PBR requirements”. Again, we suggest reconsidering the use of “VM-23”, though.

**Commented [VM22278R277]:** Edits to address this comment will be reflected in next exposure

**Commented [CD279]:** it might be helpful to keep the parenthetical statement, with “variable annuities” as the example

**Commented [VM22280R279]:** Edits to address this comment will be reflected in next exposure

fixed income assets supporting the contracts, and a margin is reflected rather than modeling using a CTE70 adjusted run with no future hedge purchases. If a company has a more comprehensive hedge strategy combining index credits, guaranteed benefit, and other risks (e.g., full fair value or economic hedging), an appropriate and documented bifurcation method should be used in the application of sections 4.A.4.b.i and 4.A.4.b.ii above for the hedge modeling and justification. Such bifurcation methods may quantify the specific risk exposure attributable to index credit liabilities versus other liabilities such as guaranteed living benefits, and apply such for the basis for allocation.

**Guidance Note:** The requirements of Section 4.A.4 govern the determination of reserves for annuity contracts and do not supersede any statutes, laws or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

5. Revenue Sharing

If applicable, projections of accumulated deficiencies may include income from projected future revenue sharing, net of applicable projected expenses (net revenue-sharing income) if each of the following requirements are met:

**Commented [X281]:** Unclear why Revenue Sharing is considered for non-variable products, can probably delete.

6. Length of Projections

Projections of accumulated deficiencies shall be run for as many future years as needed so that no materially greater reserve value would result from longer projection periods. Obligations remain at the end of the projection periods. Company can choose to run a shorter projection period but not shorter than 20 years and include the present value of the terminal benefits and expenses in the accumulated deficiency calculation.

**Commented [X282]:** Clarify that for revenue sharing, the entire subsection of VM-21 Section 4.A.5 applies.

**Commented [VM22283R282]:** Edits to address this comment will be reflected in next exposure

**Commented [CD284]:** The "requirements are met" list is only in Section 4.A.5.a. Was the intent also to define the amount of net revenue-sharing income allowed in the projections? If so, will need to add verbiage to reference VM-21 Section 4.A.5.a through 4.A.5.f.

**Commented [VM22285R284]:** Edits to address this comment will be reflected in next exposure

7. Interest Maintenance Reserve (IMR)

The IMR shall be handled consistently with the treatment in the company's cash flow testing, and the amounts should be adjusted to a pre-tax basis.

**Commented [X286]:** We recommend that the projection period requirement be in line with that of VM-20. Instead of meeting the immateriality requirement, calculate the present value of the terminal benefits and expenses and include it in the accumulated deficiency calculation.

**Commented [VM22287]:** See Bill Wilton's comment letter, expressing opposition to inclusion of pre-tax IMR.

B. Determination of Scenario Reserve

1. For a given scenario, the scenario reserve shall be determined using one of two methods described below:

**Commented [CD288]:** should we consider these changes to VM-21 as well, for consistency?

a) The starting asset amount plus the greatest present value, as of the projection start date, of the projected accumulated deficiencies; or

**Commented [VM22289R288]:** Edits to address this comment will be reflected in next exposure

**Guidance Note:** The greatest present value of accumulated deficiencies can be negative.

**Commented [X290]:** Section does not specify what the reserve floor shall be (if any) for contracts without cash surrender value.

b) The direct iteration method, where the scenario reserve is determined by solving for the amount of starting assets which, when projected along with all contract cash flows, result in the defeasement of all projected future benefits and expenses at the end of the projection horizon with no positive accumulated deficiencies at the end of any projection year during the projection period.

**Commented [VM22291R290]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

The scenario reserve for any given scenario shall not be less than the cash surrender value with market value adjustment in aggregate on the valuation date for the group of contracts modeled in the projection.

2. Discount Rates

In determining the scenario reserve, unless using the direct iteration method pursuant to Section 4.B.1.b, the accumulated deficiencies shall be discounted at the NAER on additional assets, as defined in Section 4.B.3.

3. Determination of NAER on Additional Invested Asset Portfolio

- a. The additional invested asset portfolio for a scenario is a portfolio of general account assets as of the valuation date, outside of the starting asset portfolio, that is required in that projection scenario so that the projection would not have a positive accumulated deficiency at the end of any projection year. This portfolio may include only (i) General Account assets available to the company on the valuation date that do not constitute part of the starting asset portfolio; and (ii) cash assets.

**Guidance Note:**

Additional invested assets should be selected in a manner such that if the starting asset portfolio were revised to include the additional invested assets, the projection would not be expected to experience any positive accumulated deficiencies at the end of any projection year.

It is assumed that the accumulated deficiencies for this scenario projection are known.

b. To determine the NAER on additional invested assets for a given scenario:

- i. Project the additional invested asset portfolio as of the valuation date to the end of the projection period,
- a) Investing any cash in the portfolio and reinvesting all investment proceeds using the company's investment policy.
- b) Excluding any liability cash flows.
- c) Incorporating the appropriate returns, defaults and investment expenses for the given scenario.
- ii. If the value of the projected additional invested asset portfolio does not equal or exceed the accumulated deficiencies at the end of each projection year for the scenario, increase the size of the initial additional invested asset portfolio as of the valuation date, and repeat the preceding step.
- iii. Determine a vector of annual earned rates that replicates the growth in the additional invested asset portfolio from the valuation date to the end of the

**Commented [X292]:** For products that do not have a cash surrender value, it is recommended that VM-22 use a "working reserve" concept, similar to VM-21 Section 4.1.1.1, to address the requirement. Otherwise, there will be an issue aggregating those with and without CSV.

**Commented [VM22293R292]:** Academy will work on developing a "working reserve" concept for products without cash surrender value, though the issue may be minimized given that payout annuities cannot be aggregated with accumulation annuities.

**Commented [X294]:** For products with market value adjustment, needs to be floored at cash surrender value with MVA.

**Commented [X295]:** We believe that assets held in the separate account with performance not impacting policyholder benefits should be modeled consistent with how the business is managed.

projection period for the scenario. This vector will be the NAER for the given scenario.

- iv. If the depletion of assets within the projection results in an unreasonably high negative NAER upon borrowing, the NAER may be set to the assumed cost of borrowing associated with each projected time period, in accordance with Section 4.D.3.c, as a safe harbor.

**Guidance Note:** There are multiple ways to select the additional invested asset portfolio at the valuation date. Similarly, there are multiple ways to determine the earned rate vector. The company shall be consistent in its choice of methods, from one valuation to the next.

**Commented [X296]:** The wording "unreasonably high" is not clear or appropriate. Recommend this requirement be revised as part of a holistic fix to address extreme outliers in NAER both on the low and high side to handle anomalies for all of VM-20, VM-21, and VM-22. Some upper/lower cutoffs could be used that depend on scenario returns.

**Commented [CD297]:** "unreasonably high" is not well defined. Also, do we need to consider guardrails in the case of "unreasonably high" positive NAERs, not just negative NAERs?

C. Projection Scenarios

1. Number of Scenarios

The number of scenarios for which the scenario reserve shall be computed shall be the responsibility of the company, and it shall be considered to be sufficient if any resulting understatement in the ~~stochastic reserve~~ SR, as compared with that resulting from running additional scenarios, is not material.

2. Economic Scenario Generation

Treasury Department interest rate curves, as well as investment return paths for index funds, equities, and fixed income assets shall be determined on a stochastic basis using the methodology described in Section 8. If the company uses a proprietary generator to develop scenarios, the company shall demonstrate that the resulting scenarios meet the requirements described in Section 8.

D. Projection of Assets

1. Starting Asset Amount

- a. For the projections of accumulated deficiencies, the value of assets at the start of the projection shall be set equal to the approximate value of statutory reserves at the start of the projection plus the allocated amount of PIMR attributable to the assets selected. Assets shall be valued consistently with their annual statement values. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:

- i. Any hedge instruments held in support of the contracts being valued; and
- ii. An amount of assets held in the general account equal to the approximate value of statutory reserves as of the start of the projections less the amount in (i).

- b. If the amount of initial general account assets is negative, the model should reflect a projected interest expense. General account assets chosen for use as described



above shall be selected on a consistent basis from one reserve valuation hereunder to the next.

2. Valuation of Projected Assets

For purposes of determining the projected accumulated deficiencies, the value of projected assets shall be determined in a manner consistent with their value at the start of the projection. For assets assumed to be purchased during a projection, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics. However, for derivative instruments that are used in hedging and are not assumed to be sold during a particular projection interval, the company may account for them at an amortized cost in an appropriate manner elected by the company.

**Guidance Note:** Accounting for hedge assets should recognize any methodology prescribed by a company's state of domicile.

3. General Account Assets

- a. General account assets shall be projected, net of projected defaults, using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested in a manner that is representative of and consistent with the company's investment policy, subject to the following requirements:
  - i. The final maturities and cash flow structures of assets purchased in the model, such as the patterns of gross investment income and principal repayments or a fixed or floating rate interest basis, shall be determined by the company as part of the model representation;
  - ii. The combination of price and structure for fixed income investments and derivative instruments associated with fixed income investments shall appropriately reflect the projected Treasury Department curve along the relevant scenario and the requirements for gross asset spread assumptions stated below;
  - iii. For purchases of public non-callable corporate bonds, follow the requirements defined in VM-20 Sections 7.E, 7.F and 9.F. The prescribed spreads reflect current market conditions as of the model start date and grade to long-term conditions based on historical data at the start of projection year four;
  - iv. For transactions of derivative instruments associated with fixed income investments, reflect the prescribed assumptions in VM-20 Section 9.F for interest rate swap spreads;
  - v. For purchases of other fixed income investments, if included in the ~~model~~ modeled company investment strategy, set assumed gross asset spreads over U.S. Treasuries in a manner that is consistent with, and results

Commented [X298]: This change was adopted for VM-20 and VM-21 for the 2022 VM.

Commented [VM22299R298]: Edits to address this comment will be reflected in next exposure

in reasonable relationships to, the prescribed spreads for public non-callable corporate bonds and interest rate swaps.

- b. ~~Notwithstanding the above requirements, the model aggregate reserve shall be the higher of that produced by the modeled company investment strategy and any non-prescribed asset spreads shall be adjusted as necessary so that the aggregate reserve is not less than that which would be obtained produced by substituting an alternative investment strategy in which all the fixed income reinvestment assets are have the same weighted average life (WAL) as the reinvestment assets in the modeled company investment strategy and are all public non-callable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of:~~

- i. ~~5% Treasury~~
- ii. ~~15~~  
20% PBR credit rating 3 (Aa2/AA)
- iii. ~~40~~80% PBR credit rating 6 (A2/A)
- iv. ~~40~~40% PBR credit rating 9 (Baa/BBB)

- c. Any disinvestment shall be modeled in a manner that is consistent with the company's investment policy and that reflects the company's cost of borrowing where applicable, provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period, taking into account duration, ratings, and other attributes of the borrowing mechanism. Gross asset spreads used in computing market values of assets sold in the model shall be consistent with, but not necessarily the same as, the gross asset spreads in Section 4.D.4.a.iii and Section 4.D.4.a.iv, recognizing that initial assets that mature during the projection may have different characteristics than modeled reinvestment assets.

**Guidance Note:** This limitation is being referred to Life Actuarial (A) Task Force for review. The simple language above "provided that the assumed cost of borrowing is not lower than the rate at which positive cash flows are reinvested in the same time period" is not intended to impose a literal requirement. It is intended to reflect a general concept to prevent excessively optimistic borrowing assumptions. It is recognized that borrowing parameters and rules can be complicated, such that modeling limitations may not allow for literal compliance, in every time step, as long as the reserve is not materially affected. However, if the company is unable to fully apply this restriction, prudence dictates that a company shall not allow borrowing assumptions to materially reduce the reserve.

4. Cash Flows from Invested Assets

- a. Cash flows from general account fixed income assets, including starting and reinvestment assets, shall be reflected in the projection as follows:

**Commented [CD300]:** should this be "stochastic reserve", since this is within Section 4: Determination of Stochastic Reserve

**Commented [VM22301R300]:** Edits to address this comment will be reflected in next exposure

**Commented [X302]:** This change was adopted for VM-20 and VM-21 for the 2022 VM.

**Commented [VM22303R302]:** Edits to address this comment will be reflected in next exposure

**Commented [CD304]:** Suggest making this plural ("Treasures") to be consistent with Section 13.B.9

**Commented [VM22305R304]:** Edits to address this comment will be reflected in next exposure

**Commented [X306]:** The proposed reinvestment mix comes from a different assumption context in current VM-22, i.e., it is designed to calculate the maximum allowed valuation interest rates, while the reinvestment mix for VM-22 PBR draft is to put a guardrail around the fixed income reinvestment assets. A guardrail is not intended to identify outliers and should not be tied to an average. The biggest concern is with the higher allocation percentage in BBB assets. The valuation manual should build an appropriate level of conservatism in the valuation standards instead of reflecting industry trends. By moving from VM-20 and VM-21 required mix of 50%/50% AA/A to the proposed mix, the gross spreads increased by 20-30 bps for almost all WAL. We do not object to using a lower credit quality guardrail to get rid of any excessive conservatism. We recommend considering and comparing with other alternative allocations, something between the current and the proposed, e.g., 20% AA and 80% A. This will help regulators make informed decisions. In any case, we should be consistent with VM-20 and VM-21. If a change is made, it needs to be for all three.

**Commented [VM22307R306]:** Varying opinions among the Subgroup. Voted to revisit and determine the guardrail after the field test.

**Commented [CD308]:** These references should be Section 4.D.3.a.iii and 4.D.3.a.v

**Commented [VM22309R308]:** Edits to address this comment will be reflected in next exposure

- i. Model gross investment income and principal repayments in accordance with the contractual provisions of each asset and in a manner consistent with each scenario.
  - ii. Reflect asset default costs as prescribed in VM-20 Section 9.F and anticipated investment expenses through deductions to the gross investment income.
  - iii. Model the proceeds arising from modeled asset sales and determine the portion representing any realized capital gains and losses.
  - iv. Reflect any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns or other economic values directly in the projection of asset cash flows. Asset defaults are not subject to this requirement, since asset default assumptions must be determined by the prescribed method in VM 20 Sections 7.E, 7.F and 9.F as noted in 4.a.ii above.
- b. Cash flows from general account index funds and general account equity assets— i.e., non-fixed income assets having substantial volatility of returns, such as common stocks and real estate— including starting and reinvestment assets, shall be reflected in the projection as follows:
- i. Determine the grouping for asset categories and the allocation of specific assets to each category in a manner that is consistent with that used for index crediting strategies, as discussed in Section 4.A.2.
  - ii. Project the gross investment return including realized and unrealized capital gains in a manner that is consistent with the stochastically generated scenarios.
  - iii. Model the timing of an asset sale in a manner that is consistent with the investment policy of the company for that type of asset. Reflect expenses through a deduction to the gross investment return using prudent estimate assumptions.
- c. Cash flows for each projection interval for policy loan assets shall follow the requirements in Section 10.H.
- E. Projection of Annuitization Benefits
- 1. Assumed Annuitization Purchase Rates
    - a. For payouts specified at issue (such as single premium immediate annuities, deferred income annuities, and certain structured settlements), such purchase payout rates shall reflect the payout rate specified in the contract.
    - b. For purposes of projecting future elective annuitization benefits (including annuitizations stemming from the election of a GMIB) and withdrawal amounts from GMWBs, the projected annuitization purchase rates shall be determined

**Commented [X310]:** Correct an inaccurate VM section reference. The prescribed asset default spreads assumption should be referred to VM-20 Section 9.F. VM-20 Section 7.E and 7.F are requirements for reinvestment assets, disinvestment and cash flows for invested assets. In 7.F, VM-20 just refers to 9.F for defaults.

**Commented [VM22311R310]:** Edits to address this comment will be reflected in next exposure

**Commented [X312]:** Request clarification around the meaning of "general account index funds".

**Commented [VM22313R312]:** Edits to address this comment will be reflected in next exposure

**Commented [CD314]:** should this reference Section 10.H?

**Commented [VM22315R314]:** Edits to address this comment will be reflected in next exposure

**Commented [CD316]:** is there a difference between "purchase rates" and "payout rates"? Both terms are used, so that makes the language unclear. If they are the same, suggest sticking with "purchase rates".

**Commented [VM22317R316]:** Edits to address this comment will be reflected in next exposure

**Commented [X318]:** Suggest deleting "In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract." as it appears to be covered by E.1.a.

**Commented [VM22319R318]:** Edits to address this comment will be reflected in next exposure

**Commented [X320]:** Reinstate the parenthetical content "(including annuitizations stemming from the election of a GMIB)" since there are GMIB riders attached to fixed annuity products.

**Commented [VM22321R320]:** Edits to address this comment will be reflected in next exposure

assuming that market interest rates available at the time of election are the interest rates used to project general account assets, as determined in Section 4.D.4. ~~In contrast, for payouts specified at issue, the payout rates modeled should be consistent with those specified in the contract.~~

Commented [X322]: Delete sentence since it repeats 4.E.1.a.

Commented [VM22323R322]: Edits to address this comment will be reflected in next exposure

2. Projected Election of GMIBs, GMWBs and Other Annuitization Options

- a. For contracts projected to elect future annuitization options (including annuitizations stemming from the election of a GMIB) or for projections of GMWB benefits once the account value has been depleted, the projections ~~may~~ shall assume the contract will stay in force, the projected periodic payments are paid, and the associated maintenance expenses are incurred.

Commented [X324]: Suggest deleting "may" as there appears to be only option.

Commented [VM22325R324]: Edits to address this comment will be reflected in next exposure

F. Frequency of Projection and Time Horizon

- 1. Use of an annual cash-flow frequency ("timestep") is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of sensitivity to projection frequency should be validated by testing wherein the company should determine that the use of a more frequent—i.e., shorter—time step does not materially increase reserves. A more frequent time increment should always be used when the product features are sensitive to projection period frequency.

Commented [X326]: Projection Period is already covered in 4.A.6. Should not be in two places with different guidance.

Commented [VM22327R326]: Edits to address this comment will be reflected in next exposure

Care must be taken in simulating fee income and expenses when using an annual time step. ~~For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption.~~ It is also important that the frequency of the investment return model be linked appropriately to the projection horizon in the liability model. ~~In particular, the horizon should be sufficiently long so as to capture the vast majority of costs (on a present value basis) from the scenarios.~~

Commented [X328]: Reinstate the deleted example of "For example, recognizing fee income at the end of each period after market movements, but prior to persistency decrements, would normally be an inappropriate assumption."

Commented [VM22329R328]: Edits to address this comment will be reflected in next exposure

**Guidance Note:** As a general guide, the forecast horizon should not be less than 20 years.

G. Compliance with ASOPs

When determining a stochastic reserve SR, the analysis shall conform to the ASOPs as promulgated from time to time by the ASB.

Under these requirements, an actuary will make various determinations, verifications and certifications. The company shall provide the actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in these requirements and responsibilities arising from each applicable ASOP.

Section 5: Reinsurance Ceded and Assumed

A. Treatment of Reinsurance Ceded in the Aggregate Reserve

1. Aggregate Reserve Pre- and Post-Reinsurance Ceded

As noted in Section 3.B, the aggregate reserve is determined both pre-reinsurance ceded and post-reinsurance ceded. Therefore, it is necessary to determine the components needed to determine the aggregate reserve—i.e., the stochastic reserve, additional standard projection amount, the SR, DR, and/or the reserve amount valued using requirements in VM-A and VM-C, as applicable—on both bases. Sections 5.A.2 and 5.A.3 discuss adjustments to inputs necessary to determine these components on both a post-reinsurance ceded and a pre-reinsurance ceded basis. Note that due allowance for reasonable approximations may be used where appropriate.

2. Stochastic Reserve

Reflection of Reinsurance Cash Flows in the DR or SR

- a. In order to determine the aggregate reserve post-reinsurance ceded, accumulated deficiencies, scenario reserves, and the resulting stochastic reserve SR and DR shall be determined reflecting the effects of reinsurance treaties that meet the statutory requirements that would allow the treaty to be accounted for as reinsurance within statutory accounting. This involves including, where appropriate, all projected reinsurance premiums or other costs and all reinsurance recoveries, where the reinsurance cash flows reflect all the provisions in the reinsurance agreement, using prudent estimate assumptions.
  - i. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.
  - ii. All significant terms and provisions within reinsurance treaties shall be reflected. In addition, it shall be assumed that each party is knowledgeable about the treaty provisions and will exercise them to their advantage.

**Guidance Note:** Renegotiation of the treaty upon the expiration of an experience refund provision or at any other time shall not be assumed if such would be beneficial to the company and not beneficial to the counterparty. This is applicable to both the ceding party and assuming party within a reinsurance arrangement.

- iii. If the company has knowledge that a counterparty is financially impaired, the company shall establish a margin for the risk of default by the counterparty. In the absence of knowledge that the counterparty is financially impaired, the company is not required to establish a margin for the risk of default by the counterparty.
- iv. A company shall include the cash flows from a reinsurance agreement or amendment in calculating the stochastic aggregate reserve if such qualifies for credit in compliance with Appendix A-791 of the Accounting Practices and Procedures Manual. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum aggregate reserve by the absolute value of such reductions in surplus.

**Commented [X330]:** The wording and titling may need to be tightened due to clarify which items apply to assumed and ceded reinsurance in the text.

**Commented [VM22331R330]:** Edits to address this comment will be reflected in next exposure

**Commented [X332]:** Delete and just have title be "Reinsurance". Should structure be more like VM-20?

**Commented [X333R332]:** I, II (and III—VM-21 needs edits)

**Commented [VM22334R332]:** Edits to address this comment will be reflected in next exposure

**Commented [CD335]:** "and Assumed" is added here, but there is still only a subsection 5.A that addresses reinsurance ceded (at least in the section header).

**Commented [VM22336R335]:** Edits to address this comment will be reflected in next exposure

**Commented [CD337]:** need to add "and Assumed" here?

**Commented [VM22338R337]:** Edits to address this comment will be reflected in next exposure

**Commented [X339]:** reinstate

**Commented [VM22340R339]:** Edits to address this comment will be reflected in next exposure

**Commented [X341]:** Can take out vague approximation references, since now have a general allowance for appropriate approximations.

**Commented [VM22342R341]:** Edits to address this comment will be reflected in next exposure

**Commented [X343]:** Consistent with VM-20

**Commented [VM22344R343]:** Edits to address this comment will be reflected in next exposure

**Commented [X345]:** VM-20 Section 8.A.1 makes sense here as well.

**Commented [VM22346R345]:** Edits to address this comment will be reflected in next exposure

**Commented [CD347]:** should this be "stochastic reserve"?

**Commented [VM22348R347]:** Edits to address this comment will be reflected in next exposure

**Commented [X349]:** VM-22 draft so far uses aggregate, not minimum.

**Commented [VM22350R349]:** Edits to address this comment will be reflected in next exposure

- b. In order to determine the ~~stochastic reserve~~ SR and DR on a pre-reinsurance ceded basis, accumulated deficiencies, scenario reserves, and the resulting ~~stochastic reserve~~ SR and DR shall be determined ignoring the effects of reinsurance ceded within the projections. Different approaches may be used to determine the starting assets on the ceded portion of the contracts, dependent upon the characteristics of a given treaty:
- i. For a standard coinsurance treaty, where the assets supporting the ceded liabilities were transferred to the assuming reinsurer, one acceptable approach involves a projection based on using starting assets on the ceded portion of the policies that are similar to those supporting the retained portion of the ceded policies or supporting similar types of policies. Scaling up each asset supporting the retained portion of the contract is also an acceptable method.

**Guidance Note:** For standard pro rata insurance treaties ~~(does that do not include experience refunds)~~, where allocated expenses are similar to the renewal expense allowance, reflecting the quota share applied to the present value of future reinsurance cash flows pertaining to the reinsured block of business may be considered as a possible approach to determine the ceded reserves.

- ii. Alternatively, a treaty may contain an identifiable portfolio of assets associated with the ceded liabilities. This could be the case for several forms of reinsurance: funds withheld coinsurance; modified coinsurance; coinsurance with a trust. To the extent these assets would be available to the cedant, an acceptable approach could involve modeling this portfolio of assets. To the extent that these assets were insufficient to defease the ceded liabilities, the modeling would partially default to the approach discussed for a standard coinsurance treaty. To the extent these assets exceeded what might be needed to defease the ceded liabilities (perhaps an over collateralization requirement in a trust), the inclusion of such assets shall be limited.

**Guidance Note:** Section 3.5.2 in ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*, provides possible methods for constructing a hypothetical pre-reinsurance asset portfolio, if necessary, for purposes of the pre-reinsurance reserve calculation.

- c. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
- d. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the NGE in reinsurance cash flows, the company shall include, but not be limited to, the following:
- i. The usual and customary practices associated with such agreements.
  - ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
  - iii. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
  - iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.

Commented [X351]: Correct phrasing.

Commented [VM22352R351]: Edits to address this comment will be reflected in next exposure

- v. Actions that might be taken by a party if the counterparty is in financial difficulty.
- e. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:
  - i. Stochastically model the risk factors directly in the cash-flow model when calculating the SR.
  - ii. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the SR to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is longevity reinsurance.

### 3. Reserve Determined Upon Passing the Exclusion Test

If a company passes the stochastic exclusion test and elects to use a methodology pursuant to applicable Sections VM-A and VM-C, as allowed in Section 3.E, it is important to note that the methodology produces reserves on a pre-reinsurance ceded basis. Therefore, the reserve must be adjusted for any reinsurance ceded accordingly. In addition, reserves valued under applicable Sections in VM-A and VM-C, unadjusted for reinsurance, shall be applied to the contracts falling under the scope of these requirements to determine the aggregate reserve prior to reinsurance.

It should be noted that the ~~pre-reinsurance-ceded~~ and ~~post-reinsurance-ceded~~ reserves may result in different outcomes for the exclusion test. In particular, it is possible that the ~~pre-reinsurance-ceded~~ reserves would pass the relevant exclusion test (and allow the use of VM-A and VM-C) while the ~~post-reinsurance-ceded~~ reserves might not, or vice versa.

### 4. Additional Standard Projection Amount

Where reinsurance is ceded, the additional standard projection amount shall be calculated as described in Section 6 to reflect the reinsurance costs and reinsurance recoveries under the reinsurance treaties. The additional standard projection amount shall also be calculated pre-reinsurance ceded using the methods described in Section 6 but ignoring the effects of the reinsurance ceded.

**Commented [X353]:** VM-20 Section 8.C.7 seems particularly applicable. We encourage others to also review VM-20 Section 8 for other sections that should also apply. VM-20 Section 8 is much more developed than VM-20 Section 5 with many more considerations for assumption setting, and we would suggest the VM-22 subgroup consider rewriting starting with VM-20 instead of VM-21.

**Commented [VM22354R353]:** Subgroup agreed with reflecting this language in the VM-22 draft

**Commented [VM22355]:** Per discussion on how to model mortality for longevity reinsurance, the VM-22 Subgroup decided to port over VM-20 language on stochastic modeling when static prudent estimates do not appropriately capture risk.

**Commented [X356]:** Both referring to reinsurance ceded. Should be clarified.

**Commented [VM22357R356]:** Edits to address this comment will be reflected in next exposure

**Commented [X358]:** ceded

**Commented [VM22359R358]:** Edits to address this comment will be reflected in next exposure

**Commented [X360]:** ceded

**Commented [VM22361R360]:** Edits to address this comment will be reflected in next exposure

**Commented [X362]:** Opposite could also be true.

**Commented [VM22363R362]:** Edits to address this comment will be reflected in next exposure

**Commented [X364]:** The current VM-21 language here looks to work for VM-22 without needing to know the specific assumptions, etc., for the SPA.

**Commented [VM22365R364]:** Edits to address this comment will be reflected in next exposure

Section 6: Standard Projection Amount To Be Determined

**Commented [VM22366]:** NY Comment Letter: Current CARVM standards should be a minimum floor for VM-22 policies, and only the stochastic reserve should permit grouping whereas the minimum floor should be seriatim.

**Commented [X367]:** SPA Section placement here still makes sense, but SPA under development.

**Commented [VM22368R367]:** Edit to update the title of this section will be reflected in next exposure

**Commented [VM22369]:** Refer to equitable comment letter, which expresses support for the standard projection amount as a binding floor, with the suggestion to rely on company-specific assumptions for insignificant assumptions that are difficult to develop.

**Commented [NJ370]:** Once this is written, the language from 4.A.1.a for longevity reinsurance could be added here as well, i.e. the standard projection would use net premiums based on the k factor approach, using the standard projection prescribed assumptions. Floor on std projection is at the contract level



| Section 6: To Be Determined

Section 7: Exclusion Testing

A. Stochastic Exclusion Test Requirement Overview

1. The company may elect to exclude one or more groups of contracts from the stochastic reserve SR calculation if the stochastic exclusion test (SET) is satisfied for each of the group of contracts. The company has the option to calculate or not calculate the SET.
  - a. If the company does not elect to calculate the SET for one or more groups of contracts, or the company calculates the SET and fails the test for such groups of contracts, the reserve methodology described in Section 4 shall be used for calculating the aggregate reserve for those groups of contracts.
  - b. If the company elects to calculate the SET for one or more groups of contracts, and passes the test for such groups of contracts, then for each group of contracts that passes the SET, the company shall choose whether or not to use the reserve methodology described in Section 4 for those groups that group of contracts. If the reserve methodology described in Section 4 is not used for one or more groups of contracts, then the company shall use the reserve methodology pursuant to applicable requirements in VM-A and VM-C to calculate the aggregate reserve for those groups of contracts.
  - c. A company may not exclude a group of contracts from the stochastic reserve SR requirements if there are one or more future hedging programs associated with supporting the contracts, with the exception of hedging programs solely supporting index credits as described in Section 9.A.1.
  - d. A company may elect to automatically exclude one or more groups of policies from the stochastic reserve calculation without passing the stochastic exclusion test (SET) if all of the following are met for all contracts in the group or groups:
    - i. All of the contracts are either:
      - Single Premium Immediate Annuities,
      - Term Certain Payout Annuities, or
      - Structured Settlement Contracts;
    - ii. None of the contracts are pension risk transfer annuities (PRT) or are covered under a longevity reinsurance agreement;
    - iii. Future payout benefits are either level or stay within 5% of the initial payout benefit amount over time;
    - iv. There is either no or an immaterial level of policyholder options permitted within the contracts; and
    - v. The average [Macauley duration] of the liabilities of the contracts as measured from the issue date (or premium determination date) is less than [X].

B. Requirement to Pass the Types of Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

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**Commented [X371]:** Need to modify exclusion testing section to reflect SPA.

**Commented [NJ372]:** Longevity reinsurance likely to be scoped out of the stochastic reserve unless the stochastic reserve includes consideration of stochastic mortality. If it stays as stochastic interest only, then it probably does make sense that it would meet the exclusion testing. For exclusion testing, the k factor approach should continue to apply, and it should not be combined with other blocks of business

**Commented [X373]:** inconsistent groups vs. group references.

**Commented [VM22374R373]:** Edits to address this comment will be reflected in next exposure

**Commented [CD375]:** should this be "stochastic reserve", since Section 4 is about determining the stochastic reserve.

**Commented [VM22376R375]:** Follow Section 4 method of stochastic reserve for Section 3 aggregate reserve if not using the SET

**Commented [X377]:** Decision is independent for each group the SET is performed on.

**Commented [VM22378R377]:** Edits to address this comment will be reflected in next exposure

**Commented [CD379]:** suggest deleting this highlighted part of the sentence

**Commented [VM22380R379]:** Edits to address this comment will be reflected in next exposure

**Commented [CD381]:** see earlier comment about the phrase "future hedge program" being confusing.

**Commented [X382]:** Is "associated with the contracts" the same as the earlier use of "supporting the contracts"? Should the same verbiage be used here? If there is asset hedging for the assets supporting the contracts, it should be included. Need to define "solely supporting" index credits, and also have criteria on the effectiveness/error and documentation of any such hedging that is allowed for excluded business.

**Commented [VM22383]:** subgroup voted to permit PRTs below a certain duration to automatically pass the exclusion test, assuming there is limited optional level/near-level payments, and not PRT or longevity reinsurance. The Academy has agreed to develop a proposed duration threshold.

**Commented [VM22384]:** New language drafted by select Subgroup Members to provide certain condition... [84]

**Commented [CD385]:** Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstratic... [85]

**Commented [VM22386R385]:** Edits to address this comment will be reflected in next exposure

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date~~within 12 months before the valuation date~~ the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. ~~SET~~ Certification Method—For groups of contracts that do not have guaranteed living benefits, future hedging programs, or pension risk transfer business, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material aggregate risk levels across interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments). ~~The company shall provide the certification and documentation supporting the certification to the commissioner upon request.~~

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

- a) A demonstration that, using requirements under VM-A and VM-C for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great as the assets required to support the group of contracts and certificates using the company’s cash-flow testing model under each of the +648 scenarios identified in this section Section 7.C.1 or alternatively each of the New York seven scenarios-economic scenarios- under each of the three mortality adjustment factors identified in Section 7.C.1.
- b) A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
- c) A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company’s non-guaranteed elements (NGEs) policy, assets backing the group of contracts, the company’s longevity risk, and the company’s investment strategy.

C. Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the stochastic reserve SR requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of (b-a)/a is less than the greater of [x]% where and the percentage change that would trigger the company’s materiality standard, where:

Commented [CD387]: not sure why this part is deleted. Suggest adding it back in.

Commented [VM22388R387]: Edits to address this comment will be reflected in next exposure

Commented [X389]: We recommend removing "pension risk transfer business" from products scoped out of SET certification method. It is unclear why this business ... [86]

Commented [VM22390R389]: Subgroup voted to ... [87]

Commented [CD391]: See earlier comments about ... [88]

Commented [X392]: Needs to be defined.

Commented [X393]: Needs a comma

Commented [VM22394R393]: Edits to address t ... [90]

Commented [CD395]: need comma after "business"

Commented [VM22396R395]: Edits to address t ... [89]

Commented [CD397]: what is meant by "aggrega ... [91]

Commented [VM22398R397]: Edits to address t ... [92]

Commented [X399]: This is not in VM-20 and wou ... [93]

Commented [VM22400R399]: Edits to address t ... [94]

Commented [X401]: This is covered by VM-31

Commented [VM22402R401]: Edits to address t ... [95]

Commented [CD403]: note, there is no insertion ... [96]

Commented [VM22404R403]: Edits to address t ... [97]

Commented [CD405]: This wording is a little clun ... [98]

Commented [VM22406R405]: Edits to address t ... [99]

Commented [X407]: Replace all "contracts" with ... [101]

Commented [VM22408R407]: Edits to address ... [100]

Commented [X409]: Need mortality stresses if using NY7

Commented [X410]: Need complete list of risks

Commented [VM22411R410]: Edits to address ... [102]

Commented [CD412]: need to insert "longevity risk" here

Commented [VM22413R412]: Edits to address ... [103]

Commented [X414]: Need complete list of risks

Commented [VM22415R414]: Edits to address ... [104]

Commented [X416]: Need to add a review of th ... [105]

Commented [VM22417R416]: Edits to address ... [106]

Commented [X418]: ~~is written, the SERT assum~~ ... [107]

Commented [VM22419R418]: Consensus to us ... [108]

Commented [X420]: ~~Using (a) in the denomina~~ ... [109]

Commented [VM22421R420]: Consensus to us ... [110]

Commented [X422]: The variability should be as ... [111]

- a. a = the adjusted scenario reserve described in Paragraph 7.C.2.a below using economic scenario 9, and 100% as the adjustment factor for mortality, the baseline economic scenario, as described in Appendix 1.E of VM-20.
- b. b = the largest adjusted scenario reserve described in Paragraph 7.C.2.b-a below under any of the other 15 economic scenarios described in Appendix 1.E of VM-20 under both [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company's margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company's margin for this exercise.

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve for scenarios other than the baseline economic scenario, minus the adjusted scenario reserve for the baseline economic scenario, and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of b.

2. In calculating the ratio in subsection (Section 7.C.1) above:

- a. The company shall calculate an adjusted scenario reserve for the group of contracts for each of each of the 16 scenario economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:
  - i. The scenario reserve defined in Section 4, but with the following differences:
    - a) Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Paragraph Section 7.C.1.b of this section.
    - b) Using the interest rates and equity return assumptions specific to each scenario.
    - c) Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
    - d) Shall reflect future mortality improvement in line with anticipated experience assumptions.
    - e) Shall not reflect correlation between longevity and economic risks.
  - ii. The gross premium reserve developed from the cash flows from the company's asset adequacy analysis models, using the experience assumptions of the company's cash-flow analysis, but with the following differences:
    - a) Using the interest rates and equity return assumptions specific to each scenario.

- Commented [X423]: Correcting reference
- Commented [VM22424R423]: Edits to address this comment will be reflected in next exposure
- Commented [CD425]: better to keep the reference to the full Section (i.e., Section 7.C.2.a.i)
- Commented [VM22426R425]: Edits to address this comment will be reflected in next exposure
- Commented [X427]: Correcting reference
- Commented [VM22428R427]: Edits to address this comment will be reflected in next exposure
- Commented [CD429]: better to keep the reference to the full Section (i.e., Section 7.C.2.b)
- Commented [VM22430R429]: Edits to address this comment will be reflected in next exposure
- Commented [X431]: Need to modify in case largest result is just from the mortality stress on the same scenario.
- Commented [VM22432R431]: Edits to address this comment will be reflected in next exposure
- Commented [X433]: Need to modify in case largest result is just from the economic stress on the same mortality level.
- Commented [VM22434R433]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X435]: Need to ensure we have captured a prudent level of mortality variation for any given company in this test.
- Commented [VM22436R435]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X437]: Updating to reflect mortality/economic scenario combinations.
- Commented [VM22438R437]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X439]: For clarity
- Commented [VM22440R439]: Subgroup agrees with including the 100% mortality scenario.
- Commented [X441]: Be consistent with standard VM references
- Commented [VM22442R441]: Edits to address ... [114]
- Commented [CD443]: better to keep the referenc ... [113]
- Commented [VM22444R443]: Edits to address ... [112]
- Commented [CD445]: why delete this? seems ... [116]
- Commented [VM22446R445]: Edits to address ... [115]
- Commented [X447]: Be consistent with standar ... [117]
- Commented [VM22448R447]: Edits to address ... [118]
- Commented [CD449]: better to reference the f ... [119]
- Commented [VM22450R449]: Edits to address ... [120]

- b) Using the mortality scalars described in ~~Paragraph~~ Section 7.C.1.b of this section.
  - c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the company's cash-flow testing assumptions for default costs and reinvestment earnings.
- b. ~~The company shall use the most current 46 available baseline economic scenario and the 15 other economic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.~~
- c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.
- d. ~~The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.~~
- e. ~~If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to not conduct the stochastic exclusion ratio test under only a pre-reinsurance-ceded basis upon determining the , either pre-reinsurance-ceded basis upon determining the prior post-reinsurance-reserve-ceded-aggregate reserve.~~
3. ~~If the ratio calculated in this section is less than [x]% pre-non-proportional reinsurance, but is greater than [x]% post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.~~
- a. An example of an acceptable demonstration:
    - i. For convenience in notation • SERT = the ratio (b-a)/a defined in Section 7.C.1 above
      - a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted SERT<sub>gn</sub>
      - b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted SERT<sub>nn</sub>
    - ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.

**Commented [X451]:** Be consistent with standard VM references

**Commented [VM22452R451]:** Edits to address this comment will be reflected in next exposure

**Commented [CD453]:** better to reference the full Section

**Commented [VM22454R453]:** Edits to address this comment will be reflected in next exposure

**Commented [X455]:** No reason for change/inconsistency with other chapters - reject edit.

**Commented [VM22456R455]:** Edits to address this comment will be reflected in next exposure

**Commented [X457]:** Clarification is needed around reference to “significantly different risk profiles”.

**Commented [VM22458R457]:** Subgroup voted to use the “significantly different risk profiles” language for the exclusion test, consistent with VM-20.

**Commented [CD459]:** to be more specific, say “stochastic exclusion ratio test”

**Commented [VM22460R459]:** Edits to address this comment will be reflected in next exposure

**Commented [X461]:** Original did not make sense. Also, the point is that you just need one basis, either pre-reinsurance or post-reinsurance.

**Commented [VM22462R461]:** Edits to address this comment will be reflected in next exposure

**Commented [X463]:** We request clarification or definition of the term “non-proportional reinsurance”.

**Commented [X464]:** Does this make sense for VM-20 as well?

**Commented [VM22465R464]:** Subgroup to only focus on VM-22 for now

iii. So, if  $SERT_{gn} \leq [x]_{T-1}\%$  but  $SERT_{nn} > [x]_{T-1}\%$ , then compute the largest percent increase in reserve (LPIR) =  $(b-a)/a$ , both “gross of non-proportional” and “net of non-proportional.”

$$LPIR_{gn} = (b_{gy} - a_{gy}) / (b_{gn} - a_{gn}) / a_{gn}$$

$$LPIR_{nn} = (b_{ny} - a_{ny}) / (b_{nn} - a_{nn}) / a_{nn}$$

Note that the scenario underlying  $b_{gn}$  could be different from the scenario underlying  $b_{nn}$ .

If  $SERT_{gn} \times LPIR_{nn} / LPIR_{gn} < [x]_{T-1}\%$ , then the block of contracts passes the SERT.

b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 1648 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.

4. The SERT may not be used for a group of contracts if, using the current year’s data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method in this section of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in this section and concluded that such certification could not legitimately be made.

D. Stochastic Exclusion Demonstration Test

1. In order to exclude a group of contracts from the stochastic reserve SR requirements using the methodology in this section Stochastic Exclusion Demonstration Test, the company must provide a demonstration in the PBR Actuarial Report in the first year and at least once every three calendar years thereafter that complies with the following:

a. The demonstration shall provide a reasonable assurance that if the stochastic reserve SR was calculated on a stand-alone basis for the group of contracts subject to the stochastic reserve SR exclusion, the resulting stochastic reserve for those groups of contracts would not be higher than the statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C. The demonstration shall take into account whether changing conditions over the current and two subsequent calendar years would be likely to change the conclusion to exclude the group of contracts from the stochastic reserve SR requirements.

b. If, as of the end of any calendar year, the company determines the aggregate statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C for the group of contracts no longer adequately provides for all material risks, the exclusion shall be discontinued, and the company fails the SERT SET for those contracts.

c. The demonstration may be based on analysis from a date that precedes the valuation date for the initial year to which it applies if the demonstration includes an

Commented [X466]: We believe subscript “gy” should be “gn”

Commented [VM22467R466]: Edits to address this comment will be reflected in next exposure

Commented [X468]: % missing

Commented [VM22469R468]: Edits to address this comment will be reflected in next exposure

Commented [X470]: Note that LPIR is just the SERT using the VM-22 formulation (b-a)/a.

Commented [VM22471R470]: Edits to address this comment will be reflected in next exposure

Commented [X472]: The first and last terms on the left side of this equation cancel out, so it just ends up with needing to pass the SERT on the net basis again. This worked when (c) was the denominator, but now with (a) in the denominator this adjustment is meaningless. Take out the whole example, or revise the SERT to use benefits in the denominator again. Or some new formulation for SERT.

Commented [VM22473R472]: Updated denominator, addressing this issue

Commented [X474]: In VM-20, it is only prohibited for the clearly sufficiently robust attempts of the demonstration method where failing shows the SR would be greater. The other two options could have been incomplete demonstrations and not necessarily imply the SR would be dominant.

Commented [X475]: Clearer language

Commented [VM22476R475]: Edits to address this comment will be reflected in next exposure

Commented [X477]: Does this statement imply a floor reserve of VM-A and VM-C? VM-20 does require the NPR as the floor of the reserve but as written, VM-22 does not require a floor reserve. Recommend removing 1.a. Same statement with the 2.a statement demonstration. This requirement does not apply to the other permitted tests, which seemed counterintuitive.

Commented [CD478]: should this, instead, refer to the “statutory reserve determined pursuant to the applicable requirements in VM-A and VM-C?”

Commented [VM22479R478]: Edits to address this comment will be reflected in next exposure

Commented [X480]: Typo is also in VM-20

Commented [VM22481R480]: Will follow-up upon addressing VM-30 disclosure requirements

explanation of why the use of such a date will not produce a material change in the outcome, as compared to results based on an analysis as of the valuation date.

- d. The demonstration shall provide an effective evaluation of the residual risk exposure remaining after risk mitigation techniques, such as derivative programs and reinsurance.

2. The company may use one of the following or another method acceptable to the insurance commissioner to demonstrate compliance with ~~subsection~~Section 7.D.1 above:

- a. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis.
- b. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the scenario reserve that results from each of a sufficient number of adverse deterministic scenarios.
- c. Demonstrate that the statutory reserve calculated in accordance with VM-A and VM-C is greater than the ~~stochastic reserve~~SR calculated on a stand-alone basis, but using a representative sample of contracts in the ~~stochastic reserve~~SR calculations.
- d. Demonstrate that any risk characteristics that would otherwise cause the ~~stochastic reserve~~SR calculated on a stand-alone basis to exceed the statutory reserve calculated in accordance with VM-A and VM-C, are not present or have been substantially eliminated through actions such as hedging, investment strategy, reinsurance or passing the risk on to the ~~contract~~policyholder by contract provision.

E. Deterministic Certification Option

1. The company ~~has the option to may~~ determine the ~~stochastic reserve~~SR for a group of contracts using a single deterministic economic scenario, subject to the following conditions.

- a. The company certifies that economic conditions do not materially influence anticipated contract holder behavior for the group of ~~policies, contracts and certificates~~. Examples of contract holder options that are materially influenced by economic conditions include surrender benefits, recurring premium payments, and guaranteed living benefits.
- b. The company certifies that the group of ~~policies, contracts and certificates~~ is not supported by a reinvestment strategy that contains ~~future hedge purchases~~.
- c. ~~The company must perform and disclose results from the stochastic exclusion ratio test following the requirements in Section 7.C, thereby disclosing and the scenario reserve volatility across various company must pass the SERT when considering only the 16 economic scenarios, paired with the 100% mortality scenario.~~

Commented [CD482]: should say "Section"

Commented [VM22483R482]: Edits to address this comment will be reflected in next exposure

Commented [CD484]: "contract holder"

Commented [VM22485R484]: Edits to address this comment will be reflected in next exposure

Commented [X486]: Need SPA for DR as well as SR

Commented [CD487]: suggest saying "may" instead of "has the option to"

Commented [VM22488R487]: Edits to address this comment will be reflected in next exposure

Commented [CD489]: "contracts"

Commented [VM22490R489]: Edits to address this comment will be reflected in next exposure

Commented [X491]: Clarify if this was the intent to exclude contracts supported by index hedging.

Commented [X492]: This is needed to assure the SR is not needed. Otherwise, this section is incomplete and does not support using a DR.

Commented [VM22493R492]: Subgroup agrees with including the 100% mortality scenario.

- d. The company must disclose a description of contracts and associated features in the certification.

~~Drafting Note: Consider revisiting Paragraph E.1.c to possibly either require i) falling below a preset threshold for the exclusion ratio test under a single longevity/mortality scenario; or ii) to pass the exclusion test if longevity is not included as part of the ratio test.~~

2. The ~~stochastic reserve~~SR for the group of contracts under the Deterministic Certification Option is determined as follows:

- a. Cash flows are projected in compliance with the applicable requirements in Section 4, Section 5, Section 10, and Section 11 of VM-22 over a single economic scenario (scenario 12 found in Appendix 1 of VM-20).
- b. The ~~stochastic reserve~~SR equals the scenario reserve following the requirements for Section 4.

~~Guidance Note: The Deterministic Certification Option is intended to provide a non stochastic option for Single Premium Immediate Annuities (SPIAs) and similar payout annuity products that contain limited or no optionality in the asset and liability cash flow projections.~~

Commented [X494]: ~~agree with drafting note. Edit above~~

Commented [VM22495R494]: Subgroup agrees with including the 100% mortality scenario.

Commented [X496]: It may not be appropriate to use scenario 12 to calculate the scenario reserve for SPIA. See this article <https://www.soa.org/sections/financial-reporting/financial-reporting-newsletter/2021/july/fr-2021-07-su/>

"in an increasing interest rate environment for business where policyholder behavior is sensitive to prevailing interest rates, life insurers may face an increase in disintermediation risk (i.e., the risk of having to sell assets, potentially at a loss, to fund policyholder surrender benefits) For example, rising interest rates, particularly sudden jumps (e.g., New York 7 pop-up scenario with an immediate interest rate increase of 3 percent), may lead to higher actual and projected policyholder surrenders as policyholders seek out higher yielding investment opportunities. These increasing cash demands may require fixed income assets to be sold at depressed prices, and resultant projected losses (or lower gains) may result in reserve insufficiencies, necessitating the need for AAT reserves."

Commented [X497]: Recommend deleting guidance note, as it doesn't provide full or clear scope of what may be excluded, so could be misread to either guarantee option for certain products or exclude the option for other products.



Section 8: To Be Determined (Scenario Generation for VM-21)

Section 9: Modeling Hedges under a **Future Non-Index Credit Hedging Strategy**

A. Initial Considerations

1. This section applies to modeling of hedges other than situations where the company (a) only hedges index credits. ~~If the company, or (b) clearly separates index credit hedging from other hedging, then only the section only pertains to the other hedging if the index hedging follows. In those situations, the modeling of hedges supporting index credits can be simplified including applying an index credit hedge margin, following the requirements in Section 4.A.4.b.i.~~
2. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the contracts falling under the scope of these requirements shall be included in the calculation of the ~~stochastic reserve~~SR, determined in accordance with Section 3.D and Section 4.D.
3. The company shall take into account the costs and benefits of hedge positions expected to be held by the company in the future along each scenario. Company management is responsible for developing, documenting, executing and evaluating the investment strategy for future hedge purchases. ~~Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months, including the hedging strategy, used to implement the investment policy.~~
4. For this purpose, the investment assets refer to all the assets, including derivatives supporting covered products and guarantees. This also is referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in time in all scenarios. The hedging portfolio, which also is referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. There is no attempt to distinguish what is the hedging portfolio and what is the investment portfolio in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.
5. This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the stochastic cash-flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

B. Modeling Approaches

1. The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two types of methods as described below. Although a hedging strategy normally would be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the ~~stochastic reserve~~SR otherwise calculated.
2. The fundamental characteristic of the first type of method, referred to as the “explicit method,” is that hedging positions and their resulting cash flows are included in the stochastic cash-flow model used to determine the scenario reserve, as discussed in Section 3.D, for each scenario.

**Commented [X498]:** Section 4.A.4 (Modeling of Hedges) has some relationship with this section, we request clarification around the applicability of these two areas of hedge guidance.

**Commented [VM22499R498]:** Edits to address this comment will be reflected in next exposure

**Commented [CD500]:** see previous comments about use of the word "future" to describe "hedging strategy"

**Commented [X501]:** We seek clarification of this text: if a company only hedges indices or separates index crediting from other hedges, does this apply, or does it only apply to any other hedging?

**Commented [VM22502R501]:** Edits to address this comment will be reflected in next exposure

**Commented [X503]:** The sentence “Prior to reflection in projections, the strategy for future hedge purposes shall be the actual practice of the company for a period of time not less than [6] months.” seems to suggest you would do something other than the actual hedging strategy after [6] months. In this case, what are you assuming for modeling? We suggest clarification of this sentence.

**Commented [VM22504R503]:** Edits to address this comment will be reflected in next exposure

**Commented [CD505]:** is this a typo? should this be "purchases"?

**Commented [VM22506R505]:** Edits to address this comment will be reflected in next exposure

**Commented [X507]:** This 6 month exclusion creates unintended optionality for inclusion/exclusion based on whether a hedge strategy is considered "new". Instead, this should be addressed through the Error factor for new programs being temporarily larger.

**Commented [VM22508R507]:** Edits to address this comment will be reflected in next exposure

**Commented [X509]:** Reinstate the original sentence which puts the reflection of hedging into the greater context of reflecting the company's investment policy.

**Commented [VM22510R509]:** Edits to address this comment will be reflected in next exposure

**Commented [X511]:** Agree that the uncertainty associated with new strategies should be handled via the E factor, not through blanket exclusion.

**Commented [VM22512R511]:** Edits to address this comment will be reflected in next exposure

3. The fundamental characteristic of the second type of method, referred to as the “implicit method,” is that the effectiveness of the current hedging strategy on future cash flows is evaluated, in part or in whole, outside of the stochastic cash-flow model. There are multiple ways that this type of modeling can be implemented. In this case, the reduction to the ~~stochastic reserve~~SR otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.
4. Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions) on the ~~stochastic reserve~~SR needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. In addition, the reduction to the ~~stochastic reserve~~SR attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company’s ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect ~~or mock tested~~.

**Guidance Note:** No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some but not all risks, transform some risks into others, introduce new risks, or have other imperfections. For example, a delta-only hedging strategy does not adequately hedge the risks measured by the “Greeks” other than delta.

5. A safe harbor approach is permitted for those companies whose modeled hedge assets comprise only linear instruments not sensitive to implied volatility. For companies with option-based hedge strategies, electing this approach would require representing the option-based portion of the strategy as a delta-rho two-Greek hedge program. The normally modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greeks as the original option portfolio.

C. Calculation of ~~Stochastic Reserve~~SR (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the modeling of hedges (including both currently held and future hedge positions) into the stochastic cash-flow model on a best efforts basis, including all of the factors and assumptions needed to model the hedges (e.g., stochastic implied volatility). The determination of CTE70 (best efforts) may utilize either explicit or implicit modeling techniques.
2. The company shall calculate a CTE70 (adjusted) by recalculating the CTE70 assuming the company has no ~~future hedging purchases strategy~~, except those to hedge interest credits and hedge assets held by the company on the valuation date, therefore following the requirements of Section 4.A.4.a and 4.A.4.b.i.
3. Because most models will include at least some approximations or idealistic assumptions, CTE70 (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the value for the ~~stochastic reserve~~SR is given by:

$$\text{Stochastic reserveSR} = \text{CTE70 (best efforts)} + E \times \max[0, \text{CTE70 (adjusted)} - \text{CTE70 (best efforts)}]$$

**Commented [X513]:** Is delta-only hedging common in VM-22 hedging? Could the example be replaced with something more relevant to VM-22 hedging?

**Commented [X514]:** The Hedging DG is currently working on language and we will want to be consistent across VM-20, VM-21, and VM-22.

**Commented [CD515]:** perhaps better to say “no future hedge purchases...”

**Commented [VM22516R515]:** Edits to address this comment will be reflected in next exposure

4. The company shall specify a value for  $E$  (the “error factor”) in the range from 5% to 100% to reflect the company’s view of the potential error resulting from the level of sophistication of the stochastic cash-flow model and its ability to properly reflect the parameters of the hedging strategy (i.e., the Greeks being covered by the strategy), as well as the associated costs, risks and benefits. The greater the ability of the stochastic model to capture all risks and uncertainties, the lower the value of  $E$ . The value of  $E$  may be as low as 5% only if the model used to determine the CTE70 (best efforts) effectively reflects all of the parameters used in the hedging strategy. If certain economic risks are not hedged, yet the model does not generate scenarios that sufficiently capture those risks,  $E$  must be in the higher end of the range, reflecting the greater likelihood of error. Likewise, simplistic hedge cash-flow models shall assume a higher likelihood of error.
5. The company shall conduct a formal back-test, based on an analysis of ~~at least the most recent~~ available relevant period of data (but no less than 12 months), to assess how well the model is able to replicate the hedging strategy in a way that supports the determination of the value used for  $E$ .
6. Such a back-test shall involve one of the following analyses:
  - a. For companies that model hedge cash flows directly (“explicit method”), replace the stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario that represents the market path that actually manifested over the selected back-testing period and compare the projected hedge asset gains and losses against the actual hedge asset gains and losses – both realized and unrealized – observed over the same time period. For this calculation, the model assumptions may be replaced with parameters that reflect actual experience during the back-testing period. In order to isolate the comparison between the modeled hedge results and actual hedge results for this calculation, the projected liabilities should accurately reflect the actual liabilities throughout the back-testing period; therefore, adjustments that facilitate this accuracy (e.g. reflecting actual experience instead of model assumptions, including new business, etc.) are permissible.

To support the choice of a low value of  $E$ , the company should ascertain that the projected hedge asset gains and losses are within close range of 100% (e.g., 80–125%) of the actual hedge asset gains and losses. The company may also support the choice of a low value of  $E$  by achieving a high R-squared (e.g., 0.80 or higher) when using a regression analysis technique.
  - b. For companies that model hedge cash flows implicitly by quantifying the cost and benefit of hedging using the fair value of the hedged item (an “implicit method” or “cost of reinsurance method”), calculate the delta, rho and vega coverage ratios in each month over the selected back-testing period in the following manner:
    - i. Determine the hedge asset gains and losses—both realized and unrealized—incurred over the month attributable to equity, interest rate, and implied volatility movements.
    - ii. Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements. The hedged item should be defined in a manner that reflects the proportion of risks hedged (e.g., if a company elects to hedge 50% of a contract’s market risks, it should quantify the fair value of the hedged item as 50% of the fair value of the contract).

Commented [X517]: We have been getting weak E factor support, with minimum backtesting due to the current phrasing.

Commented [X518R517]: Recommend adding stress testing language similar to Section 4.A.4.b.i.c) but with edits based on TDI’s comments/suggestions to Section 4.A.4.b.i.c).

Commented [VM22519R517]: Edits to address this comment will be reflected in next exposure

Commented [X520]: Recommend adding reporting requirement to VM-31 to disclose if company has switched between explicit method and implicit method, discuss rationale of the change and the change impact.

Commented [VM22521R520]: Edits to address this comment will be reflected in next exposure

- iii. Calculate the delta coverage ratio as the ratio between (i) and (ii) attributable to equity movements.
  - iv. Calculate the rho coverage ratio as the ratio between (i) and (ii) attributable to interest rate movements.
  - v. Calculate the vega coverage ratio as the ratio between (i) and (ii) attributable to implied volatility movements.
  - vi. To support the company's choice of a low value of E, the company should be able to demonstrate that the delta and rho coverage ratios are both within close range of 100 % (e.g., 80–125%) consistently across the back-testing period.
  - vii. In addition, the company should be able to demonstrate that the vega coverage ratio is within close range of 100 % in order to use the prevailing implied volatility levels as of the valuation date in quantifying the fair value of the hedged item for the purpose of calculating CTE70 (best efforts). Otherwise, the company shall quantify the fair value of the hedged item for the purpose of calculating CTE70 (best efforts) in a manner consistent with the realized volatility of the scenarios captured in the CTE (best efforts).
- c. Companies that do not model hedge cash flows explicitly, but that also do not use the implicit method as outlined in Section 9.C.6.b above, shall conduct the formal back-test in a manner that allows the company to clearly illustrate the appropriateness of the selected method for reflecting the cost and benefit of hedging, as well as the value used for E.
7. A company that does not have 12 months of experience to date shall set E to a value that reflects the amount of experience available, and the degree and nature of any change to the hedge program. For a material change in strategy, with ~~no less than 6 months of history~~, E should be ~~at least 1.0-50~~. However, E may be lower than ~~1.0-50~~ if ~~some~~ at least 6 months of reliable experience is available and/or if the change in strategy is a minor refinement rather than a substantial material change in strategy.

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily large (e.g.,  $\geq 50\%$ ) for substantial changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy) where the company has not been able to provide a meaningful simulation of hedge performance based on the new strategy.
- A temporary moderate increase (e.g., 15–30%) in error factor should be used for substantial modifications to hedge programs or modeling where meaningful simulation has not been created (e.g., adding second-order hedging, such as gamma or rate convexity).
- No increase in the error factor may be used for incremental modifications to the hedge strategy (e.g., adding death benefits to a program that previously covered only living benefits, or moving from swaps to Treasury Department futures).

**Commented [X522]:** 6 month restriction should be handled in the error factor. Other language for clarity. Edited guidance note below to be consistent with this.

**Commented [VM22523R522]:** Edits to create consistency with recently adopted APF 2020-12 will be considered for the next exposure

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily large (e.g.,  $\geq 50\%$ ) for substantial changes in hedge methodology (e.g., moving from a fair value based strategy to a stop-loss strategy) where the company has not been able to provide a meaningful simulation of hedge performance based on the new strategy.
- A temporary moderate increase (e.g., 15–30%) in error factor should be used for substantial modifications to hedge programs or modeling where meaningful simulation has not been created (e.g., adding second-order hedging, such as gamma or rate convexity).
- No increase in the error factor may be used for incremental modifications to the hedge strategy (e.g., adding death benefits to a program that previously covered only living benefits, or moving from swaps to Treasury Department futures).

**Guidance Note:** The following examples are provided as guidance for determining the E factor when there has been a change to the hedge program:

- The error factor should be temporarily 100% for material changes in hedge methodology (e.g., moving from a fair-value based strategy to a stop-loss strategy).
- An increase in the error factor may not always be needed for minor refinements to the hedge strategy (e.g., moving from swaps to Treasury futures).

8. The company shall set the value of E reflecting the extent to which the future hedging program is clearly defined. To support a value of E below 1.0, there should be very robust documentation outlining the future hedging program. To the extent that documentation outlining the future hedging program is incomplete, the value of E shall be increased. Any increases required to the value of E to reflect that documentation is not available to support that the future hedging program is clearly defined shall be in addition to increases to the value of E to reflect a lack of historical experience or to reflect the back-testing results.

E. Additional Considerations for CTE70 (best efforts)

If the company is following a CDHS, the fair value of the portfolio of contracts falling within the scope of these requirements shall be computed and compared to the CTE70 (best efforts) and CTE70 (adjusted). If the CTE70 (best efforts) is below both the fair value and CTE70 (adjusted), the company should be prepared to explain why that result is reasonable.

For the purposes of this analysis, the SR and fair value calculations shall be done without requiring the scenario reserve for any given scenario to be equal to or in excess of the cash surrender value in aggregate for the group of contracts modeled in the projection.

D. Specific Considerations and Requirements

1. As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the stochastic reserve SR, the company should review actual historical hedging effectiveness. The company shall evaluate the appropriateness of the assumptions

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**Commented [X524]:** Work is being done by the hedging DG. This is a placeholder. Need to reflect how clearly defined and well documented the hedge program is, to be able to rely on the backtesting provided. To the extent that hedge programs are not clearly defined, E should be increased to reflect that the backtesting cannot be relied on as an indicator of future effectiveness.

**Commented [X525]:** Reinstate this disclosure item, which is a rough reasonableness check for regulators to review information on the modeled hedge benefit and to prompt further discussion.

**Commented [VM22526R525]:** Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point.

**Commented [CD527]:** Not sure why this section is being deleted. Perhaps references to CDHS could be deleted, but otherwise this section still seems applicable.

**Commented [VM22528R527]:** Subgroup voted in favor of retaining the fair value disclosure wording here, which is only subject to non-index credit hedges at this point.

on future trading, transaction costs, other elements of the model, the strategy, the mix of business and other items that are likely to result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, are likely to result in adverse results relative to those modeled. The parameters and assumptions shall be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model shall be modified to reflect them at either anticipated experience or adverse estimates of the parameters.

2. A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets are subject to material discontinuities. This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the fixed indexed annuity and other in-scope products account balances reach a predetermined level in relationship to the guarantees. Any hedging strategy, including a delta hedging strategy, can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed contract holder options embedded in the variable fixed indexed annuities and other in-scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the stochastic reserve SR, the company must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.
3. A strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.
4. The combination of elements of the stochastic cash-flow model—including the initial actual market asset prices, prices for trading at future dates, transaction costs and other assumptions—should be analyzed by the company as to whether the stochastic cash-flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:
  - a. Hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money.
  - b. Hedging strategies that, with a given amount of initial money, never make less than accumulation at the one-period risk-free rates in any scenario but make more than this in one or more scenarios.
5. If the stochastic cash-flow model allows for such situations, the company should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the stochastic reserve SR otherwise calculated.

Commented [X529]: Suggest replacing "indexed" with "fixed" since this would apply to all fixed annuities.

Commented [VM22530R529]: Edits to address this comment will be reflected in next exposure

Commented [X531]: Editorial change of "variable fixed indexed annuity" to be "fixed indexed annuity and other in-scope products"

Commented [VM22532R531]: Edits to address this comment will be reflected in next exposure

Commented [X533]: Recommend deleting "including a delta hedging strategy" as it is already covered by "any hedging strategy" and it is not clear if delta hedging strategy is the most common strategy in VM-22 hedging to be used as a general example.

Commented [VM22534R533]: Edits to address this comment will be reflected in next exposure

6. In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.



Section 10: Guidance and Requirements for Setting Contract Holder Behavior Prudent Estimate Assumptions

A. General

Contract holder behavior assumptions encompass actions such as lapses, withdrawals, transfers, recurring deposits, benefit utilization, option election, etc. Contract holder behavior is difficult to predict accurately, and variance in behavior assumptions can significantly affect the ~~results~~ reserves level. In the absence of relevant and fully credible empirical data, the company should set behavior assumptions as guided by Principle 3 in Section 1.B and Section 12.

In setting behavior assumptions, the company should examine, but not be limited by, the following considerations:

1. Behavior can vary by product, market, distribution channel, index performance, interest credited (current and guaranteed rates), time/product duration, etc.
2. Options embedded in the product may affect behavior.
3. Utilization of options may be elective or non-elective in nature. Living benefits often are elective, and death benefit options are generally non-elective.
4. Elective contract holder options may be more driven by economic conditions than non-elective options.
5. As the value of a product option increases, there is an increased likelihood that contract holders will behave in a manner that maximizes their financial interest (e.g., lower lapses, higher benefit utilization, etc.).
6. Behavior formulas may have both rational and irrational components (irrational behavior is defined as situations where some contract holders may not always act in their best financial interest). The rational component should be dynamic, but the concept of rationality need not be interpreted in strict financial terms and might change over time in response to observed trends in contract holder behavior based on increased or decreased financial efficiency in exercising their contractual options.
7. Options that are ancillary to the primary product features may or may not be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many things, such as:
  - a. For what purpose was the product purchased?
  - b. Is the option elective or non-elective?
  - c. Is the value of the option well-known?
8. External influences may affect behavior.

B. Aggregate vs. Individual Margins

1. Prudent estimate assumptions are developed by applying a margin for uncertainty to the anticipated experience assumption. The issue of whether the level of the margin applied to the anticipated experience assumption is determined in aggregate or independently for each and every behavior assumption is discussed in Principle 3 in Section 1.B.

Commented [X535]: Editorial clarification

Commented [VM22536R535]: Edits to address this comment will be reflected in next exposure

Commented [X537]: Need general assumption setting section, see APF 2021-11.

Commented [VM22538R537]: Edits to address this comment will be reflected in next exposure

Commented [X539]: We would suggest rewording this section to be considerations rather than posed as questions.

Commented [X540]: Editorial clarification

Commented [VM22541R540]: Edits to address this comment will be reflected in next exposure

Commented [X542]: Recommend adding some examples here if this is included.

Commented [VM22543R542]: Edits to address this comment will be reflected in next exposure

2. Although this principle discusses the concept of determining the level of margins in aggregate, it notes that the application of this concept shall be guided by evolving practice and expanding knowledge. From a practical standpoint, it may not always be possible to completely apply this concept to determine the level of margins in aggregate for all behavior assumptions.
3. Therefore, the company shall determine prudent estimate assumptions independently for each behavior (e.g., mortality, lapses and benefit utilization), using the requirements and guidance in this section and throughout these requirements, unless the company can demonstrate that an appropriate method was used to determine the level of margin in aggregate for two or more material behavior assumptions, if relevant to the risks in the product, and thus the approach will not understate the reserve.

C. Sensitivity Testing

The impact of behavior can vary by product, time period, etc. For any assumption that is not prescribed or stochastically modeled, the company/qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing to ensure that the assumption is set at the conservative end of the plausible range. The company shall sensitivity test:

- Surrenders.
- Partial withdrawals.
- Benefit utilization.
- Account transfers.
- Future deposits.
- Other behavior assumptions if relevant to the risks in the product.

Sensitivity testing of assumptions is required and shall be more complex than, for example, base lapse assumption plus or minus X% across all contracts. A more appropriate sensitivity test in this example might be to devise parameters in a dynamic lapse formula to reflect more out-of-the-money contracts lapsing and/or more holders of in-the-money contracts persisting and eventually using the guarantee. The company should apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the company shall use higher margins when the underlying experience is less than fully relevant and credible.

The company shall examine the results of sensitivity testing to understand the materiality of prudent estimate assumptions on the modeled reserve. The company shall update the sensitivity tests periodically as appropriate, considering the materiality of the results of the tests. The company may update the tests less frequently (but no less than every 3 years) when the tests show less sensitivity of the modeled reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company may perform sensitivity testing:

1. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.

Commented [X544]: Clarification

Commented [VM22545R544]: Edits to address this comment will be reflected in next exposure

Commented [X546]: Suggest updating bullet to "Other material behavior assumptions if relevant to the risks in the product."

Commented [VM22547R546]: Edits to address this comment will be reflected in next exposure

Commented [X548]: Sensitivity testing is covered by the submitted APF 2021-11 for VM-21, and we should be consistent. VM-21 is currently lacking on sensitivity testing

Commented [VM22549R548]: Make edits to be consistent with VM-21 APFs prior to adoption of VM-22

Commented [VM22550R548]: Edits to address this comment will be reflected in next exposure

Commented [CD551]: why assign this specifically to the QA rather than leaving it as the responsibility of "the company", like we do elsewhere in the requirements?

Commented [VM22552R551]: Edits to address this comment will be reflected in next exposure

Commented [X553]: include for completion

Commented [VM22554R553]: Edits to address this comment will be reflected in next exposure

Commented [X555]: Consistent with APF 2021-11.

Commented [VM22556R555]: Edits to address this comment will be reflected in next exposure

2. Using data from prior periods.

D. Specific Considerations and Requirements

1. Within materiality considerations, the company should consider all relevant forms of contract holder behavior and persistency, including, but not limited to, the following:
  - a. Mortality (additional guidance and requirements regarding mortality is contained in Section 11).
  - b. Surrenders.
  - c. Partial withdrawals (systematic and elective).
  - d. Account transfers (switching/exchanges).
  - e. Resets/ratchets of the guaranteed amounts (automatic and elective).
  - f. Future deposits.
  - g. Income start date for the benefit utilization.
  - h. Commutation of benefit (from periodic payment to lump sum) or vice versa.

2. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the calculated provisions.

For example:

- a. The impact of account transfers (intra-contract index “switching”) might be ignored, unless required under the terms of the contract (e.g., automatic ~~asset~~ re-allocation/rebalancing, ) or if the contract provisions incentivize the contract holders to transfer between accounts.
- b. Future deposits might be excluded from the model, unless required by the terms of the contracts under consideration and then only in such cases where future premiums can reasonably be anticipated (e.g., with respect to timing and amount).
- c. For some non-elective benefits (nursing home benefits for example), a zero incidence rate after the surrender charge has ended, or the cash value has depleted, may be acceptable since use of a non-zero rate could reduce the modeled reserve.

~~Guidance Note: For some non elective benefits (nursing home benefits for example), unless relevant company experience exists to the contrary, the use of incidence rates greater than zero after the surrender charge has ended, or the cash value was depleted might be inappropriate may not be prudent since it would reduce the modeled reserve.~~

3. However, the company should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to test the impact of a shifting asset mix and/or consider future deposits to the extent they can reasonably be anticipated and increase the calculated amounts.

Commented [X557]: Clarification

Commented [VM22558R557]: Edits to address this comment will be reflected in next exposure

Commented [X559]: clarification

Commented [VM22560R559]: Edits to address this comment will be reflected in next exposure

Commented [CD561]: delete this word

Commented [VM22562R561]: Edits to address this comment will be reflected in next exposure

Commented [X563]: Reviewing, this guidance note does not exist in the 2019, 2020, 2021, or 2022 versions of VM-21. Where is this from? Should this be added to VM-21?

4. Normally, the underlying model assumptions would differ according to the attributes of the contract being valued. This would typically mean that contract holder behavior and persistency may be expected to vary according to such characteristics as (this is not an exhaustive list):
  - a. Gender.
  - b. Attained age.
  - c. Issue age.
  - d. Contract duration.
  - e. Time to maturity.
  - f. Tax status.
  - g. Account value.
  - h. Interest credited (current and guaranteed).
  - i. Available indices.
  - j. Guaranteed benefit amounts.
  - k. Surrender charges, transaction fees or other contract charges.
  - l. Distribution channel.
5. Unless there is clear evidence to the contrary, behavior assumptions should be no less conservative than past experience. Margins for contract holder behavior assumptions shall assume, without relevant and credible experience or clear evidence to the contrary, that contract holders' efficiency will increase over time.
6. In determining contract holder behavior assumptions, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience), whether or not the segment is directly written by the company. If data from a similar business segment are used, the assumption shall be adjusted to reflect differences between the two segments. Margins shall reflect the data uncertainty associated with using data from a similar but not identical business segment.
7. Where relevant and fully credible empirical data do not exist for a given contract holder behavior assumption, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is shifted towards the conservative end of the plausible range of expected experience that serves to increase the stochastic reserve. SR. If there are no relevant data, the company shall set the contract holder behavior assumption to reflect the increased uncertainty such that the contract holder behavior assumption is at the conservative end of the range. Such adjustments shall be consistent with the definition of prudent estimate, with the principles described in Section 1.B, and with the guidance and requirements in this section.
8. Ideally, contract holder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. It is important to note, however, that contract holder behavior should neither assume that all contract holders act with 100%

**Commented [X564]:** This also applies to VM-21, as there are fixed accounts. Is there any reason not to be consistent?

**Commented [VM22565R564]:** Only to focus on VM-22 for now

**Commented [X566]:** This is not a synonym (perhaps transfer fees is a subset of transaction fees) - why would transaction fees apply for VM-21, but only transfer fees for VM-22?

**Commented [VM22567R566]:** Edits to address this comment will be reflected in next exposure

**Commented [X568]:** This section states that "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally." This text seems to directly contradict Section II. Reserve Requirements 6.H.2 which states "When advantageous, policyholders will commence living benefit payouts if not started yet.". We suggest revising 6.H.2 to align with the text of 10.D.8.

efficiency in a financially rational manner nor assume that contract holders will always act irrationally. These extreme assumptions may be used for modeling efficiency if the result is more conservative.

E. Dynamic Assumptions

1. Consistent with the concept of prudent estimate assumptions described earlier, the liability model should incorporate margins for uncertainty for all risk factors that are not dynamic (i.e., the non-scenario tested assumptions) and are assumed not to vary according to the financial interest of the contract holder stochastically modeled.
2. The company should exercise care in using static assumptions when it would be more natural and reasonable appropriate to use a dynamic model or other scenario-dependent formulation for behavior. With due regard to considerations of materiality and practicality allowance for appropriate simplifications, approximations and modeling efficiency techniques, the use of dynamic models is encouraged, but not mandatory. Static assumptions Risk factors that are not scenario tested but could reasonably be expected to vary according to a stochastic process, or future states of the world (especially in response to economic drivers), may require higher margins and/or signal a need for higher margins for certain other assumptions.
3. Risk factors that are modeled dynamically should encompass the plausible range of behavior consistent with the economic scenarios and other variables in the model, including the non-scenario tested assumptions. The company shall test the sensitivity of results to understand the materiality of making alternate assumptions and follow the guidance discussed above on setting assumptions for sensitive behaviors.

F. Consistency with the CTE Level

1. All behaviors (i.e., dynamic, formulaic and non-scenario tested) should be consistent with the scenarios used in the CTE calculations (generally, the top 30% of the loss distribution). To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the company should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use prudent estimate assumptions for behavior that are reasonable and appropriate in such scenarios. For non-variable fixed annuities, these "valuation" scenarios would typically display one or more of the following attributes:
  - a. Declining, increasing and/or volatile index values, where applicable.
  - b. Price gaps and/or liquidity constraints.
  - c. Rapidly changing Volatile interest rates or persistently low interest rates.
  - d. Volatile credit spreads.
2. The behavior assumptions should be logical and consistent both individually and in aggregate, especially in the scenarios that govern the results. In other words, the company should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:

Commented [X569]: Recommend replacing "dynamic" with "stochastic." Risk factors with dynamic assumptions still need margins (although for an assumption that was part fixed and part dynamic, only one piece may have the margin but still the risk factor would have a margin).

Commented [VM22570R569]: Edits to address this comment will be reflected in next exposure

Commented [X571]: Suggest replacing "Risk factors that are not scenario tested but" with "Static assumptions that" to improve clarity in the wording.

Commented [VM22572R571]: Edits to address this comment will be reflected in next exposure

Commented [X573]: Get rid of some of the vague adjectives and be consistent with VM framework for simplifications.

Commented [VM22574R573]: Edits to address this comment will be reflected in next exposure

Commented [CD575]: "non-variable"?

Commented [VM22576R575]: Edits to address this comment will be reflected in next exposure

Commented [X577]: Editorial clarification to cover scenarios for all products/guarantees in scope

Commented [VM22578R577]: Edits to address this comment will be reflected in next exposure

Commented [X579]: Editorial for consistency with (a) above

Commented [VM22580R579]: Edits to address this comment will be reflected in next exposure

Commented [X581]: Suggesting deleting as we are not aware of dynamic credit spreads typically being modeled.

Commented [VM22582R581]: Edits to address this comment will be reflected in next exposure

- a. Remain logically and internally consistent across the scenarios tested.
  - b. Represent plausible outcomes.
  - c. Lead to appropriate, but not excessive, asset requirements.
4. The company should remember that the continuum of “plausibility” should not be confined or constrained to the outcomes and events exhibited by historic experience.
5. Companies should attempt to track experience for all assumptions that materially affect their risk profiles by collecting and maintaining the data required to conduct credible and meaningful studies of contract holder behavior.
- G. Additional Considerations and Requirements for Assumptions Applicable to Guaranteed Living Benefits

Experience for contracts without guaranteed living benefits may be of limited use in setting a lapse assumption for contracts with in-the-money or at-the-money guaranteed living benefits. Such experience may only be used if it is appropriate (e.g., lapse experience on contracts without a living benefit may have relevance to the early durations of contracts with living benefits) and relevant to the business.

H. Policy Loans

If policy loans are applicable for the block of business, the company shall determine cash flows for each projection interval for policy loan assets by modeling existing loan balances either explicitly or by substituting assets that are a proxy for policy loans (e.g., bonds, cash, etc.) subject to the following:

1. If the company substitutes assets that are a proxy for policy loans, the company must demonstrate that such substitution:
  - a. Produces reserves that are no less than those that would be produced by modeling existing loan balances explicitly.
  - b. Complies with the contract holder behavior requirements stated in Section 10.A to Section 10.G above in this section.
2. If the company models policy loans explicitly, the company shall:
  - a. Treat policy loan activity as an aspect of contract holder behavior and subject to the requirements above in this section.
  - b. Assign loan balances either to exactly match each policy's contract's utilization or to reflect average utilization over a model segment or sub-segments if the results are materially similar.
  - c. Model policy loan interest in a manner consistent with policy contract provisions and with the scenario. Include interest paid in cash as a positive policy loan cash flow in that projection interval, but do not include interest added to the loan balance as a policy loan cash flow. (The increased balance will require increased repayment cash flows in future projection intervals.)

Commented [CD583]: Okay to keep the term "Policy Loans"

Commented [VM22584R583]: Edits to address this comment will be reflected in next exposure

Commented [X585]: Clarify reference to be more specific

Commented [VM22586R585]: Edits to address this comment will be reflected in next exposure

Commented [X587]: Editorial - VM-22 should consistently use contracts

Commented [VM22588R587]: Edits to address this comment will be reflected in next exposure

Commented [CD589]: "contract's"

Commented [VM22590R589]: Edits to address this comment will be reflected in next exposure

Commented [X591]: We have concern that reflecting average utilization may have material impact on benefit projections. Recommend adding "if the results are materially similar". This change is also applied to VM-20 and added to VM-21.

Commented [VM22592R591]: Edits to address this comment will be reflected in next exposure

Commented [X593]: Editorial - VM-22 should consistently use contracts

Commented [VM22594R593]: Edits to address this comment will be reflected in next exposure

Commented [CD595]: "contract"

Commented [VM22596R595]: Edits to address this comment will be reflected in next exposure

- d. Model policy loan principal repayments, including those that occur automatically upon death or surrender. Include policy loan principal repayments as a positive policy loan cash flow, per Section 4.A.1.h.
- e. Model ~~additional~~ policy loan principal. Include additional policy loan principal as a negative policy loan cash flow, per Section 4.A.1.h (but do not include interest added to the loan balance as a negative policy loan cash flow).
- f. Model any investment expenses allocated to policy loans and include them either with negative policy loan cash flows or insurance expense cash flows.

I. Non-Guaranteed Elements

Consistent with the definition in VM-01, Non-Guaranteed Elements (NGEs) are elements within a contract that affect ~~policy contract~~ costs or values and are not guaranteed or not determined at issue. NGEs consist of elements affecting contract holder costs or values that are both established and subject to change at the discretion of the insurer.

Examples of NGEs specific to non-variable~~fixed~~ annuities include but are not limited to the following: ~~fixed~~ the credited rates on fixed accounts, index parameters (caps, spreads, participation rates, etc.), rider fees, rider benefit features being subject to change (rollup rates, rollup period, etc.), account value charges, and dividends under participating policies or contracts.

1. Except as noted below in Section ~~10.4.5~~, the company shall include NGE in the models to project future cash flows beyond the time the company has authorized their payment or crediting.
2. The projected NGE shall reflect factors that include, but are not limited to, the following (not all of these factors will necessarily be present in all situations):
  - a. The nature of contractual guarantees.
  - b. The company's past NGE practices and established NGE policies.
  - c. The timing of any change in NGE relative to the date of recognition of a change in experience.
  - d. The benefits and risks to the company of continuing to authorize NGE.
3. Projected NGE shall be established based on projected experience consistent with how actual NGE are determined.
4. Projected levels of NGE in the cash-flow model must be consistent with the experience assumptions used in each scenario. Contract holder behavior assumptions in the model must be consistent with the NGE assumed in the model.
5. The company may exclude any portion of an NGE that:
  - a. Is not based on some aspect of the ~~policy's or~~ contract's experience.
  - b. Is authorized by the board of directors and documented in the board minutes, where the documentation includes the amount of the NGE that arises from other sources.

However, if the board has guaranteed a portion of the NGE into the future, the company must model that amount. In other words, the company cannot exclude

**Commented [CD597]:** The wording of "additional" is unclear. Does this mean maintaining a certain level of policy loan utilization throughout the projection (i.e., adding principal as repayments are made), or actually increasing policy loan utilization (i.e., adding more principal) over time? The former would seem more appropriate than the latter.

**Commented [VM22598R597]:** Edits to address this comment will be reflected in next exposure

**Commented [X599]:** Clarification

**Commented [VM22600R599]:** Edits to address this comment will be reflected in next exposure

**Commented [CD601]:** suggest: "contract holder"

**Commented [VM22602R601]:** Edits to address this comment will be reflected in next exposure

**Commented [X603]:** Editorial - VM-22 should consistently use contracts

**Commented [VM22604R603]:** Edits to address this comment will be reflected in next exposure

**Commented [CD605]:** suggest: "are not"

**Commented [VM22606R605]:** Edits to address this comment will be reflected in next exposure

**Commented [CD607]:** suggest: "non-variable annuities"

**Commented [VM22608R607]:** Edits to address this comment will be reflected in next exposure

**Commented [X609]:** Clarity

**Commented [VM22610R609]:** Edits to address this comment will be reflected in next exposure

**Commented [X611]:** Correct section reference

**Commented [VM22612R611]:** Edits to address this comment will be reflected in next exposure

**Commented [CD613]:** delete "policy's or"

**Commented [VM22614R613]:** Edits to address this comment will be reflected in next exposure

**Commented [X615]:** Why does being authorized mean it can be excluded? This seems backwards. Does this mean it has already transpired?

from its model any NGE that the board has guaranteed for future years, even if it could have otherwise excluded them, based on this subsection.

6. The liability for contract holder dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date is reported separately from the statutory reserve. The contract holder dividends that give rise to this dividend liability as of the valuation date may or may not be included in the cash-flow model at the company's option.
  - a. If the contract holder dividends that give rise to the dividend liability are not included in the cash-flow model, then no adjustment is needed to the resulting ~~aggregate stochastic reserve~~ SR.
  - b. If the contract holder dividends that give rise to the dividend liability are included in the cash-flow model, then the resulting ~~aggregate stochastic reserve~~ SR should be reduced by the amount of the dividend liability.
7. All projected cash flows associated with NGEs shall reflect margins for adverse deviations and estimation error in prudent estimate assumptions.

Commented [CD616]: delete "aggregate"

Commented [VM22617R616]: Edits to address this comment will be reflected in next exposure

Commented [CD618]: delete "aggregate"

Commented [VM22619R618]: Edits to address this comment will be reflected in next exposure



Section 11: Guidance and Requirements for Setting Prudent Estimate Mortality Assumptions

A. Overview

1. Intent

The guidance and requirements in this section apply to setting prudent estimate mortality assumptions when determining the stochastic reserve. SR. The intent is for prudent estimate mortality assumptions to be based on facts, circumstances and appropriate actuarial practice, with only a limited role for unsupported actuarial judgment. (Where more than one approach to appropriate actuarial practice exists, the company should select the practice that the company deems most appropriate under the circumstances.)

2. Description

Prudent estimate mortality assumptions shall be determined by first developing expected mortality curves based on either available experience or published tables. Where necessary, margins shall be applied to the experience to reflect data uncertainty. The expected mortality curves shall then be adjusted based on the credibility of the experience used to determine the expected mortality curve. Section 11.B addresses guidance and requirements for determining expected mortality curves, and Section 11.C addresses guidance and requirements for adjusting the expected mortality curves to determine prudent estimate mortality.

Finally, the credibility-adjusted tables shall be adjusted for mortality improvement (where such adjustment is permitted or required) using the guidance and requirements in Section 11.D.

3. Business Segments

For purposes of setting prudent estimate mortality assumptions, the products falling under the scope of these requirements shall be grouped into business segments with different mortality assumptions. The grouping, at a minimum, should differentiate between payout annuities or deferred annuity contracts that contain GLBs, and deferred annuity contracts with no guaranteed benefits or only GMDBs. Where appropriate, the grouping should also differentiate between segments which are known or expected to contain contract holders with sociodemographic, geographic, or health factors reasonably expected to impact the mortality assumptions for the segment (e.g., annuitants drawn from different countries, geographic areas, industry groups, or impaired lives on individually underwritten contracts such as structured settlements). The grouping should also generally follow the pricing, marketing, management and/or reinsurance programs of the company.

**Guidance Note:** This paragraph contemplates situations where it may be appropriate to differentiate mortality assumptions by segment or even by contract due to varying sociodemographic, geographic, or health factors. Particularly, though not exclusively, in the context of group payout annuity contracts, companies may have credible, contract-specific mortality experience data or relevant pooled data from annuitants drawn from similar industries or geographies that may be used to sub-divide inforce blocks into business segments for purposes of setting prudent estimate mortality assumptions.

For example, a company may sell group PRT contracts both to union plans in the U.S. and to private single-employer plans in another country. While both are “PRT contracts,” it would be appropriate to differentiate them for mortality assumption purposes, similar to

**Commented [X620]:** Specific requirements will require further discussion, particularly what if any industry experience is identified for the SPA. Ideally, updated and appropriate assumptions should be used for better alignment and to avoid any false positives flagged as an outlier by the SPA.

**Commented [VM22621R620]:** Will address SPA separately

**Commented [X622]:** Recommend removing reference to actuarial judgment being “unsupported” from VM-21 and VM-22 because actuarial judgment should always be supportable - it is “judgment” not an arbitrary decision.

how payout annuities vs. deferred annuities are distinguished.

**Guidance Note:** Distinct mortality or liability assumptions among different contracts within a group of contracts does not in itself preclude the group of contracts from being aggregated for the purposes of the broader stochastic reserve calculation.

4. Margin for Data Uncertainty

The expected mortality curves that are determined in Section 11.B may need to include a margin for data uncertainty. The margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the provision for uncertainty to mortality. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment.

For purposes of this section, if mortality must be increased (decreased) to provide for uncertainty, the business segment is referred to as a plus (minus) mortality (longevity) segment.

It may be necessary, because of a change in the mortality risk profile of the segment, to reclassify a business segment from a mortality (longevity) plus (minus) segment to a longevity (mortality) minus (plus) segment to the extent compliance with this section requires such a reclassification. For example, a segment could require reclassification depending on whether it is gross or net of reinsurance.

B. Determination of Expected Mortality Curves

1. Experience Data

In determining expected mortality curves, the company shall use actual experience data directly applicable to the business segment (i.e., direct data) if it is available. In the absence of direct data, the company should then look to use data from a segment that is similar to the business segment (i.e., other than direct experience). See Section 11.B.2 for additional considerations. Finally, if there is no data, the company shall use the applicable table, as required in Section 11.B.3.

2. Data Other Than Direct Experience

Adjustments shall be applied to the data to reflect differences between the business segments, and margins shall be applied to the adjusted expected mortality curves to reflect the data uncertainty associated with using data from a similar but not identical business segment.

To the extent the mortality of a business segment is reinsured, any mortality charges that are consistent with the company's own pricing and applicable to a substantial portion of the mortality risk also may be a reasonable starting point for the determination of the company's expected mortality curves.

3. No Data Requirements

**Commented [X623]:** Recommend deleting this guidance note since it is unnecessary - there is no such restriction for any of VM-20, VM-21 or VM-22. It would be an absurd level of granular distinction, such that it is not clear you could actually perform the projection, given that assumptions vary by attained age, etc.

**Commented [VM22624R623]:** Edits to address this comment will be reflected in next exposure

**Commented [X625]:** Terming the segments "mortality (longevity) segments" would be easier to understand than "plus (minus) segments".

**Commented [VM22626R625]:** Edits to address this comment will be reflected in next exposure

**Commented [X627]:** It is unclear how to interpretate the statement and how to review it for both VM-21 and VM-22. If a company reinsures GMWGB riders, then does it mean that on a net basis the segment would no longer be considered as minus? So, there would be distinct designations for the pre and post reinsurance runs? Recommend discussing the statement and adding additional language or a guidance note to make it clear.

**Commented [X628]:** Delete period, it is a typo

**Commented [VM22629R628]:** Edits to address this comment will be reflected in next exposure

**Commented [X630]:** Does this need to be edited to be consistent with "little or no" data?

- i. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no less than:

[2021 SOA Deferred Annuity Mortality Table] with [Projection Scale G2] for individual deferred annuities that do not contain guaranteed living benefits

$$q_x^{20XX+n} = q_x^{20XX}(1 - G2_x)^n$$

- ii. When little or no experience or information is available on a business segment, the company shall use expected mortality curves that would produce expected deaths no greater than:

- a. [The appropriate percentage ( $F_x$ ) from Table 11.1 applied to the 2012 IAM Basic Mortality Table] with [Projection Scale G2] for individual payout annuity contracts and deferred annuity contracts with guaranteed living benefits

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n * F_x$$

- b. [1983 Table "a"] for structured settlements or other contracts with impaired mortality

- c. [1994 GAR Table] with [Projection Scale AA] for group annuities

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

Table 11.1

Attained Age (x)	$F_x$
<=65	80.0%
66	81.5%
67	83.0%
68	84.5%
69	86.0%
70	87.5%
71	89.0%
72	90.5%
73	92.0%
74	93.5%
75	95.0%
76	96.5%
77	98.0%
78	99.5%
79	101.0%
80	102.5%
81	104.0%

Commented [X631]: Section 11.B.3.i only has one item "a". There is no need to specifically have a single item "a". Recommend delete the notation "a" and have "Section 11.B.3.i" only.

Commented [VM22632R631]: Will be updated upon SPA assumption development

Commented [X633]: For PRT an assumption based on third-party data provider would be better than the industry table to get contract specific mortality assumptions. Is this permitted? The guidance note in A.3 seems to get at this but it's not clear in B.3.i.c whether this is allowed. This is an important distinction as PRT population can vary from those populations the tables are based upon.

Commented [VM22634R633]: Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

Commented [X635]: The 1983 Table "a" and 1994 GAR are used for structured settlements and group annuities, respectively. These tables seem to be out of date. If Standard Projected Amount work develops more granular and up to date tables, should these tables be updated to use consistent tables?

Commented [VM22636R635]: Will be updated upon SPA assumption development

Commented [X637]: The percentage factors ( $F_x$ ) are over 100% from attained age 79 to age 104. Is it appropriate to set the factors above 100% for the older ages with no credibility?

Commented [VM22638R637]: Will be updated upon SPA assumption development

Commented [CD639]: does the  $F_x$  factor need any consideration for FIAs with GLBs?

Commented [VM22640R639]: Will be updated upon SPA assumption development

82	105.5%	
83	107.0%	
84	108.5%	
85	110.0%	
86	110.0%	
87	110.0%	
88	110.0%	
89	110.0%	
90	110.0%	
91	110.0%	
92	110.0%	
93	110.0%	
94	110.0%	
95	110.0%	
96	109.0%	
97	108.0%	
98	107.0%	
99	106.0%	
100	105.0%	
101	104.0%	
102	103.0%	
103	102.0%	
104	101.0%	
>=105	100.0%	

iii. For a business segment with non-U.S. insureds, when little or no experience or information is available on a business segment, an established industry or national mortality table and mortality improvement scale may be used, with approval from the domiciliary commissioner.

4. Additional Considerations Involving Data

The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., direct data discussed in Section 11.B.1 or other than direct data discussed in Section 11.B.2).

a. Underreporting of Deaths

Mortality data shall be examined for possible underreporting of deaths. Adjustments shall be made to the data if there is any evidence of underreporting. Alternatively, exposure by lives or amounts on contracts for which death benefits were in the money may be used to determine expected mortality curves. Underreporting on such exposures should be minimal; however, this reduced subset of data will have less credibility.

b. Experience by Contract Duration

Experience of a plus segment shall be examined to determine if mortality by contract duration increases materially due to selection at issue. In the absence of information, the company shall assume that expected mortality will increase by

**Commented [X641]:** The phrase "When little or no experience or information is available on a business segment" is not included, unlike in (i) and (ii) of the same sub-section. It appears to be the intent that this is the only situation in which this would apply, but it would be helpful to make this explicit.

**Commented [VM22642R641]:** Edits to address this comment will be reflected in next exposure

**Commented [X643]:** Reference to the MI scale missing for international business

**Commented [VM22644R643]:** Edits to address this comment will be reflected in next exposure

contract duration for an appropriate select period. As an alternative, if the company determines that mortality is affected by selection, the company could apply margins to the expected mortality in such a way that the actual mortality modeled does not depend on contract duration.

c. Modification and Relevance of Data

Even for a large company, the quantity of life exposures and deaths are such that a significant amount of smoothing may be required to determine expected mortality curves from mortality experience. Expected mortality curves, when applied to the recent historic exposures (e.g., three to seven years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments.

In determining expected mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine expected mortality curves should be documented.

d. Other Considerations

In determining expected mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

C. Adjustment for Credibility to Determine Prudent Estimate Mortality

1. Adjustment for Credibility

The expected mortality curves determined in Section 11.B shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at prudent estimate mortality. The adjustment for credibility shall result in blending the expected mortality curves including margins for uncertainty with the mortality assumption assumptions described in Section 11.B.3. The approach used to adjust the curves shall suitably account for credibility.

**Guidance Note:** For example, when credibility is zero, an appropriate approach should result in a mortality assumption consistent with 100% of the industry mortality assumption described in Section 11.B.3 ~~table~~ used in the blending.

2. Adjustment of Statutory Valuation Industry Mortality for Improvement

For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be and the industry mortality table for a minus segment must be adjusted for mortality improvement. Such adjustment shall reflect the mortality improvement scale described in Section 11.B.3 from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the expected mortality curves.

3. Credibility Procedure

The credibility procedure used shall:

a. Produce results that are reasonable.

**Commented [X645]:** Both plan and industry data should get weighted for business such as PRT. This text says to blend with prescribed tables, but that might not make sense unless additional experience data was unavailable.

**Commented [VM22646R645]:** Subgroup voted to only allow a prescribed table (to be determined upon SPA development) and not permit the use of third-party data provider upon a limited credibility

**Commented [X647]:** Clarification

**Commented [VM22648R647]:** Edits to address this comment will be reflected in next exposure

**Commented [X649]:** Editorial

**Commented [VM22650R649]:** Edits to address this comment will be reflected in next exposure

**Commented [X651]:** The “statutory valuation” is struck out in the guidance note. Recommend replacing “statutory valuation” with either “reference of Section 11.B.3” or “industry”. Otherwise, it is a vague reference since we have both a company mortality table and an industry mortality table.

**Commented [VM22652R651]:** Edits to address this comment will be reflected in next exposure

**Commented [CD653]:** need to reference “the mortality assumption described in Section 11.B.3” here? Otherwise, the sentence is unclear.

**Commented [VM22654R653]:** Edits to address this comment will be reflected in next exposure

**Commented [X655]:** Mortality improvement should be consistent with the underlying tables used, so we would suggest this being based on available experience subject to appropriate guardrails.

**Commented [X656]:** “Statutory Valuation” was stricken from all the body, but left in this title. Consider replacing with “industry”.

**Commented [VM22657R656]:** Edits to address this comment will be reflected in next exposure

**Commented [CD658]:** for consistency, need to delete this reference to “Statutory Valuation”

**Commented [VM22659R658]:** Edits to address this comment will be reflected in next exposure

- b. Not tend to bias the results in any material way.
  - c. Be practical to implement.
  - d. Give consideration to the need to balance responsiveness and stability.
  - e. Take into account not only the level of aggregate claims but the shape of the mortality curve.
  - f. Contain criteria for full credibility and partial credibility that have a sound statistical basis and be appropriately applied.
4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement

The credibility-adjusted table used for plus segments may be and the credibility adjusted table used for minus segments must be adjusted for mortality improvement using the applicable mortality improvement scale described in Section 11.B.3 from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement beyond the valuation date is discussed in Section 11.D.

D. Future Mortality Improvement

The mortality assumption resulting from the requirements of Section 11.C shall be adjusted for mortality improvements beyond the valuation date if such an adjustment would serve to increase the resulting ~~stochastic reserve~~SR. If such an adjustment would reduce the ~~stochastic reserve~~SR, such assumptions are permitted, but not required. In either case, the assumption must be based on current relevant data with a margin for uncertainty (increasing assumed rates of improvement if that results in a higher reserve or reducing them otherwise).

Section 12: Other Guidance and Requirements for Assumptions

A. Overview

This section provides guidance and requirements in general for setting prudent estimate assumptions when determining either the SR or DR. It also provides specific guidance and requirements for expense assumptions.

B. General Assumption Requirements

1. The company shall use prudent estimate assumptions for risk factors that are not stochastically modeled by applying margins to the anticipated experience assumptions if such risk factors have been categorized as material risks by following Section 1.B Principle 3 and requirements in Section 12.C.
2. The company shall establish the prudent estimate assumptions for risk factors in compliance with the requirements in Section 12 of Model #820 and must periodically review and update the assumptions as appropriate in accordance with these requirements.
3. The company shall model the following risk factors stochastically unless the company elects the stochastic modeling exclusion defined in Section 7:
  - a. Interest rate movements (i.e., Treasury interest rate curves).
  - b. Equity performance (e.g., Standard & Poor's 500 index [S&P 500] returns and returns of other equity investments).
4. If the company elects to stochastically model risk factors in addition to the economic scenarios, the requirements in this section for determining prudent estimate assumptions for these risk factors do not apply.

**Guidance Note:** It is expected that companies will not stochastically model risk factors other than the economic scenarios, such as contract holder behavior or mortality, until VM-22 has more specific guidance and requirements available. Companies shall discuss with domiciliary regulators if they wish to stochastically model other risk factors.

5. The company shall use its own experience, if relevant and credible, to establish an anticipated experience assumption for any risk factor. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the anticipated experience assumption, making modifications as needed to reflect the circumstances of the company.
  - a. For risk factors (such as mortality) to which statistical credibility theory may be appropriately applied, the company shall establish anticipated experience assumptions for the risk factor by combining relevant company experience with industry experience data, tables or other applicable data in a manner that is consistent with credibility theory and accepted actuarial practice.

**Commented [X660]:** We believe discussion of allocation of appropriate reserves should be analyzed as part of the field study.

**Commented [VM22661R660]:** The VM-22 Subgroup has no objections to waiting until after the field study to determine the allocation approach.

**Commented [X662]:** Need to add a Section 12 for general guidance on prudent assumption setting and on expenses. For VM-21, APF 2021-11 is currently exposed. Should be consistent with that APF, after any tweaks are made. [https://content.naic.org/sites/default/files/inline-files/APF%2021-11%20VM21%20assumptions\\_012021.pdf](https://content.naic.org/sites/default/files/inline-files/APF%2021-11%20VM21%20assumptions_012021.pdf)

**Commented [VM22663R662]:** Subgroup agreed on adding this as a new Section 12.

- b. For risk factors (such as utilization of guaranteed living benefits) that do not lend themselves to the use of statistical credibility theory, and for risk factors (such as some of the lapse assumptions) to which statistical credibility theory can be appropriately applied but cannot currently be applied due to lack of industry data, the company shall establish anticipated experience assumptions in a manner that is consistent with accepted actuarial practice and that reflects any available relevant company experience, any available relevant industry experience, or any other experience data that are available and relevant. Such techniques include:
    - i. Adopting standard assumptions published by professional, industry or regulatory organizations to the extent they reflect any available relevant company experience or reasonable expectations.
    - ii. Applying factors to relevant industry experience tables or other relevant data to reflect any available relevant company experience and differences in expected experience from that underlying the base tables or data due to differences between the risk characteristics of the company experience and the risk characteristics of the experience underlying the base tables or data.
    - iii. Blending any available relevant company experience with any available relevant industry experience and/or other applicable data using weightings established in a manner that is consistent with accepted actuarial practice and that reflects the risk characteristics of the underlying contracts and/or company practices.
  - c. For risk factors that have limited or no experience or other applicable data to draw upon, the assumptions shall be established using sound actuarial judgment and the most relevant data available, if such data exists.
  - d. For any assumption that is set in accordance with the requirements of Section 12.B.5.c, the qualified actuary to whom responsibility for this group of contracts is assigned shall use sensitivity testing and disclose the analysis performed to ensure that the assumption is set at the conservative end of the plausible range.
  - e. The qualified actuary, to whom responsibility for this group of contracts is assigned, shall annually review relevant emerging experience for the purpose of assessing the appropriateness of the anticipated experience assumption. If the results of statistical or other testing indicate that previously anticipated experience for a given factor is inadequate, then the qualified actuary shall set a new, adequate, anticipated experience assumption for the factor.
6. The company shall sensitivity test risk factors that are not stochastically modeled and examine the impact on the stochastic reserve. The company shall update the sensitivity tests periodically as appropriate. The company may update the tests less frequently, but no less than every 3 years, when the tests show less sensitivity of the stochastic reserve to changes in the assumptions being tested or the experience is not changing rapidly. Providing there is no material impact on the results of the sensitivity testing, the company



may perform sensitivity testing:

- a. Using samples of the contracts in force rather than performing the entire valuation for each alternative assumption set.
- b. Using data from prior periods.

**Guidance Note:** Sensitivity testing every risk factor on an annual basis is not required. For some risk factors, it may be reasonable, in lieu of sensitivity testing, to employ statistical measures for margins, such as adding one or more standard deviations to the anticipated experience assumption.

7. The company shall vary the prudent estimate assumptions from scenario to scenario within the stochastic reserve calculation in an appropriate manner to reflect the scenario-dependent risks.

#### C. Assumption Margins

The company shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed, subject to the following:

1. The level of margin applied to the anticipated experience assumptions may be determined in aggregate or independently as discussed in Section 1.B Principle 3. It is not permissible to set a margin less toward the conservative end of the spectrum to recognize, in whole or in part, implicit or prescribed margins that are present, or are believed to be present, in other risk factors.

Risks that are stochastically modeled (e.g., interest rates, equity returns) or have prescribed margins or guardrails (e.g., assets, revenue sharing) shall be considered material risks. Other risks generally considered to be material include, but are not limited to, mortality, contract holder behavior, maintenance and overhead expenses, inflation and implied volatility. In some cases, the list of material risks may also include acquisition expenses, partial withdrawals, policy loans, annuitizations, account transfers and deposits, and/or option elections that contain an element of anti-selection.

2. The greater the uncertainty in the anticipated experience assumption, the larger the required margin, with the margin added or subtracted as needed to produce a larger Sr or DR than would otherwise result. For example, the company shall use a larger margin when:

- a. The experience data have less relevance or lower credibility.
- b. The experience data are of lower quality, such as incomplete, internally inconsistent or not current.
- c. There is doubt about the reliability of the anticipated experience assumption, such as, but not limited to, recent changes in circumstances or changes in company policies.
- d. There are constraints in the modeling that limit an effective reflection of the risk factor.

Commented [X664]: [Edit for VM-22 vs. VM-21?](#)

Commented [VM22665R664]: Will include this language in the next exposure and will solicit any comments

3. In complying with the sensitivity testing requirements in Section 12.B.6 above, greater analysis and more detailed justification are needed to determine the level of uncertainty when establishing margins for risk factors that produce greater sensitivity on the stochastic reserve.
4. A margin is permitted but not required for assumptions that do not represent material risks.
5. A margin should reflect the magnitude of fluctuations in historical experience of the company for the risk factor, as appropriate.
6. The company shall apply the method used to determine the margin consistently on each valuation date but is permitted to change the method from the prior year if the rationale for the change and the impact on the stochastic reserve is disclosed.

#### D. Expense Assumptions

##### 1. General Prudent Estimate Expense Assumption Requirements

In determining prudent estimate expense assumptions, the company:

- a. May spread certain information technology development costs and other capital expenditures over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles.

**Guidance Note:** Care should be taken with regard to the potential interaction with the inflation assumption below.

- b. Shall assume that the company is a going concern.
- c. Shall choose an appropriate expense basis that properly aligns the actual expense to the assumption. If values are not significant, they may be aggregated into a different base assumption.

**Guidance Note:** For example, death benefit expenses should be modeled with an expense assumption that is per death incurred.

- d. Shall reflect the impact of inflation.
- e. Shall not assume future expense improvements.
- f. Shall not include assumptions for federal income taxes (and expenses paid to provide fraternal benefits in lieu of federal income taxes) and foreign income taxes.
- g. Shall use assumptions that are consistent with other related assumptions.
- h. Shall use fully allocated expenses.

**Guidance Note:** Expense assumptions should reflect the direct costs associated with the block of contracts being modeled, as well as indirect costs and overhead costs that have been allocated to the modeled contracts.

- i. Shall allocate expenses using an allocation method that is consistent across

company lines of business. Such allocation must be determined in a manner that is within the range of actuarial practice and methodology and consistent with applicable ASOPs. Allocations may not be done for the purpose of decreasing the stochastic reserve.

- j. Shall reflect expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger in the expense assumption only when any future costs associated with achieving the efficiencies are also recognized.

**Guidance Note:** For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past, then there would be no future expenses to reflect in the valuation.

- k. Shall reflect the direct costs associated with the contracts being modeled, as well as an appropriate portion of indirect costs and overhead (i.e., expense assumptions representing fully allocated expenses should be used), including expenses categorized in the annual statement as “taxes, licenses and fees” (Exhibit 3 of the annual statement) in the expense assumption.

- l. Shall include acquisition expenses associated with business in force as of the valuation date and significant non-recurring expenses expected to be incurred after the valuation date in the expense assumption.

- m. For contracts sold under a new policy form or due to entry into a new product line, the company shall use expense factors that are consistent with the expense factors used to determine anticipated experience assumptions for contracts from an existing block of mature contracts taking into account:

i. Any differences in the expected long-term expense levels between the block of new contacts and the block of mature contracts.

ii. That all expenses must be fully allocated as required under Section 12.D.1.h above.

2. Margins for Prudent Estimate Expense Assumptions

The company shall determine margins for expense assumptions following Section 12.C.

Section 13: Allocation of Aggregate Reserves to the Contract Level

Section 3.F states that the aggregate reserve shall be allocated to the contracts falling within the scope of these requirements. That allocation should be done for both the pre- and post-reinsurance ceded reserves. Contracts that have passed the stochastic exclusion test as defined in Section 7.B will not be included in the allocation of the aggregate reserve. For the purpose of this section, if a contract does not have a cash surrender value, then the cash surrender value is assumed to be zero.

Contracts for which the Deterministic Certification Option is elected in Section 7.E are intended to use the methodology described in this section to allocate aggregate reserves in excess of the cash surrender value to individual contracts.

The contract-level reserve for each contract shall be the sum of the following:

- A. The contract's cash surrender value.

Drafting Note: The American Academy of Actuaries Annuity Reserves and Capital Work Group is including two potential options for allocating the excess portion of the aggregate reserve over cash surrender value: (1) Use the same approach as VM-21 (2) Allocate based on an actuarial present value calculation.

The Work Group did not reach a consensus between these two approaches, so wording for both is included in the text below. The Work Group recommends field testing both approaches and considering the results in determining future decisions.

**Option 1: VM-21 Approach**

- B. An allocated portion of the excess of the aggregate reserve over the aggregate cash surrender value shall be allocated to each contract based on a measure of the risk of that product relative to its cash surrender value in the context of the company's in force contracts (assuming zero cash value for contracts that do not contain such). The allocation shall be made separately for DR and SR. The measure of risk should consider the impact of risk mitigation programs, including hedge programs and reinsurance, that would affect the risk of the product. The specific method of assessing that risk and how it contributes to the company's aggregate reserve shall be defined by the company. The method should provide for an equitable allocation based on risk analysis.

**Commented [X666]:** This method only makes sense if done separately for the DR and SR.

- 1. As an example, consider a company with the results of the following three contracts:

Table 12.1: Sample Allocation of Aggregate Reserve

Contract (i)	1	2	3	Total
Cash Surrender Value, C	28	40	52	120
Risk adjusted measure, R	38	52	50	
Aggregate Reserve				140
Allocation Basis for the excess of the Aggregate Reserve over the Cash Surrender Value $A_i = \text{Max}(R_i - C_i, 0)$	10	12	0	22

Allocation of the excess of the Aggregate Reserve over the Cash Surrender Value $Li = (Ai) \sum Ai * [Aggregate Reserve - \sum Ci]$	9.09	10.91	0.00	20
Contract-level reserve $Ci + Li$	37.09	50.91	52.00	140.00

2. In this example, the Aggregate Reserve exceeds the aggregate Cash Surrender Value by 20. The 20 is allocated proportionally across the three contracts based on the allocation basis of the larger of (i) zero; and (ii) a risk adjusted measure based on reserve principles. Therefore, contracts 1 and 2 receive 45% (9/22) and 55% (11/22), respectively, of the excess Aggregate Reserve. As Contract 3 presents no risk in excess of its cash surrender value, it does not receive an allocation of the excess Aggregate Reserve.

**Option 2: Actuarial Present Value Approach**

B. The excess of the aggregate reserve over the aggregate cash surrender value is allocated to policies based on a calculation of the actuarial present value of projected liability cash flows in excess of the cash surrender value:

1. Discount the liability cash flows at the NAER, pursuant to requirements in Section 4, for the scenario that produces the scenario reserve closest to, but not less than the ~~stochastic reserve~~ SR defined in Section 3.D.
  - a. Groups of contracts that elect the Deterministic Certification Option defined in Section 7.E shall use the NAER in the single scenario used to calculate the reserve to discount liability cash flows, as well as any cash flows that are scenario dependent.
2. If the actuarial present value is less than the cash surrender value, then the excess actuarial present value to be used for allocating the excess aggregate reserve over the cash value shall be floored at zero.
  - a. If all contracts have an excess actuarial present value that is floored at zero, then use the cash surrender value to allocate any excess aggregate reserve over the aggregate cash surrender value.
3. For projecting future liability cash flows, assume the same liability assumptions that were used to calculate the ~~stochastic reserve~~ SR defined in Section 3.D.
4. As a hypothetical example, consider a company with the results of the following five contracts:

**Commented [X667]:** This method depends on the NAER, so would not work for companies that use direct iteration.

**Commented [X668]:** This could give an unstable allocation if there is an even mix of products with different risk profiles, so that the tail is populated with some scenarios where Product A does poorly and some where Product B does poorly. The single scenario will only reflect the riskiness of one of the products.

**Commented [X669]:** Not just the NAER, but the cashflows are also scenario dependent.

**Commented [VM22670R669]:** Edits to address this comment will be reflected in next exposure

**Commented [CD671]:** "Section 3.D"

**Commented [VM22672R671]:** Edits to address this comment will be reflected in next exposure

Table 12.1: Hypothetical Sample Allocation of Aggregate Reserve

Contract	Example Product Type	CSV* (1)	Scenario APV (2)	Excess (Floored) of the scenario APV over CSV* (3) = $\text{Max}[(2)-(1), 0]$	Aggregate Reserve CTE 70 (4)	Excess of Aggregate Reserve over Aggregate CSV* (5) = $\text{Max}[(4 \text{ Total}) - (1 \text{ Total}), 0]$	Allocated Excess Reserve (6) = (3) x [(5 Total) / (3 Total)]	Total Contract Level Reserve (7) = (1) + (6)
Contract 1:	Indexed Annuity with no GLWB**	95.0	90.0	0.0			0.0	95.0
Contract 2:	Indexed Annuity with low benefit GLWB**	92.0	95.0	3.0			3.6	95.6
Contract 3:	Indexed Annuity with medium benefit GLWB**	90.0	100.0	10.0			12.0	102.0
Contract 4:	Indexed Annuity with high benefit GLWB**	88.0	105.0	17.0			20.4	108.4
Contract 5:	Fixed Life Contingent Payout Annuity	0.0	70.0	70.0			84.0	84.0
Total		365.0		100.0	485.0	120.0	120.0	485.0

\*Cash Surrender Value  
 \*\*Guaranteed Lifetime Withdrawal Benefit

**Guidance Note:** The actuarial present value (APV) in the section above is separate from the Guarantee Actuarial Present Value (GAPV) referred to in the additional standard projection amount calculation in VM-21. The GAPV is only applicable to guaranteed minimum benefits and uses prescribed liability assumptions. In contrast, the APV in this section applies to the entire contract, irrespective of whether guaranteed benefits are attached, and uses company prudent estimate liability assumptions.

Commented [CD673]: should be "Max[(2)-(1), 0]"

Commented [VM22674R673]: Edits to address this comment will be reflected in next exposure

Section 14: Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves

A. Purpose and Scope

1. These requirements define for single premium immediate annuity contracts and other similar contracts, certificates and contract features the statutory maximum valuation interest rate that complies with Model #820. These are the maximum interest rate assumption requirements to be used in the CARVM and for certain contracts, the CRVM. These requirements do not preclude the use of a lower valuation interest rate assumption by the company if such assumption produces statutory reserves at least as great as those calculated using the maximum rate defined herein.
2. The following categories of contracts, certificates and contract features, whether group or individual, including both life contingent and term certain only contracts, directly written or assumed through reinsurance, with the exception of benefits arising from variable annuities, are covered in this section, and all contracts not passing the SET covered by Sections 1 through 13 of VM-22, are covered Section 14 of VM-22:
  - a. Immediate annuity contracts issued after Dec. 31, 2017;
  - b. Deferred income annuity contracts issued after Dec. 31, 2017;
  - c. Structured settlements in payout or deferred status issued after Dec. 31, 2017;
  - d. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued after Dec. 31, 2017;
  - e. Fixed payout annuities resulting from the exercise of settlement options or annuitizations of host contracts issued during 2017, for fixed payouts commencing after Dec. 31, 2018, or, at the option of the company, for fixed payouts commencing after Dec. 31, 2017;
  - f. Supplementary contracts, excluding contracts with no scheduled payments (such as retained asset accounts and settlements at interest), issued after Dec. 31, 2017;
  - g. Fixed income payment streams, attributable to contingent deferred annuities (CDAs) issued after Dec. 31, 2017, once the underlying contract funds are exhausted;
  - h. Fixed income payment streams attributable to guaranteed living benefits associated with deferred annuity contracts issued after Dec. 31, 2017, once the contract funds are exhausted; and
  - i. Certificates with premium determination dates after Dec. 31, 2017, emanating from non-variable group annuity contracts specified in Model #820, Section 5.C.2, purchased for the purpose of providing certificate holders benefits upon their retirement.

**Guidance Note:** For Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f and Section 14.A.2.h above, there is no restriction on the type of contract that may give rise to the benefit.

3. Exemptions:
  - a. With the permission of the domiciliary commissioner, for the categories of annuity contracts, certificates and/or contract features in scope as outlined in Section 14.A.2.d, Section 14.A.2.e, Section 14.A.2.f, Section 14.A.2.g or Section 14.A.2.h, the

**Commented [X675]:** Under A.2: need to exclude contracts being covered by the earlier sections of VM-22 not passing the exclusion tests and need a clearer reference instead of "covered in this section"

**Commented [VM22676R675]:** Edits to address this comment will be reflected in next exposure

company may use the same maximum valuation interest rate used to value the payment stream in accordance with the guidance applicable to the host contract. In order to obtain such permission, the company must demonstrate that its investment policy and practices are consistent with this approach.

4. The maximum valuation interest rates for the contracts, certificates and contract features within the scope of Section 13.14 of VM-22 supersede those described in Appendix VM-A and Appendix VM-C, but they do not otherwise change how those appendices are to be interpreted. In particular, *Actuarial Guideline IX-B—Clarification of Methods Under Standard Valuation Law for Individual Single Premium Immediate Annuities, Any Deferred Payments Associated Therewith, Some Deferred Annuities and Structured Settlements Contracts* (AG-9-B) (see VM-C) provides guidance on valuation interest rates and is, therefore, superseded by these requirements for contracts, certificates and contract features in scope. Likewise, any valuation interest rate references in *Actuarial Guideline IX-C—Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives Under Individual Single Premium Immediate Annuities* (AG-9-C) (see VM-C) are also superseded by these requirements.

#### B. Definitions

1. The term “reference period” means the length of time used in assigning the Valuation Rate Bucket for the purpose of determining the statutory maximum valuation interest rate and is determined as follows:
  - a. For contracts, certificates or contract features with life contingencies and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the earlier of: i) the date of the last non-life-contingent payment under the contract, certificate or contract feature; and ii) the date of the first life-contingent payment under the contract, certificate or contract feature, or
  - b. For contracts, certificates or contract features with no life-contingent payments and substantially similar payments, the reference period is the length of time, rounded to the nearest year, from the premium determination date to the date of the last non-life-contingent payment under the contract, certificate or contract feature, or
  - c. For contracts, certificates or contract features where the payments are not substantially similar, the actuary should apply prudent judgment and select the Valuation Rate Bucket with Macaulay duration that is a best fit to the Macaulay duration of the payments in question.

**Guidance Note:** Contracts with installment refunds or similar features should consider the length of the installment period calculated from the premium determination date as the non-life contingent period for the purpose of determining the reference period.

**Guidance Note:** The determination in Section 13.14.B.1.c above shall be made based on the materiality of the payments that are not substantially similar relative to the life-contingent payments.

2. The term “jumbo contract” means a contract with an initial consideration equal to or greater than \$250 million. Considerations for contracts issued by an insurer to the same contract holder within 90 days shall be combined for purposes of determining whether the contracts meet this threshold.

**Guidance Note:** If multiple contracts meet this criterion in aggregate, then each contract is a jumbo contract.



3. The term “non-jumbo contract” means a contract that does not meet the definition of a jumbo contract.
4. The term “premium determination date” means the date as of which the valuation interest rate for the contract, certificate or contract feature being valued is determined.
5. The term “initial age” means the age of the annuitant as of his or her age last birthday relative to the premium determination date. For joint life contracts, certificates or contract features, the “initial age” means the initial age of the younger annuitant. If a contract, certificate or contract feature for an annuitant is being valued on a standard mortality table as an impaired annuitant, “initial age” means the rated age. If a contract, certificate or contract feature is being valued on a substandard mortality basis, “initial age” means an equivalent rated age.
6. The term “Table X spreads” means the prescribed VM-22 Section ~~13~~<sup>14</sup> current market benchmark spreads for the quarter prior to the premium determination date, as published on the Industry tab of the NAIC website. The process used to determine Table X spreads is the same as that specified in VM-20 Appendix 2.D for Table F, except that JP Morgan and Bank of America bond spreads are averaged over the quarter rather than the last business day of the month.
7. The term “expected default cost” means a vector of annual default costs by weighted average life. This is calculated as a weighted average of the VM-20 Table A prescribed annual default costs published on the Industry tab of the NAIC website in effect for the quarter prior to the premium determination date, using the prescribed portfolio credit quality distribution as weights.
8. The term “expected spread” means a vector of spreads by weighted average life. This is calculated as a weighted average of the Table X spreads, using the prescribed portfolio credit quality distribution as weights.
9. The term “prescribed portfolio credit quality distribution” means the following credit rating distribution:
  - a. 5% Treasuries
  - b. 15% Aa bonds (5% Aa1, 5% Aa2, 5% Aa3)
  - c. 40% A bonds (13.33% A1, 13.33% A2, 13.33% A3)\*
  - d. 40% Baa bonds (13.33% Baa1, 13.33% Baa2, 13.33% Baa3)\*

\*40%/3 is used unrounded in the calculations.

#### C. Determination of the Statutory Maximum Valuation Interest Rate

##### 1. Valuation Rate Buckets

- a. For the purpose of determining the statutory maximum valuation interest rate, the contract, certificate or contract feature being valued must be assigned to one of four Valuation Rate Buckets labeled A through D.
- b. If the contract, certificate or contract feature has no life contingencies, the Valuation Rate Bucket is assigned based on the length of the reference period (RP), as follows:

**Table 3-1: Assignment to Valuation Rate Bucket by Reference Period Only**

<b>RP ≤ 5 Years</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
A	B	C	D

- c. If the contract, certificate or contract feature has life contingencies, the Valuation Rate Bucket is assigned based on the length of the RP and the initial age of the annuitant, as follows:

**Table 3-2: Assignment to Valuation Rate Bucket by Reference Period and Initial Age**

<b>Initial Age</b>	<b>RP ≤ 5Y</b>	<b>5Y &lt; RP ≤ 10Y</b>	<b>10Y &lt; RP ≤ 15Y</b>	<b>RP &gt; 15Y</b>
<b>90+</b>	A	B	C	D
<b>80–89</b>	B	B	C	D
<b>70–79</b>	C	C	C	D
<b>&lt; 70</b>	D	D	D	D

2. Premium Determination Dates

- a. The following table specifies the decision rules for setting the premium determination date for each of the contracts, certificates and contract features listed in Section 1:

**Table 3-3: Premium Determination Dates**

<b>Section</b>	<b>Item Description</b>	<b>Premium determination date</b>
A.2.a	Immediate annuity	Date consideration is determined and committed to by contract holder
A.2.b	Deferred income annuity	Date consideration is determined and committed to by contract holder
A.2.c	Structured settlements	Date consideration is determined and committed to by contract holder
A.2.d and A.2.e	Fixed payout annuities resulting from settlement options or annuitizations from host contracts	Date consideration for benefit is determined and committed to by contract holder
A.2.f	Supplementary contracts	Date of issue of supplementary contract
A.2.g	Fixed income payment streams from CDAs, AV becomes 0	Date on which AV becomes 0
A.2.h	Fixed income payment streams from guaranteed living benefits, AV becomes 0	Date on which AV becomes 0

A.2.i	Group annuity and related certificates	Date consideration is determined and committed to by contract holder
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**Guidance Note:** For the purposes of the items in the table above, the phrase “date consideration is determined and committed to by the contract holder” should be interpreted by the company in a manner that is consistent with its standard practices. For some products, that interpretation may be the issue date or the date the premium is paid.

b. Immaterial Change in Consideration

If the premium determination date is based on the consideration, and if the consideration changes by an immaterial amount (defined as a change in present value of less than 10% and less than \$1 million) subsequent to the original premium determination date, such as due to a data correction, then the original premium determination date shall be retained. In the case of a group annuity contract where a single premium is intended to cover multiple certificates, certificates added to the contract after the premium determination date that do not trigger the company’s right to reprice the contract shall be treated as if they were included in the contract as of the premium determination date.

3. Statutory Maximum Valuation Interest Rate

- a. For a given contract, certificate or contract feature, the statutory maximum valuation interest rate is determined based on its assigned Valuation Rate Bucket (Section 14.C.1) and its Premium Determination Date (Section 14.C.2) and whether the contract associated with it is a jumbo contract or a non-jumbo contract.
- b. Statutory maximum valuation interest rates for jumbo contracts are determined and published daily by the NAIC on the Industry tab of the NAIC website. For a given premium determination date, the statutory maximum valuation interest rate is the daily statutory maximum valuation interest rate published for that premium determination date.
- c. Statutory maximum valuation interest rates for non-jumbo contracts are determined and published quarterly by the NAIC on the Industry tab of the NAIC website by the third business day of the quarter. For a given premium determination date, the statutory maximum valuation interest rate is the quarterly statutory maximum valuation interest rate published for the quarter in which the premium determination date falls.

d. Quarterly Valuation Rate:

For each Valuation Rate Bucket, the quarterly valuation rate is defined as follows:

$$I_q = R + S - D - E$$

Where:

- a. R is the reference rate for that Valuation Rate Bucket (defined in Section 14.C.4);
- b. S is the spread rate for that Valuation Rate Bucket (defined in Section 14.C.5);
- c. D is the default cost rate for that Valuation Rate Bucket (defined in Section 14.C.6);

and

d. E is the spread deduction defined as 0.25%.

e. Daily Valuation Rate:

For each Valuation Rate Bucket, the daily valuation rate is defined as follows:

$$I_d = I_q + C_{d-1} - C_q$$

Where:

- a.  $I_q$  is the quarterly valuation rate for the calendar quarter preceding the business day immediately preceding the premium determination date;
- b.  $C_{d-1}$  is the daily corporate rate (defined in Section 14.C.7) for the business day immediately preceding the premium determination date; and
- c.  $C_q$  is the average daily corporate rate (defined in Section 14.C.8) corresponding to the same period used to develop  $I_q$ .

For jumbo contracts, the daily statutory maximum valuation interest rate is the daily valuation rate ( $I_d$ ) rounded to the nearest one-hundredth of one percent (1/100 of 1%).

#### 4. Reference Rate

Reference rates are updated quarterly as described below:

- a. The “quarterly Treasury rate” is the average of the daily Treasury rates for a given maturity over the calendar quarter prior to the premium determination date. The quarterly Treasury rate is downloaded from <https://fred.stlouisfed.org>, and is rounded to two decimal places.
- b. Download the quarterly Treasury rates for two-year, five-year, 10-year and 30-year U.S. Treasuries.
- c. The reference rate for each Valuation Rate Bucket is calculated as the weighted average of the quarterly Treasury rates using Table 1 weights (defined in Section 14.C.9) effective for the calendar year in which the premium determination date falls.

#### 5. Spread

The spreads for each Valuation Rate Bucket are updated quarterly as described below:

- a. Use the Table X spreads from the NAIC website for WALs two, five, 10 and 30 years only to calculate the expected spread.
- b. Calculate the spread for each Valuation Rate Bucket, which is a weighted average of the expected spreads for WALs two, five, 10 and 30 using Table 2 weights (defined in Section 3.I) effective for the calendar year in which the premium determination date falls.

#### 6. Default costs for each Valuation Rate Bucket are updated annually as described below:

- a. Use the VM-20 prescribed annual default cost table (Table A) in effect for the quarter prior to the premium determination date for WAL two, WAL five and WAL 10 years only to calculate the expected default cost. Table A is updated and published annually on

the Industry tab of the NAIC website during the second calendar quarter and is used for premium determination dates starting in the third calendar quarter.

- b. Calculate the default cost for each Valuation Rate Bucket, which is a weighted average of the expected default costs for WAL two, WAL five and WAL 10, using Table 3 weights (defined in Section 4314.C.9) effective for the calendar year in which the premium determination date falls.

7. Daily Corporate Rate

Daily corporate rates for each valuation rate bucket are updated daily as described below:

- a. Each day, download the Bank of America Merrill Lynch U.S. corporate effective yields as of the previous business day's close for each index series shown in the sample below from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from the table below\]](https://research.stlouisfed.org/fred2/series/[replace with series name from the table below]).

**Table 3-4: Index Series Names**

Maturity	Series Name
1Y – 3Y	BAMLC1A0C13YEY
3Y – 5Y	BAMLC2A0C35YEY
5Y – 7Y	BAMLC3A0C57YEY
7Y – 10Y	BAMLC4A0C710YEY
10Y – 15Y	BAMLC7A0C1015YEY
15Y+	BAMLC8A0C15PYEY

- b. Calculate the daily corporate rate for each valuation rate bucket, which is a weighted average of the Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 4314.C.9) effective for the calendar year in which the business date immediately preceding the premium determination date falls.

8. Average Daily Corporate Rate

Average daily corporate rates are updated quarterly as described below:

- a. Download the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields for each index series shown in Section 3.G.1 from the St. Louis Federal Reserve website: <https://research.stlouisfed.org/fred2/categories/32348>. To access a specific series, search the St. Louis Federal Reserve website for the series name by inputting the name into the search box in the upper right corner, or input the following web address: [https://research.stlouisfed.org/fred2/series/\[replace with series name from Section 4314.C.7.a\]](https://research.stlouisfed.org/fred2/series/[replace with series name from Section 4314.C.7.a]).

- b. Calculate the average daily corporate rate for each valuation rate bucket, which is a weighted average of the quarterly average Bank of America Merrill Lynch U.S. corporate effective yields, using Table 4 weights (defined in Section 14.C.9) for the same calendar year as the weight tables (i.e. Tables 1, 2, and 3) used in calculating  $I_q$  in Section 14.C.3.e.

9. Weight Tables 1 through 4

The system for calculating the statutory maximum valuation interest rates relies on a set of four tables of weights that are based on duration and asset/liability cash-flow matching analysis for representative annuities within each valuation rate bucket. A given set of weight tables is applicable to the calculations for every day of the calendar year.

In the fourth quarter of each calendar year, the weights used within each valuation rate bucket for determining the applicable valuation interest rates for the following calendar year will be updated using the process described below. In each of the four tables of weights, the weights in a given row (valuation rate bucket) must add to exactly 100%.

Weight Table 1

The process for determining Table 1 weights is described below:

- a. Each valuation rate bucket has a set of representative annuity forms. These annuity forms are as follows:
  - i. Bucket A:
    - a) Single Life Annuity age 91 with 0 and five-year certain periods.
    - b) Five-year certain only.
  - ii. Bucket B:
    - a) Single Life Annuity age 80 and 85 with 0, five-year and 10-year certain periods.
    - b) 10-year certain only.
  - iii. Bucket C:
    - a) Single Life Annuity age 70 with 0 and 15-year certain periods.
    - b) Single Life Annuity age 75 with 0, 10-year and 15-year certain periods.
    - c) 15-year certain only.
  - iv. Bucket D:
    - a) Single Life Annuity age 55, 60 and 65 with 0 and 15-year certain periods.
    - b) 25-year certain only.
- b. Annual cash flows are projected assuming annuity payments are made at the end of each year. These cash flows are averaged for each valuation rate bucket across the annuity forms for that bucket using the statutory valuation mortality table in effect for the following calendar year for

individual annuities for males (ANB).

- c. The average daily rates in the third quarter for the two-year, five-year, 10-year and 30-year U.S. Treasuries are downloaded from <https://fred.stlouisfed.org> as input to calculate the present values in Step d.
- d. The average cash flows are summed into four time period groups: years 1–3, years 4–7, years 8–15 and years 16–30. (**Note:** The present value of cash flows beyond year 30 are discounted to the end of year 30 and included in the years 16–30 group. This present value is based on the lower of 3% and the 30-year Treasury rate input in Step c.)
- e. The present value of each summed cash-flow group in Step d is then calculated by using the Step 3 U.S. Treasury rates for the midpoint of that group (and using the linearly interpolated U.S. Treasury rate when necessary).
- f. The duration-weighted present value of the cash flows is determined by multiplying the present value of the cash-flow groups by the midpoint of the time period for each applicable group.
- g. Weightings for each cash-flow time period group within a valuation rate bucket are calculated by dividing the duration weighted present value of the cash flow by the sum of the duration weighted present value of cash flow for each valuation rate bucket.

Weight Tables 2 through 4

Weight Tables 2 through 4 are determined using the following process:

- i. Table 2 is identical to Table 1.
  - ii. Table 3 is based on the same set of underlying weights as Table 1, but the 10-year and 30-year columns are combined since VM-20 default rates are only published for maturities of up to 10 years.
  - iii. Table 4 is derived from Table 1 as follows:
    - a) Column 1 of Table 4 is identical to column 1 of Table 1.
    - b) Column 2 of Table 4 is 50% of column 2 of Table 1.
    - c) Column 3 of Table 4 is identical to column 2 of Table 4.
    - d) Column 4 of Table 4 is 50% of column 3 of Table 1.
    - e) Column 5 of Table 4 is identical to column 4 of Table 4.
    - f) Column 6 of Table 4 is identical to column 4 of Table 1.
10. Group Annuity Contracts

For a group annuity purchased under a retirement or deferred compensation plan (Section ~~13~~14.A.2.i), the following apply:

- a. The statutory maximum valuation interest rate shall be determined separately for each certificate, considering its premium determination date, the certificate holder's initial age, the reference period corresponding to its form of payout and whether the contract is a jumbo contract or a non-jumbo contract.

**Guidance Note:** Under some group annuity contracts, certificates may be purchased on different

dates.

- b. In the case of a certificate whose form of payout has not been elected by the beneficiary at its premium determination date, the statutory maximum valuation interest rate shall be based on the reference period corresponding to the normal form of payout as defined in the contract or as is evidenced by the underlying pension plan documents or census file. If the normal form of payout cannot be determined, the maximum valuation interest rate shall be based on the reference period corresponding to the annuity form available to the certificate holder that produces the most conservative rate.

**Guidance Note:** The statutory maximum valuation interest rate will not change when the form of payout is elected.



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Valuation Manual Section II, Reserve Requirements

Subsection 2: Annuity Products

- A. This subsection establishes reserve requirements for all contracts classified as annuity contracts as defined in SSAP No. 50 in the AP&P Manual.
- B. Minimum reserve requirements for variable annuity (VA) contracts and similar business, specified in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, shall be those provided by VM-21. The minimum reserve requirements of VM-21 are considered PBR requirements for purposes of the *Valuation Manual*.
- C. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued prior to 1/1/2024 are those requirements as found in VM-A and VM-C as applicable, with the exception of the minimum requirements for the valuation interest rate for single premium immediate annuity contracts, and other similar contracts, issued after Dec. 31, 2017, including those fixed payout annuities emanating from host contracts issued on or after Jan. 1, 2017, and on or before Dec. 31, 2017. The maximum valuation interest rate requirements for those contracts and fixed payout annuities are defined in ~~Section 13.14~~ of VM-22, Statutory Maximum Valuation Interest Rates for Income Annuity Formulaic Reserves.
- D. Minimum reserve requirements for ~~non-variable~~ fixed annuity contracts issued on 1/1/2024 and later are those requirements as found in Sections 1 through ~~12~~ 13 of VM-22.

The requirements in this section are still considered a part of PBR requirements and therefore are applicable to VM-G.

The below principles may serve as key considerations for assessing whether VM 21 or VM 22 requirements apply:

- D. ~~Minimum reserve requirements apply:~~
- E. ~~Index for index-linked or modified guaranteed annuity contracts or riders that satisfy both of the following conditions may be a key consideration for application of VM 22 requirements; and are issued on 1/1/2024 and later are those requirements; as found in Sections 1 through 13 of VM-22.:~~
  - 1. Guarantees the principal amount of purchase payments, net of any partial withdrawals, and interest credited thereto, less any deduction (without regard to its timing) for sales, administrative or other expenses or charges.
  - 2. b. —Credits a rate of interest under the contract prior to the application of any market value adjustments that is at least equal to the minimum rate required to be credited by the standard nonforfeiture law in the jurisdiction in which the contract is issued.

~~Guidance Note: Paragraph E.1.b is intended to apply prior to the application of any market value adjustments for modified guaranteed annuities where the underlying assets are held in a separate account. If meeting Paragraph E.1.b prior to the application of any market value adjustments and Paragraph E.1.a above, it may be appropriate to value such contracts under VM-22 requirements.~~

Minimum reserve requirements:

**Commented [X677]:** We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

**Commented [VM22678R677]:** Waylon Peoples comment letter: Extend small company exemption in place for life PBR (VM-20) to VM-22.

**Commented [VM22679R677]:** The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

**Commented [CD680]:** "non-variable annuity"?

**Commented [VM22681R680]:** Edits to address this comment will be reflected in next exposure

**Commented [X682]:** "Section 13 of VM-22" may need to be updated if it is decided to have separate chapters for VM-22 VIR and VM-22 PBR.

**Commented [VM22683R682]:** Edits to address this comment will be reflected in next exposure

**Commented [CD684]:** "non-variable annuity"?

**Commented [VM22685R684]:** Edits to address this comment will be reflected in next exposure

**Commented [CD686]:** Consider adding the sentence: "The minimum reserve requirements of VM-22 are considered PBR requirements for purposes of the Valuation Manual." This is so VM-G will apply to VM-22, which would be appropriate.

**Commented [VM22687R686]:** Edits to address this comment will be reflected in next exposure

**Commented [X688]:** "Index-linked" annuity is not defined – only RILA and FIA in VM-22, recommend to revise the language or add a definition to define "index linked".

**Commented [X689]:** Recommend adding this part to E.1.b and delete the Guidance Note.

**Commented [VM22690R689]:** Edits to address this comment will be reflected in next exposure

for index

F. 2. ~~Index-linked or modified guaranteed annuity contracts or riders that do not satisfy either of the two conditions listed above~~ criteria in Paragraph Section 2.E.1 and Section 2.E.2 above and E.1.ii may be a key consideration for application of VM-21 ~~are issued on 1/1/2024 and later are those requirements as found in VM-21.~~

**Commented [X691]:** VM-21 specifically says “These requirements do not apply to contracts falling under the scope of VM-A-255: Modified Guaranteed Annuities; however, they do apply to contracts listed above that include one or more subaccounts containing features similar in nature to those contained in modified guaranteed annuities (MGAs) (e.g., market value adjustments).” Is this a contradiction?

**Commented [X692]:** Consistent with E above.

**Commented [VM22693R692]:** Edits to address this comment will be reflected in next exposure

Subsection 6: Riders and Supplemental Benefits

**Guidance Note:** Policies ~~Designs of policies~~ or contracts with riders and supplemental benefits which are created to simply disguise benefits subject to the Valuation Manual section describing the reserve methodology for the base product to which they are attached, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs with similar riders.

A. If a rider or supplemental benefit is attached to a health insurance product, deposit-type contract, or credit life or disability product, it may be valued with the base contract unless it is required to be separated by regulation or other requirements.

B. For supplemental benefits on life insurance policies or annuity contracts, including Guaranteed Insurability, Accidental Death or Disability Benefits, Convertibility, ~~Nursing Home Benefits~~ or Disability Waiver of Premium Benefits, the supplemental benefit may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, ~~VM-22~~, VM-A, and/or VM-C, as applicable.

~~C.~~ ULSG and other secondary guarantee riders on a life insurance policy shall be valued with the base policy and follow the reserve requirements for ULSG policies under VM-20, VM-A and/or VM-C, as applicable.

~~D.C.~~ ~~Any~~ guaranteed minimum benefits on life insurance policies or annuity contracts not subject to Paragraph C above including, but not limited to, Guaranteed Minimum Accumulation Benefits, Guaranteed Minimum Death Benefits, Guaranteed Minimum Income Benefits, Guaranteed Minimum Withdrawal Benefits, Guaranteed Lifetime Income Benefits, Guaranteed Lifetime Withdrawal Benefits, Guaranteed Payout Annuity Floors, Waiver of Surrender Charges, Return of Premium, Systematic Withdrawal Benefits under Required Minimum Distributions, and all similar guaranteed benefits shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

~~E.D.~~ If a rider or supplemental benefit to a life insurance policy or annuity contract that is not addressed in Paragraphs B, C, or D above possesses any of the following attributes, the rider or supplemental benefit shall be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, and VM-A and/or VM-C, as applicable.

1. The rider or supplemental benefit does not have a separately identified premium or charge.
2. After issuance, the rider or supplemental benefit premium, charge, value or benefits are determined by referencing the base policy or contract features or performance.
3. After issuance, the base policy or contract value or benefits are determined by referencing the rider or supplemental benefit features or performance. The deduction of rider or benefit premium or charge from the contract value is not sufficient for a determination by reference.

~~F.E.~~ If a term life insurance rider on the named insured[s] on the base life insurance policy does not meet the conditions of Paragraph E above, and either (1) guarantees level or near level premiums until a specified duration followed by a material premium increase; or (2) for a rider for which level or near level premiums are expected for a period followed by a material premium increase, the rider is

Commented [X694]: Still need the word "designs" otherwise this is saying the whole policy/contract was only created to disguise benefits, which would never be true.

Commented [VM22695R694]: Edits to address this comment will be reflected in next exposure

Commented [X696]: This reference is another place where there would be a benefit distinguishing the PBR sections of VM-22 from the non-PBR sections.

Commented [VM22697R696]: Edits to address this comment will be reflected in next exposure

Commented [X698]: These parallel requirements can be combined.

Commented [VM22699R698]: Edits to address this comment will be reflected in next exposure

separated from the base policy and follows the reserve requirements for term policies under VM20, VM-A and/or VM-C, as applicable.

~~G.F.~~ For all other riders or supplemental benefits on life insurance policies or annuity contracts not addressed in Paragraphs B through F above, the riders or supplemental benefits may be valued with the base policy or contract and follow the reserve requirements for the base policy or contract under VM-20, VM-21, VM-22, VM-A and/or VM-C, as applicable. For a given rider, the election to include riders or supplemental benefits with the base policy or contract shall be determined at the policy form level, not on a policy-by-policy basis, and shall be treated consistently from year-to-year, unless otherwise approved by the domiciliary commissioner.

~~H.G.~~ Any supplemental benefits and riders offered on life insurance policies or annuity contracts that would have a material impact on the reserve (for VM-20 and VM-22) or TAR (for VM-21) if elected later in the contract life, such as joint income benefits, nursing home benefits, or withdrawal provisions on annuity contracts, shall be considered when determining reserves (for VM-20 and VM-22) or reserves and TAR (for VM-21) using the following principles:

1. Policyholders with living benefits and annuitization in the same contract will generally use the more valuable of the two benefits.
2. ~~When advantageous, policyholders will commence living benefit payouts if not started yet.~~

**Commented [X700]:** Simplifications are judged relative to reserves for VM-20/VM-21 and TAR for VM-21.

**Commented [VM22701R700]:** Edits to address this comment will be reflected in next exposure

**Commented [X702]:** This section states that "When advantageous, policyholders will commence living benefit payouts if not started yet." This text seems to directly contradict VM-22 Section 6.H.2 which states "contract holder behavior should neither assume that all contract holders act with 100% efficiency in a financially rational manner nor assume that contract holders will always act irrationally". We suggest revising 6.H.2 to align with the text of 10.D.8.

VM-01: Definitions for Terms in Requirements

- The term “Guaranteed Minimum Accumulation Benefit” (GMAB) means a guaranteed benefit providing, or resulting in the provision, that an amount payable on the contractually determined maturity date of the benefit will be increased and/or will be at least a minimum amount. Only such guarantees having the potential to produce a contractual total amount payable on benefit maturity that exceeds the account value, or in the case of an annuity providing income payments, an amount payable on benefit maturity other than continuation of any guaranteed income payments, are included in this definition.
  
- The term “guaranteed minimum death benefit” (GMDB) means a provision (or provisions) for a guaranteed benefit payable on the death of a contract holder, annuitant, participant or insured where the amount payable is either (i) a minimum amount; or (ii) exceeds the minimum amount and is:
  - Increased by an amount that may be either specified by or computed from other policy or contract values; and
  - Contains either
    - The potential to produce a contractual total amount payable on such death that exceeds the account value, or
    - In the case of an annuity providing income payments, guarantees payment upon such death of an amount payable on death in addition to the continuation of any guaranteed income payments.
  
- The term “guaranteed minimum income benefit” (GMIB) means an option under which the contractholder has the right to apply a specified minimum amount that could be greater than the amount that would otherwise be available in the absence of such benefit to provide periodic income using a specified purchase basis.

**Commented [X703]:** We believe a Fixed Annuity PBR Exemption should be incorporated into draft in a manner consistent with the Life PBR Exemption.

**Commented [VM22704R703]:** The Subgroup voted in favor of a VM-22 PBR Exemption. The ACLI will follow-up with proposed criteria for determining the exemption.

**Page 6: [1] Commented [VM2248R47] VM-22 Subgroup 7/13/2022 4:11:00 PM**

Subgroup agrees with removing

**Page 6: [2] Commented [X49] TDI 11/9/2021 8:56:00 AM**

Proposed revision is not appropriate. Item (a) is unnecessary, and items under (b) would be addressed via simplifications and thus are indirectly reflected. Recommend deleting the whole section 1.C.3 including item (a) and item (b).

**Page 6: [3] Commented [VM2250R49] VM-22 Subgroup 7/13/2022 4:11:00 PM**

Subgroup agrees with removing this section.

**Page 6: [4] Commented [CD51] CA DOI 12/30/2021 3:10:00 PM**

should this same change also be made to VM-21?

**Page 6: [5] Commented [VM2252R51] VM-22 Subgroup 6/23/2022 9:01:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 6: [6] Commented [X53] TDI 11/9/2021 8:59:00 AM**

The revised language “sudden and significant levels of withdrawal and surrenders” replaces the original language “run on the bank” and is less clear. Does “significant” mean severe or extreme? Or just appreciably? Withdraws and surrenders certainly may vary by projected economic scenarios. Recommend using the original language “run on the bank” that had a clearer intent.

**Page 6: [7] Commented [VM2254R53] VM-22 Subgroup 7/13/2022 4:11:00 PM**

Subgroup in favor of retaining VM-21 language of “run on the bank”.

**Page 6: [8] Commented [X55] TDI 11/9/2021 9:02:00 AM**

We recommend deleting the wording “fundamentally”.

If a breakthrough is known to have fundamentally changed expected future mortality, but is not yet significantly reflected in historical experience, why is it not reflected? Do we know about this fundamental shift for years before it is reflected? This issue also applies to the VM-21 requirement.

**Page 6: [9] Commented [VM2256R55] VM-22 Subgroup 6/23/2022 9:02:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 6: [10] Commented [X57] ACLI**

We recommend removing the bullet “Significant future reserve increases as an unfavorable scenario is realized” as this is extraneous.

**Page 6: [11] Commented [VM2258R57] VM-22 Subgroup 7/13/2022 4:12:00 PM**

Subgroup in favor retaining language to stay consistent with VM-21.

**Page 6: [12] Commented [X59] ACLI**

List could be expanded to included operational risk and litigation risk.

**Page 6: [13] Commented [VM2260R59] VM-22 Subgroup 6/23/2022 9:03:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 7: [14] Commented [X65] TDI 11/9/2021 9:04:00 AM**

The term Buffer Annuity is not interchangeable to Registered Index-Linked Annuity (RILA) since Buffer Annuity is a subset of RILA. RILA can have different downside protections such as "Buffer" or "Floor". Recommend deleting Buffer Annuity or add descriptions for Buffer Annuity as a subtype in the RILA definition.

**Page 7: [15] Commented [X67] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 7: [16] Commented [X75] TDI 11/9/2021 9:07:00 AM**

The definition of FIA describes the account value as typically with guaranteed principal. Since FIA always has the guaranteed principal, recommend deleting the wording "typically".

**Page 9: [17] Commented [X97] ACLI**

Is "typically" intended to be a requirement in the definition? That is, to qualify as PRT must the insurance company have the asset risk? Consistent with the comment on Longevity Reinsurance, it would be helpful to clarify where a longevity swap contract falls within these definitions. Notably, index-based longevity swaps should be out of scope as they do not meet definition of "annuity contract" in SSAP 50. It should also be made explicit that PRT contracts can include lump sum benefits, death benefits and cash balance benefits as well.

**Page 9: [18] Commented [VM2298R97] VM-22 Subgroup 7/13/2022 4:13:00 PM**

Academy will review this comment as part of revisiting the longevity reinsurance definition.

**Page 9: [19] Commented [X99] ACLI**

It is unclear to us why RILA is defined in VM-22 when it is being used to exclude the product from VM-22 requirements.

**Page 9: [20] Commented [VM22100R99] VM-22 Subgroup 6/23/2022 9:12:00 AM**

ACLI already following up on a proposal to address the scope and definitions, which will address this issue.

**Page 9: [21] Commented [X103] ACLI**

Suggest aligning the cut off to 13 months for alignment consistent with Actuarial Guideline IX, rather than the 1 year that currently is in the VM-22 draft.

**Page 9: [22] Commented [X105] TDI 11/9/2021 9:06:00 AM**

The wording "after (or from)" the issue date used in the DIA and SPIA definitions is confusing. Recommend keeping it simple as "from" the issue date.

**Page 11: [23] Commented [VM22126R123] VM-22 Subgroup 6/23/2022 9:14:00 AM**

The VM-22 Subgroup voted to adopted "Option 1" for Reserving Categories



**Page 11: [24] Commented [VM22125R123] VM-22 Subgroup 3/2/2022 4:12:00 PM**

See Equitable comment letter: supports full aggregation, but if choosing between the two exposed options for two reserving categories, prefers option 2.

**Page 11: [25] Commented [VM22124R123] VM-22 Subgroup 3/2/2022 2:59:00 PM**

See NY comment letter: supports option 1, with additional category for "other" for any other contract with supporting assets such that there is greater reinvestment and longevity risks, than disintermediation risk and other risks associated with policyholder behavior as of the valuation date.

**Page 11: [26] Commented [X123] TDI 11/9/2021 9:23:00 AM**

The reserving categories for VM-22 are not included in Scope. Recommend including the defined reserving categories in the section when outlining Scope.

**Page 11: [27] Commented [X121] ACLI**

We would support reworking this section to rely on principles, rather than definitions to determine what is in and out of scope. As product innovation continues, a simple list may not appropriately accommodate the applicability of this chapter. However, if such a list is included, then we believe it should align with the full list presented in Section 13.

**Page 11: [28] Commented [VM22122R121] VM-22 Subgroup 6/23/2022 9:16:00 AM**

ACLI will follow up with a proposed revision to the definitions and scope section

**Page 11: [29] Commented [VM22128R127] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [30] Commented [CD127] CA DOI 12/30/2021 3:27:00 PM**

suggest numbering the paragraphs within this section

**Page 11: [31] Commented [CD129] CA DOI 12/30/2021 3:27:00 PM**

suggest swapping the order of this section. That is, start with the "in scope" list, rather than the "out of scope" list.

Also, it seems like there should be specific mentions of GMDBs and GLBs, as there are in VM-21, since those guarantees can also be found on FIAs.

**Page 11: [32] Commented [VM22130R129] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [33] Commented [X131] TDI 11/9/2021 9:12:00 AM**

Since buffer annuities are a subset of RILA, recommend deleting buffer annuities.

**Page 11: [34] Commented [VM22132R131] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [35] Commented [CD133] CA DOI 12/30/2021 3:28:00 PM**

this is not defined in the Definition section. should it be?

**Page 11: [36] Commented [VM22134R133] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [37] Commented [X135] TDI 11/9/2021 9:17:00 AM**

This needs to be revised to be in line with VM-21 Section 2.A. Consider removing "such as" list and adding a cross-reference to VM-21 Section 2.A.

**Page 11: [38] Commented [VM22136R135] VM-22 Subgroup 6/23/2022 9:16:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [39] Commented [CD137] CA DOI 12/30/2021 3:28:00 PM**

should this be "non-variable annuities" since that is term used in Section 1.A?

**Page 11: [40] Commented [VM22138R137] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [41] Commented [VM22142R141] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [42] Commented [VM22140R139] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [43] Commented [VM22144R143] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [44] Commented [VM22146R145] VM-22 Subgroup 6/23/2022 9:17:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [45] Commented [CD147] CA DOI 12/30/2021 3:31:00 PM**

should this be "Non-Variable Annuity"? Otherwise, should "Fixed Annuity" be defined in the Definitions section?

**Page 11: [46] Commented [VM22148R147] VM-22 Subgroup 6/23/2022 9:18:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 11: [47] Commented [CD149] CA DOI 12/30/2021 3:31:00 PM**

for consistency, make plural; i.e., change to "ies"

**Page 11: [48] Commented [VM22150R149] VM-22 Subgroup 6/23/2022 9:18:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 12: [49] Commented [X161] TDI 11/9/2021 9:33:00 AM**

Need to clarify what is meant by “VM-22 PBR Requirements”. Add specific section references, or update proposal to have the PBR and non-PBR sections of this VM-22 draft in different chapters. After having reviewed, we think it would be much more clear to reconsider the use of "VM-23" for the PBR requirements to avoid ambiguity around scope/exclusions. The non-PBR sections also just don't seem to fit in this draft, and there is now ambiguity around whether other parts of VM-22 apply to them (scope, effective date, principles, etc.).

**Page 12: [50] Commented [VM22162R161] VM-22 Subgroup 7/19/2022 4:41:00 PM**

Subgroup discussed moving current VM-22 requirements (currently Section 14) to “VM-V”. Will further discuss at the end of tier 3 comments.

**Page 12: [51] Commented [X165] TDI 11/9/2021 9:28:00 AM**

Can a company wait until the end of the transition period to start PBR, but then apply PBR to the issues from during the transition period? This was unclear for VM-20, and still seems unclear here. Need to be explicit one way or the other.

**Page 12: [52] Commented [VM22168R167] VM-22 Subgroup 6/23/2022 9:20:00 AM**

Discussed with Subgroup and decided to not have early adoption before the start of the three year transition period.

**Page 12: [53] Commented [CD167] CA DOI 12/30/2021 3:33:00 PM**

Will we (or should we) allow for any early adopters (like we did for VM-21)? It would seem reasonable to us to consider accommodating early adopters

**Page 12: [54] Commented [VM22166R165] VM-22 Subgroup 6/23/2022 9:19:00 AM**

Discussed with Subgroup and decided to keep the VM-22 language silent on this issue, similar to VM-20, leaving it to be determined on a case-by-case basis for each state.

**Page 15: [55] Commented [CD187] CA DOI 12/30/2021 3:35:00 PM**

suggest expanding header to "Stochastic Exclusion Test", for clarity

**Page 15: [56] Commented [VM22188R187] VM-22 Subgroup 7/19/2022 4:45:00 PM**

No objections from the Subgroup

**Page 15: [57] Commented [X189] ACLI**

Seems to imply that only SPIAs would pass due to the linkage to Section 13. But the reference to interest rates should be broader, if even necessary. Suggest editing as:

"these groups of contracts may be valued using the methodology and statutory maximum valuation rate pursuant to applicable requirements in VM-A, and VM-C, and with the statutory maximum valuation rate for immediate annuities specified in Section 13."

**Page 15: [58] Commented [VM22190R189] VM-22 Subgroup 6/23/2022 11:26:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [59] Commented [CD191] CA DOI 12/30/2021 3:36:00 PM**

Suggest rewording to just say "the stochastic exclusion test". There is only 1 SET, with 3 ways of passing it. Therefore, the current wording is confusion because it suggests that there are multiple SETs.

**Page 15: [60] Commented [VM22192R191] VM-22 Subgroup 6/23/2022 9:23:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [61] Commented [X193] ACLI**

We believe this guidance note is unnecessary as the intent of the section is clear, and the wording is possibly confusing.

**Page 15: [62] Commented [VM22194R193] VM-22 Subgroup 7/19/2022 4:46:00 PM**

No objections to removing this guidance note.

**Page 15: [63] Commented [X195] TDI 11/9/2021 9:57:00 AM**

The statement in this section is not acceptable as discussed in the previous TX comment letter. This will have the effect of potentially masking blocks that need PBR.

**Page 15: [64] Commented [VM22196R195] VM-22 Subgroup 6/23/2022 9:26:00 AM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure

**Page 15: [65] Commented [X197] ACLI**

This section seems to indicate that the grouping of contracts in exclusion testing should be the same as the grouping of contracts for aggregation. This might cause fewer product types to be qualifying for exclusion if the test must be performed at a higher level of aggregation.

**Page 15: [66] Commented [VM22198R197] VM-22 Subgroup 6/23/2022 9:27:00 AM**

Subgroup voted to use wording consistent with VM-20, which prohibits aggregating contracts with significantly different risk profiles.

**Page 15: [67] Commented [CD199] CA DOI 12/30/2021 3:42:00 PM**

for clarity, change this reference to "Section 3.D"

**Page 15: [68] Commented [VM22200R199] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [69] Commented [CD201] CA DOI 12/30/2021 3:41:00 PM**

again, suggest rewording this to just say "the stochastic exclusion test"

**Page 15: [70] Commented [VM22202R201] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [71] Commented [VM22204R203] VM-22 Subgroup 7/16/2022 9:55:00 PM**

Subgroup agreed that wording for exclusion test aggregation should be consistent with VM-20. Edits to address this comment will be reflected in next exposure.

**Page 15: [72] Commented [X205] ACLI**

Either in this item or in Section 12 allocation to contracts not covered by PBR methodology in VM-22 needs to be addressed e.g., carve out because reserves calculated on seriatim formulaic basis.

**Page 15: [73] Commented [VM22206R205] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 15: [74] Commented [X207] ACLI**

This sub-section seems more appropriate in Section 4 (or pulled out completely and consolidated within "I. Introduction" or "VM-01" and applied to all PBR methods).

**Page 15: [75] Commented [VM22208R207] VM-22 Subgroup 7/16/2022 9:57:00 PM**

The Subgroup decided to focus solely on VM-22 for now and hold off exploring on common principles and assumptions sections

**Page 15: [76] Commented [CD209] CA DOI 12/30/2021 3:43:00 PM**

VM-21 Section 3.H on simplifications, approximations, and modeling efficiency techniques is missing (including the Guidance Note). Would it make sense to add it?

**Page 15: [77] Commented [VM22210R209] VM-22 Subgroup 7/19/2022 4:49:00 PM**

Subgroup decided to add this section.

**Page 15: [78] Commented [VM22212R211] VM-22 Subgroup 6/23/2022 9:24:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 18: [79] Commented [X237] TDI 11/9/2021 10:38:00 AM**

If due premium as of the projected start date is included in the modeling, the final reported reserve should be adjusted by adding the due premium, otherwise there would be a double counting of the due premium asset. This needs to be clarified - see guidance note added below.

Recommend specifying the revenue in this bullet to be gross premium since there are other revenue items that are discussed in other bullets.

**Page 18: [80] Commented [X241] ACLI**

The purpose of this guidance note is not clear as these charges would be reflected in the cash flows.

**Page 18: [81] Commented [X245] TDI 11/9/2021 10:42:00 AM**

Changed investment expense to be maintenance expense so that it does not repeat what is included in bullet h.

**Page 18: [82] Commented [X249] TDI 11/9/2021 10:41:00 AM**

Take out the revenues that covers the investment expenses and added a separate bullet under bullet "a" for other revenues.

**Page 18: [83] Commented [CD251] CA DOI 12/30/2021 3:53:00 PM**

Both net and gross cash flows have to be considered, so I don't agree with the addition of "Net" here

**Page 34: [84] Commented [VM22384] VM-22 Subgroup 7/5/2022 4:21:00 PM**

New language drafted by select Subgroup Members to provide certain conditions under which SPIA contracts could automatically pass the exclusion test

**Page 34: [85] Commented [CD385] CA DOI 12/30/2021 4:11:00 PM**

Suggest renaming this section header/name to "Requirements to Pass the SET". There is only 1 SET, but 3 ways to pass it (SERT, Demonstration or Certifications). The language gets confusing (here and elsewhere) when you start saying there are different "types" of SETs.

**Page 35: [86] Commented [X389] ACLI**

We recommend removing "pension risk transfer business" from products scoped out of SET certification method. It is unclear why this business would be treated differently from individually issued business for testing intended to capture interest rate risk.

**Page 35: [87] Commented [VM22390R389] VM-22 Subgroup 3/2/2022 2:51:00 PM**

Subgroup voted to keep PRT ineligible for the Certification Method

**Page 35: [88] Commented [CD391] CA DOI 12/30/2021 4:12:00 PM**

See earlier comments about the use of "future"

**Page 35: [89] Commented [VM22396R395] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [90] Commented [VM22394R393] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [91] Commented [CD397] CA DOI 12/30/2021 4:14:00 PM**

what is meant by "aggregate risk levels"? Aggregated across what? Need clarification on the intentions for adding this phrase, when it is not in VM-20. Otherwise, I would suggest deleting this.

**Page 35: [92] Commented [VM22398R397] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [93] Commented [X399] TDI 11/18/2021 9:49:00 PM**

This is not in VM-20 and would substantially change the exclusion. The intent is not to allow you to group a block that has material interest rate risk with a larger block that is insensitive to interest rate risks and thereby pass. If "aggregate" referred to potential compounding of interest rate, longevity, or asset risk then this could be redrafted to clearly call out a 4th category of risk due to a combination of the first three. However, I think this is already implicitly covered.

**Page 35: [94] Commented [VM22400R399] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [95] Commented [VM22402R401] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [96] Commented [CD403] CA DOI 12/30/2021 4:15:00 PM**

note, there is no insertion of "aggregate risk levels across" here, like there was above. (to be clear, i don't support adding it.)

**Page 35: [97] Commented [VM22404R403] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [98] Commented [CD405] CA DOI 12/30/2021 4:16:00 PM**

This wording is a little clunky here. My suggestion:

"A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A and VM-C are at least as great..."

**Page 35: [99] Commented [VM22406R405] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [100] Commented [VM22408R407] VM-22 Subgroup 6/23/2022 10:11:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [101] Commented [X407] TDI 9/7/2021 9:28:00 AM**

Replace all "contracts" with "contracts and certificates"

**Page 35: [102] Commented [VM22411R410] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [103] Commented [VM22413R412] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [104] Commented [VM22415R414] VM-22 Subgroup 6/23/2022 1:36:00 PM**

Edits to address this comment will be reflected in next exposure

**Page 35: [105] Commented [X416] TDI 11/18/2021 10:37:00 PM**

Need to add a review of the company's mortality and/or longevity risk.

**Page 35: [106] Commented [VM22417R416] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 35: [107] Commented [X418] ACLI**

As written, the SERT assumes a single premium product given the change of the denominator to the scenario reserve. Alternative product designs (such as longevity swap) could result in unintended

results. We recommend maintaining consistency with VM-20 and using a denominator of future benefits (annuity payments, DBs, etc., excluding premium considerations, expenses, etc.).

**Page 35: [108] Commented [VM22419R418] VM-22 Subgroup 6/23/2022 10:12:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 35: [109] Commented [X420] TDI 11/18/2021 9:53:00 PM**

Using (a) in the denominator instead of VM-20's (c) which is a PV of benefits could make this ratio unstable when the scenario reserve (a) is very small. This is particularly applicable if the block being tested does not have CSV.

**Page 35: [110] Commented [VM22421R420] VM-22 Subgroup 6/23/2022 10:13:00 AM**

Consensus to use a denominator that only includes benefits and expenses, consistent with VM-20

**Page 35: [111] Commented [X422] TDI 11/18/2021 9:59:00 PM**

The variability should be assured to be immaterial based on the company's materiality standard.

**Page 36: [112] Commented [VM22444R443] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [113] Commented [CD443] CA DOI 12/30/2021 4:18:00 PM**

better to keep the reference to the full Section (i.e., Section 7.C.1)

**Page 36: [114] Commented [VM22442R441] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [115] Commented [VM22446R445] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [116] Commented [CD445] CA DOI 12/30/2021 4:20:00 PM**

why delete this? seems like it wouldn't hurt to keep this language, for additional clarity

**Page 36: [117] Commented [X447] TDI 11/18/2021 10:09:00 PM**

Be consistent with standard VM references

**Page 36: [118] Commented [VM22448R447] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure

**Page 36: [119] Commented [CD449] CA DOI 12/30/2021 4:20:00 PM**

better to reference the full Section (i.e., Section 7.C.1.b)

**Page 36: [120] Commented [VM22450R449] VM-22 Subgroup 6/23/2022 10:15:00 AM**

Edits to address this comment will be reflected in next exposure





Nov. 18, 2022

## **Exposure for AG49-A Quick Fix Proposal**

On October 13, 2022, the IUL Illustration Subgroup exposed “quick fix” proposals to address the issue of some companies illustrating non-benchmark indices in a more favorable manner than benchmark indices. These proposals are found in the “Exposure Drafts” tab of the [IUL Illustration Subgroup webpage](#).

Following up on the straw poll conducted during the November 9 Subgroup call, as explained on the November 17, 2022 Life Actuarial Task Force (LATF) call, it is possible a vote for adoption of the Securian proposal will occur at the NAIC National Meeting LATF session in December.

A potential final version of the Securian proposal is provided below.

Of note, the changes from the version of the proposal exposed at the Subgroup are:

- Elimination of the second background paragraph of AG 49-A, due to the lack of significance and relevance combined with the redundancy with the Effective Date section of the Guideline.
- Establishment of March 25, 2023 as the effective date of the revisions. That date is the potential NAIC executive / plenary adoption date. If the date of adoption is later than March 25, 2023, the effective date could be changed at the committee or executive level.

**Please send comments to Scott O’Neal ([soneal@naic.org](mailto:soneal@naic.org)) by close of business Nov. 30.**

### **Actuarial Guideline XLIX-A**

#### **THE APPLICATION OF THE LIFE ILLUSTRATIONS MODEL REGULATION TO POLICIES WITH INDEX-BASED INTEREST SOLD (On or After December 14, 2020)**

##### **Background**

The *Life Insurance Illustrations Model Regulation* (#582) was adopted by the NAIC in 1995. Since that time there has been continued evolution in product design, including the introduction of benefits that are tied to an index or indices. Although these policies are subject to Model #582, not all of their features are explicitly referenced in the model, resulting in a lack of uniform practice in its implementation. In the absence of uniform guidance, two illustrations that use the same index and crediting method often illustrated different credited rates. The lack of uniformity can be confusing to potential buyers and can cause uncertainty among illustration actuaries when certifying compliance with Model #582.

~~In 2019, the NAIC decided that illustrations of products with multipliers, cap buy ups, and other enhancements that are linked to an index or indices should not illustrate better than products without such features. This new requirement is intended to apply to illustrations on policies sold on or after the effective date of this guideline while the existing requirements continue to apply for inforce illustrations on policies sold before the effective date of this guideline.~~

This guideline provides uniform guidance for policies with index-based interest. In particular, this guideline:

- (1) Provides guidance in determining the maximum crediting rate for the illustrated scale and the earned interest rate for the disciplined current scale.

AG49A-1

AG XLIX-A

Appendix C

- (2) Limits the policy loan leverage shown in an illustration.
- (3) Requires additional consumer information (side-by-side illustration and additional disclosures) that will aid in consumer understanding.

**Text**

1. Effective Date

This Actuarial Guideline shall be effective for all new business and in force illustrations on policies sold on or after December 14, 2020.

2. Scope

This Actuarial Guideline shall apply to any life insurance illustration that meets both (i) and (ii), below:

- i. The policy is subject to Model #582.
- ii. The policy offers Indexed Credits.

3. Definitions

A. Alternate Scale: A scale of non-guaranteed elements currently being illustrated such that:

- i. The Annual Rate of Indexed Credits for each Index Account does not exceed the lesser of the maximum Annual Rate of Indexed Credits for the illustrated scale less 100 basis points and the credited rate for the Fixed Account. If the insurer does not offer a Fixed Account with the illustrated policy, the Annual Rate of Indexed Credits for each Index Account shall not exceed the average of the maximum Annual Rate of Indexed Credits for the illustrated scale and the guaranteed Annual Rate of Indexed Credits for that account. However, the Annual Rate of Indexed Credits for each Index Account shall never be less than the guaranteed Annual Rate of Indexed Credits for that account.
- ii. If the illustration includes a loan, the illustrated Policy Loan Interest Credited Rate shall not exceed the illustrated Policy Loan Interest Rate. For example, if the illustrated Policy Loan Interest Rate is 4%, the Policy Loan Interest Credited Rate shall not exceed 4%.
- iii. All other non-guaranteed elements are equal to the non-guaranteed elements for the illustrated scale.

B. Annual Net Investment Earnings Rate: Gross portfolio annual earnings rate of the general account assets (excluding hedge assets for Indexed Credits), less provisions for investment expenses and default cost, allocated to support the policy. Charges of any kind cannot be used to increase the Annual Net Investment Earnings Rate.

C. Annual Rate of Indexed Credits: The total annualized Indexed Credits expressed as a percentage of the account value used to determine the Indexed Credits.

D. Benchmark Index Account: An Index Account with the following features:

- i. The interest calculation is based on the percent change in S&P 500<sup>®</sup> Index value only, over a one-year period using only the beginning and ending index values.

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(S&P 500® Index ticker: SPX)

- ii. An annual cap is used in the interest calculation.
  - iii. The annual floor used in the interest calculation shall be 0%.
  - iv. The participation rate used in the interest calculation shall be 100%.
  - v. Interest is credited once per year.
  - vi. The Hedge Budget used to determine the cap in 3 (D) (ii) does not exceed the Annual Net Investment Earnings Rate. Charges of any kind cannot be used to increase the annual cap.
  - vii. There are no enhancements or similar features that provide additional Indexed Credits in excess of the interest provided by 3 (D) (i) through 3 (D) (v), including but not limited to experience refunds, multipliers, or bonuses.
  - viii. There are no limitations on the portion of account value allocated to the account.
  - ix. A single Benchmark Index Account will be determined for each policy. This can be either an Index Account offered with the illustrated policy or determined according to Section 4 (A) (ii) for purposes of complying with this guideline. A policy shall have no more than one Benchmark Index Account.
- E. Fixed Account: An account where there are no Indexed Credits.
- F. Hedge Budget: For each Index Account, the total annualized amount assumed to be used to generate the Indexed Credits of the account, expressed as a percent of the account value in the Index Account. This total annualized amount should be consistent with the hedging program of the company.
- G. Index Account: An account where some or all of the amounts credited are Indexed Credits.
- H. Indexed Credits: Any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to policy values that is linked to an index or indices. Amounts credited to the policy resulting from a floor greater than zero on an account with any interest credit, multiplier, factor, bonus, charge reduction, or other enhancement to policy values that is linked to an index or indices are included.
- I. Loan Balance: Any outstanding policy loan and loan interest, as defined in the policy.
- J. Policy Loan Interest Rate: The current annual interest rate as defined in the policy that is charged on any Loan Balance. This does not include any other policy charges.
- K. Policy Loan Interest Credited Rate: The annualized interest rate credited that applies to the portion of the account value backing the Loan Balance:
- i. For the portion of the account value in the Fixed Account that is backing the Loan Balance, the Policy Loan Interest Credited Rate is the applicable annual interest crediting rate.
  - ii. For the portion of the account value in an Index Account that is backing the Loan Balance, the Policy Loan Interest Credited Rate is the Annual Rate of Indexed

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Credits, net of any applicable Supplemental Hedge Budget, for that account.

- L. Supplemental Hedge Budget: For each Index Account, the Hedge Budget minus the minimum of the Annual Net Investment Earnings Rate and the Hedge Budget that is used in the determination of the Benchmark Index Account. The Supplemental Hedge Budget will never be less than zero. This amount should be consistent with the hedging program of the company.

4. Illustrated Scale

The total Annual Rate of Indexed Credits for the illustrated scale for each Index Account shall be limited as follows:

- A. Calculate the geometric average annual credited rate for the Benchmark Index Account for the 25-year period starting on 12/31 of the calendar year that is 66 years prior to the current calendar year (e.g., 12/31/1949 for 2015 illustrations) and for each 25-year period starting on each subsequent trading day thereafter, ending with the 25- year period that ends on 12/31 of the prior calendaryear.
  - i. If the insurer offers a Benchmark Index Account with the illustrated policy, the illustration actuary shall use the current annual cap for the Benchmark Index Account in 4 (A).
  - ii. If the insurer does not offer a Benchmark Index Account with the illustrated policy, the illustration actuary shall use actuarial judgment to determine a hypothetical, supportable current annual cap for a hypothetical, supportable Index Account that meets the definition of the Benchmark Index Account, and shall use that cap in 4 (A).
- B. For the Benchmark Index Account the Annual Rate of Indexed Credits shall not exceed the minimum of (i) and (ii):
  - i. The arithmetic mean of the geometric average annual credited rates calculated in 4 (A).
  - ii. 145% of the Annual Net Investment Earnings Rate.
- C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i) and (ii) for policies issued prior to March 25, 2023 and shall not exceed the minimum of (i), (ii), and (iii) for policies sold on or after March 25, 2023:
  - i. The Annual Rate of Indexed Credits for the Benchmark Index Account calculated in 4 (B) plus the Supplemental Hedge Budget for the Index Account.
  - ii. The Annual Rate of Indexed Credits reflecting the fundamental characteristics of the Index Account and the appropriate relationship to the expected risk and return of the Benchmark Index Account. The illustration actuary shall use actuarial judgment to determine this value using lookback methodology consistent with 4 (A) and 4 (B) (i) where appropriate.
  - iii. The lesser of (1) and (2) multiplied by the Annual Rate of Index Credits for the Benchmark Index Account, calculated in 4 (B), divided by (2); plus, the

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Supplemental Hedge Budget:

1. The Hedge Budget of the Indexed Account
2. Hedge Budget of the Benchmark Indexed Account.

- D. For the purposes of compliance with Section 6 (C) of Model #582, the Supplemental Hedge Budget is subtracted from the Annual Rate of Indexed Credits before comparing to the earned interest rate underlying the disciplined current scale.

At the beginning of each calendar year, the insurer shall be allowed up to three (3) months to update the credited rate for each Index Account in accordance with 4 (B) and 4 (C).

5. Disciplined Current Scale

The earned interest rate for the disciplined current scale shall be limited as follows:

- A. If an insurer engages in a hedging program for Indexed Credits in an account, the assumed earned interest rate underlying the disciplined current scale for that account, inclusive of all general account assets, both hedge and non-hedge assets, that support the policy, net of default costs and investment expenses (including the amount spent to generate the Indexed Credits of the policy) shall not exceed the lesser of (i) and (ii):
- i. The Annual Net Investment Earnings Rate, plus 45% of the lesser of (1) and (2):
    1. Hedge Budget minus any annual floor, to the extent that the floor is supported by the Hedge Budget.
    2. The minimum of the Annual Net Investment Earnings Rate and the Hedge Budget that is used in the determination of the Benchmark Index Account.
  - ii. The Annual Rate of Indexed Credits plus the Annual Net Investment Earnings Rate minus the Hedge Budget.

These rates should be adjusted for timing differences in the hedge cash flows to ensure that fixed interest is not earned on the Hedge Budget minus any annual floor, to the extent that the floor is supported by the Hedge Budget.

Guidance Note: The above approach does not stipulate any required methodology as long as it produces a consistent limit on the assumed earned interest rate underlying the disciplined current scale.

For a policy with multiple Index Accounts, a maximum rate in 5 (A) should be calculated for each account. All accounts, fixed and indexed, within a policy can be tested in aggregate.

- B. If an insurer does not engage in a hedging program for Indexed Credits, the assumed earned interest rate underlying the disciplined current scale shall not exceed the Annual Net Investment Earnings Rate.
- C. These experience limitations shall be included when testing for self-support and lapse-support under Model #582, accounting for all illustrated benefits including any illustrated benefits and bonuses that impact the policy's account value.

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6. Policy Loans

If the illustration includes a loan, the illustrated Policy Loan Interest Credited Rate shall not exceed the illustrated

Policy Loan Interest Rate by more than 50 basis points. For example, if the illustrated Policy Loan Interest Rate is 4.00%, the Policy Loan Interest Credited Rate shall not exceed 4.50%.

7. Additional Standards

The basic illustration shall also include the following:

- A. A ledger using the Alternate Scale shall be shown alongside the ledger using the illustrated scale with equal prominence.
- B. A table showing the minimum and maximum of the geometric average annual credited rates calculated in 4 (A).
- C. For each Index Account illustrated, a table showing actual historical index changes and corresponding hypothetical Indexed Credits using current index parameters for the most recent 20-year period.



**Brian Bayerle**  
Senior Actuary

**Colin Masterson**  
Policy Analyst

November 30, 2022

Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup

Re: Securian AG49-A Quick Fix Proposal

Dear Ms. Hemphill and Mr. Andersen:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit feedback on the exposed Securian AG49-A Quick Fix proposal to address the issue of some companies illustrating non-benchmark indices in a more favorable manner than benchmark indices under the current regulatory framework.

As noted in our previous letter, ACLI would be supportive of either the Securian approach or Group of 7 Companies approach to amending AG49-A. After reviewing the LATF-exposure of the Securian approach, we have two comments to be considered by regulators before adoption.

First, in Section 4.C, the language around the effective date should be consistent with prior prospective-only AG49 changes. The language should be consistently “policies sold.”

Second, our members have expressed concern around the feasibility of the March 25<sup>th</sup> effective date. Companies will require adequate time to adjust and update their illustration systems, marketing materials, administration systems that produce in force illustrations, and agent training. Having additional implementation time after final approval would be appreciated so an effective date of May 1<sup>st</sup> would be preferred by ACLI.

With these edits combined, we would suggest the following changes to Section 4.C:

C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i) and (ii) for policies sold ~~issued~~ prior to May 1, 2023 ~~March 25, 2023~~

American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

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and shall not exceed the minimum of (i), (ii), and (iii) for policies sold on or after May 1, 2023

~~March 25, 2023:~~

Thank you once again for allowing us to submit feedback on this proposal. We are grateful for the work done by regulators on this issue thus far and we are looking forward to the discussion at the NAIC Fall National Meeting.

Best,

cc: Scott O'Neal, NAIC

October 13, 2022

**Indexed Universal Life (IUL) Illustration (A) Subgroup**  
**Exposure for Model Reg 582 Ideas**

To address concerns relating to IUL illustrations, the IUL Illustration (A) Subgroup has been charged to provide recommendations for consideration of changes to the *Life Insurance Illustrations Model Regulation (#582)*.

By Tuesday, November 22, 2022, please provide comments for the following:

- Which Model Reg 582 subsections to consider opening
  - Provide an opinion on aspects of proposed Model Regulation revision concepts that are actuarial in nature and aspects that may be non-actuarial.
- Concepts for draft revisions to address broad IUL illustration issues
- Whether such addressing of broad issues could occur without revising the Model Regulation

**Please send comments to Jennifer Frasier ([jfrasier@naic.org](mailto:jfrasier@naic.org)) by close of business Nov. 22.**



**Brian Bayerle**  
Senior Actuary

**Colin Masterson**  
Policy Analyst

November 18, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup

Re: Model Reg 582 Ideas

Dear Ms. Hemphill and Mr. Andersen:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the exposure soliciting feedback on the IUL Illustration (A) Subgroup's (Subgroup) consideration of changes to *Life Insurance Illustrations Model Regulation #582 (Model)*.

ACLI wishes to work with LATF and the Subgroup to develop solutions to appropriately address the regulatory concerns around IUL illustrations and to foster appropriate consumer understanding of these products. However, it is not a simple task to determine which subsections of the Model to consider opening without a clear understanding on what concern(s) the changes are trying to solve.

To help develop solutions, ACLI believes the Subgroup should more clearly outline the concern(s) they are trying to address and let that drive the development of potential revisions to the Model. As part of that process, ACLI suggests laying out a set of guiding regulatory principles to help drive more targeted feedback. Below, we suggest some possibilities:

Ensure illustrations:

- demonstrate both the benefits and risks of product features to promote consumer understanding;
- are product-neutral, so that any changes to the Model create a level playing field between products;
- are adaptable to new product development to ensure that consumers are provided innovative products that adapt to current market environments.

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The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

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ACLI hopes that with a greater understanding of regulator concerns, we would be better situated to provide feedback towards solutions to those concerns.

Thank you for your consideration and we look forward to future discussions.

Handwritten signature of B. Banerji in cursive script.

*Colin Masterson*

cc: Scott O'Neal, NAIC

November 22, 2022

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup (Subgroup)

Via Email: [jfrasier@naic.org](mailto:jfrasier@naic.org)

**Indexed Universal Life (IUL) Illustration (A) Subgroup**  
**Exposure for Model Reg 582 Ideas**

Dear Mr. Andersen:

The Coalition of Concerned Insurance Professionals appreciates the opportunity to comment on this Exposure Draft for Model Reg 582 revisions.

The Subgroup is seeking comments to the following:

- Which Model Reg 582 subsections to consider opening
  - Provide an opinion on aspects of proposed Model Regulation revision concepts that are actuarial in nature and aspects that may be non-actuarial.
- Concepts for draft revisions to address broad IUL illustration issues
- Whether such addressing of broad issues could occur without revising the Model Regulation

We will first address the specific comments requested by the Subgroup addressing Index UL and then provide a broader and historical perspective on Model Reg 582.

## Index UL and Targeted Revisions to Model Reg 582

We believe that any attempt to open Model reg 582 to include Index UL must first address AG49-A concerns. Accordingly, we recommend the combination of Phase 1 – The Securian Proposal (with an effective date of March 2023) and Phase 2 – The Coalition Proposal (with an effective date of January 2024) AG49-A amendments in the plan to reopen Model 582. These two phases are transitional prerequisites that are assumed to have been implemented by 1/1/2024 and will facilitate a more orderly addition of indexed methodologies into Model Reg 582 and allow any Reg 582 working group to commence following this year's NAIC winter meeting.

Prior to addressing targeted revisions to Model Reg 582, the AG49-A as amended, will have established for index UL illustrations the following:

- i. Removal of the lookback methodology described in Section 4(A) of AG 49-A that uses historical index return data combined with declared elements to produce a maximum illustrated rate
- ii. Installation of the Hedge Budget in Section 4(C) as the maximum illustrated rate for any indexed account.
- iii. Disclosure of the Hedge Budget in Section 7 for each Indexed Account as the basis for the illustrated rate
- iv. Reduction of the 45% factor in Section 5(A)(i) to 0% and clarification of actuarial supportability testing to align with changes made to Section 4.  
This will bring non-BIA accounts into alignment with the BIA account, and also create consistency in illustrations between Indexed UL and other fixed life insurance products.

In no way does the elimination of the lookback from Section 4(A) reduce the ability for the consumer to understand the mechanics of indexed crediting or the product. The ability to demonstrate the variability and hypothetical historical returns of indexed crediting is already available in the illustration through the tables described in AG 49-A Section 7(C). We believe these tables should remain and could be enhanced by Model Reg 582 amendments adopting a standardized stochastic analysis of volatility for life insurance products and require illustrations to show consumers the probability of the illustrated assumptions to sustain to policy maturity.

Appropriate sales of Index UL can continue while modifications to #582 are explored to holistically incorporate indexed crediting.

The examination of targeted sections of #582 to address Index UL are as follows:

- Section 4(D) of 582 states that “‘Disciplined current scale’ means a scale of non-guaranteed elements constituting a limit on illustrations currently being illustrated by an insurer that is reasonably based on actual recent historical experience.”
- ASOP 24 clarifies that the investment return factor of the disciplined current scale “should be reasonably based on recent actual investment experience, net of default costs, of the assets supporting the policy block.” In the case of Indexed UL, the assets supporting the policy block are a diversified portfolio of fixed income assets with demonstrable recent experience as would be found in any other fixed life insurance product.
- However, ASOP 24 goes further, stating that “if interest credits are linked to an external index or indices, then the investment return factor is sensitive to business or economic cycles...When

determining the investment return factor for policies within the scope of AG 49, actuaries should comply with limitations imposed on the assumed earned interest rate underlying the disciplined current scale.”

- In our view, this standard of practice goes beyond the scope of #582 by addressing the return on assets – specifically options – that are used to hedge a particular product feature rather than assets that are used to support the policy block. Furthermore, it delegates the limitation on the disciplined current scale to AG 49/AG 49-A, which determines the earned interest rate for the disciplined current scale in Section 5, essentially using the Annual Rate of Indexed Credits as determined by the hypothetical historical lookback methodology in Section 4 to determine the limit. In other words, the tail wags the dog.
- In order for the lookback methodology to be comprehensively and cohesively written into #582, the model must be adjusted to delineate between assets that support a block of business, assets used to hedge particular features in the business and other assets that may contribute to returns in a policy indirectly, as in participating Whole Life. From there, it must determine appropriate frameworks for determining assumed investment returns for each category, including potentially using a hypothetical historical lookback methodology as is currently found in AG 49-A. This will undoubtedly be a long, arduous and complex process because of the far-reaching nature of the question.
- By contrast, the Coalition Proposal is consistent with #582 as written because it references *only* the assets used to support the policy block. It assumes that hedge assets are not in scope and



does not require the life insurer to determine a separate investment return for those assets.

## Broad Historical Perspective of Model Reg 582

### Model Reg 582 Objectives in 1995

1. Differentiate guarantees from nonguaranteed elements
2. Demonstrate how the product works

The industry succeeded with #1 and failed with #2 as a result of the combination of product innovations by insurers (generally a good thing) and the Model's scope limitations (variable excluded and future products such as NLG UL and IUL were unanticipated and ultimately incompatible with the Model). The time has come to resolve this.

The shift away from guarantees by many carriers - to indeterminate premium universal life policies introduced in the late 1970s - has enormously complicated the selling *and* buying process. Because universal life policies do not have specified premiums, and the required funding cost to sustain the policy until death would not be known for a number of years of fluctuating crediting rates (and policy expenses in a number of instances), producers (and their clients) have had no choice but to interpret "how the policy works" and "what the policy will cost" from computer-generated policy illustrations. Yet, as the Society of Actuaries commented in 1991:

*"How credible are any non-guaranteed numbers projected 20 years into the future, even if constructed with integrity? How does a consumer ... [or agent!] ... evaluate the credibility of two illustrations if they are from different companies - or even from the same company - if different products with different guarantees are being considered?"*

*Most illustration problems arise because illustrations create the illusion that the insurance company knows what will happen in the future, and that knowledge has been used to create the illustration.”*

Competitive practices led to the unintended and inappropriate use of illustrations as *projections* of nonguaranteed outlays, values and distribution, and spawned more than 40 years of “who has the best price” via comparative positioning. The illustration-based recommendations of a “best-price” product invariably rely on the most attractive current, nonguaranteed crediting and expense projections and/or the appearance of lowest premiums.

A 2016 academic paper by Professors Daniel Gottlieb and Kent Smetters determined that “...nearly 88% of universal life policies ultimately do not terminate with a death benefit claim.” This quote was footnoted to state “While term policies have a larger *annual* lapse rate, permanent policies are usually more likely to lapse over the actual life of the policy due to their longer duration.” The paper was updated in 2021 with similar statistical findings.

Under such circumstances of lapse, all anticipated income tax benefits of life insurance not only disappear, but if there has been a deferred gain in the policy, ordinary income taxes will be due by the policy owner in the year of lapse.

### Broader Recommendations Concerning #582

While Index UL illustrations have been the focus of attention in recent years, the abusive use of nonguaranteed projections is not limited to Index UL. To continue to allow for innovations in product design that can benefit consumers, fulfillment of the objectives from 1995 requires:

1. Expansion to include all illustratable life insurance products, and
2. Replacement of constant assumed crediting rate projections with a principles-based regulation that allows for nonlinear representations of the NAIC's second purpose of the Model: To facilitate the consumer's understanding how the subject policy works.

We believe these objectives cannot be implemented without revising Model Reg 582 more broadly. Accordingly, we propose the following:

1. Establish a target for an NAIC vote on model amendments no later than December 31, 2025.
2. Establish a working group made up of five representatives appointed by the NAIC with representation from the industry, the profession and consumer groups with the charge to develop a principles-based model regulation amendment to 582. The model amendments should replace the constant rate illustration projection in favor of some dynamic methodology that can be standardized for consistent adoption by all manufacturers and distributors. The working group's objective should be the same as in 1995 but to eliminate the prevailing practice to using nonguaranteed illustrations as projections, used primarily and deceptively as a competitive comparison tool.
3. Establish that this working group collaborates with a FINRA working group to harmonize 582 as amended to include registered and variable life insurance products for illustrations. This working group should also address the glaring issue in IUL policies – that while clarified as general account products and therefore not requiring securities licensing – agents not holding a securities license are asked for (and often provide) investment advice as to the selection of complex index options.

Concepts in the scope of an amended 582 regulation which could be addressed by a working group should include:

- Fixed premium versus indeterminate premium use
- Products classified as securities (i.e., Variable UL and WL)
- Fixed Index (zero floor methodologies) (AG49 as amended)
- Structured index methodologies (negative floor or buffered)
- Recast Regulation definitions and treatment of nonguaranteed versus guaranteed elements with the explicit inclusion of products such as WL, NLG UL, NLG VUL, Hybrid fixed or variable, and Term.
- No Lapse Guarantee (AG37, AG38 as amended)
- Hybrid products (where the death benefit is accelerated or enhanced by riders, policy endorsements, etc. for LTC, Chronic, Critical or Terminal Illness)
- Self-supporting and non-lapse supported sections of the model are expanded to invalidate use in nonguaranteed illustrations of charge funded crediting or COI offsetting.

Signed,

The Coalition of Concerned Insurance Professionals

November 22, 2022

Mr. Fred Andersen  
Chair, Indexed Universal Life (IUL) Illustration (A) Subgroup

Via Email: [jfrasier@naic.org](mailto:jfrasier@naic.org)

Re: October 13 IUL Subgroup Exposure for Model Reg 582 Ideas

Dear Mr. Andersen:

The undersigned companies welcome the opportunity to comment on the exposure regarding Life Insurance Illustrations Model Regulation #582 (Model). We would like to acknowledge the efforts the IUL Illustration Subgroup and Life Actuarial Task Force (LATF) have put forth to date and appreciate the opportunity to participate in the process.

As regulators consider exploring a comprehensive, longer-term solution, we believe that the desired end state and specific regulatory goals for life insurance illustrations should be established before determining what changes, if any, are needed to the Model. We agree with the comments made by the American Council of Life Insurers (ACLI) in response to this exposure and recommend that any review of the illustration framework include the following principles:

- Focus on protecting consumers by enhancing their understanding of all life insurance products.
- Promotion of consumer access and a regulatory framework that fosters a fair and competitive playing field across all types of life insurance as consumers may be considering multiple product types.
- Accommodation of evolving product designs in response to consumer interest while mitigating the possibility of frequent updates to the Model or Actuarial Guideline.

We propose that these principles serve as a starting point for defining the best way to educate consumers on all life insurance products. As regulators look toward a potential comprehensive review, we recommend consideration of how all life insurance products illustrate not only Indexed Universal Life. With clearly defined goals, we will be in a better position to provide constructive input to support LATF and the IUL Illustration Subgroup in determining if this end state requires opening the Model, or if it can be achieved through an Actuarial Guideline or other means.

Building on the principles outlined above, we propose the following ideas be considered as a part of any effort to improve consumer understanding in the next phase:

- Expanded or updated disclosures to increase transparency and better explain product features for all products.
- Inclusion of varying returns in Indexed Universal Life illustrations and how it impacts the illustrated values and exploration of how this concept could enhance other types of life insurance illustrations.
- Strengthening consumer understanding of the guaranteed, average, and alternative ledgers.

Our companies make every effort to ensure customers choose the products and features that meet their needs. We are committed to supporting the efforts of regulators to enhance disclosures and illustrations. Thank you for your consideration and we look forward to future discussions.

Allianz Life  
John Hancock  
Lincoln National  
National Life Group  
Nationwide  
Pacific Life  
Sammons Financial Companies



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AMERICAN ACADEMY of ACTUARIES  
*Objective. Independent. Effective.™*

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November 22, 2022

Mr. Fred Andersen  
Chair, Indexed Universal Life (IUL) Illustration (A) Subgroup (“IUL Subgroup”)  
National Association of Insurance Commissioners

Re: IUL Subgroup Exposure for Model Reg 582 Ideas (October 13, 2022)

Dear Mr. Andersen,

The American Academy of Actuaries<sup>1</sup> Life Illustrations Work Group (the “work group”) is providing the below comments to the IUL Subgroup on the Exposure for Model Regulation #582 (“the Model”) Ideas from October 13, 2022.

In response to the IUL Subgroup’s request for comment, our work group reviewed the Model to identify sections that may need to be modified—to enact, allow for, or align with proposed IUL illustration changes. When contemplating changes to IUL illustrations, our work group has focused on satisfying the Type A Usage of illustrations,<sup>2</sup> which is intended to show the consumer the mechanics of the policy being purchased and how policy values or premium payments change over time.

As the work group performed this review, we determined that more clarity is needed as to how the IUL Subgroup thinks certain IUL features should be illustrated before we can respond to the questions in the exposure. To that end, the work group suggests that a public discussion of the following questions, and direction from the IUL Subgroup on these issues, would be helpful before determining which subsections, if any, of the Model to open:

1. How should index-based credits be illustrated?
  - Should illustrated values based on a non-level pattern of index-based credited rates be shown?
  - Should illustrated values based on more than one pattern or level of rates be shown?
  - Should illustrated values based on historical index performance be shown?

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

<sup>2</sup> As defined in the SOA Task Force Research on Life Insurance Sales Illustrations as published in the *Transactions of the Society of Actuaries 1991–92 Reports*. The report concluded that Type B Usage, which is intended to project likely or best estimates of future performance and compare cost or performance of different policies, was inherently unworkable.

2. How should the maximum illustrated rate be determined?
  - Should historical index performance be used?
  - Should all index accounts have the same maximum illustrated rate?
    - If so, should that maximum be based on the S&P 500 index with an annual point-to-point crediting strategy (i.e., the current Benchmark Index Account (BIA))?
  - Should a predetermined maximum illustrated rate similar to variable universal life (VUL) be used?
3. What is the desired balance between reflecting the current environment vs. long-term averages in illustrations (for example, in illustrated index parameters)?
4. Should the implied risk premium associated with the hedge budget be limited?
5. How should the risks and rewards of index-based credits be illustrated?
6. How can illustrations be designed to promote consumer understanding of the product features (e.g., multipliers, buy ups, participation rates, fixed bonuses, indexed loans)?
7. How can illustrations be designed to deemphasize the maximum illustrated rate while still demonstrating how product features operate?
8. How should any product with a tie to an index (for example, a dividend formula with interest credits related to an index) be addressed?

Note that several of these questions and concepts apply beyond just IUL illustrations. For example, many non-IUL products contain features such as fixed bonuses and leveraged loans that are currently illustrated.

Some types of illustration changes may be fully implemented through an actuarial guideline (i.e., without opening the Model), while others may require revision of multiple subsections in the Model. For example, if more than one level of credited rates is required for the illustrated scale, the work group has identified several subsections of the Model that may need to be considered for potential revision.

The work group appreciates the efforts of the IUL Subgroup to review Actuarial Guideline 49-A and Model Regulation #582. If you have any questions or would like to discuss the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Brian R. Lessing, MAAA, FSA  
Chairperson, Life Illustrations Work Group  
American Academy of Actuaries





November 22, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC life Actuarial Task Force

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup (Subgroup)

via email to [jfrasier@naic.org](mailto:jfrasier@naic.org)

Re.: Model Reg 582 Ideas

Dear Ms. Hemphill and Mr. Andersen:

The Transamerica Companies (“Transamerica”) appreciate the opportunity to provide comments on the *Exposure for Model Reg 582 Ideas*. First, we would like to voice support for the ACLI letter. Second, presuming the model is opened, we would like to suggest a minor change that would be helpful for not only Indexed Universal Life policy owners, but owners of other life products as well.

Currently, in most states, insurance companies are prohibited from providing customers in force illustrations at then-current credited rates and charges under commonly occurring circumstances; the information in these illustrations is something that customers want and that companies want to provide.

The problem is that companies are not allowed to provide any illustration, including an in force illustration, that fails either the lapse-support test or the self-support test according to the model regulation. Many in force products, e.g., Universal Life, fail at least one of these tests at current credited rates and charges. Transamerica often receives requests for in force illustrations for such policies and customers are disappointed when informed that we cannot provide one. This prohibition also seems to run counter to Section 10.C of the Illustration Model Reg which states that “upon the request of the policy owner, an insurer shall furnish an in force illustration of the current and future benefits and values based on the insurer’s present illustrated scale.”

Below is a minor wording change to Section 10.C which would eliminate the requirement for in force illustrations to pass the self-support and lapse-support tests (recommended change in **bold**):

NAIC Model 582 Section 10.C

Upon the request of the policy owner, the insurer shall furnish an in force illustration of the current and future benefits and values based on the insurer’s present illustrated scale. This illustration shall comply with the requirements of Section 6A, 6B **(except 6.B(9) and 6.B(10))**, 7A, and 7E. No signature or other acknowledgement of receipt of this illustration shall be required.

Thank you for your consideration.

Sincerely, Andrew DeMarco, Head of Life Solutions, Transamerica

*Andrew DeMarco*

11/20/22

Indexed Universal Life (IUL) Illustration (A) Subgroup  
Virtual Meeting  
November 9, 2022

The Indexed Universal Life (IUL) Illustration (A) Subgroup met Nov. 9, 2022. The following Subgroup members participated: Fred Andersen, Chair (MN); Ted Chang (CA); Manny Hidalgo (CT); Mike Yanacheak (IA); Vincent Tsang (IL); Derek Wallman (NE); Bill Carmello (NY); Peter Weber (OH); Maribel Castillo, Darlene Plyler, and Heike Ulrich (TX); and Tomasz Serbinowski (UT).

1. Heard Comments Regarding a Quick Fix to AG 49-A

Andersen reminded the Subgroup that on Oct. 6, the Life Actuarial (A) Task Force provided the Subgroup with two charges. The first charge is to attempt a quick fix to *Actuarial Guideline XLIX-A—The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest to Policies Sold on or After December 14, 2020* (AG 49-A) regarding the issue of uncapped volatility-controlled indices being illustrated, in some cases, more favorably than capped Standard & Poor's 500 (S&P 500) benchmark indices. The second charge is to explore a potential request to the Life Insurance and Annuities (A) Committee to look into a limited, targeted opening of the *Life Insurance Illustrations Model Regulation* (#582) to reduce the probability of the Task Force and the Subgroup needing to do further guideline updates to address anticipated future product designs.

Andersen reminded the Subgroup that during its Oct. 12 meeting, it exposed two documents to address the two charges. For the exposure relating to the charge regarding Model #582, the comment period ends Nov. 22.

Andersen said that this meeting will address the charge for a quick fix to get illustrations of uncapped volatility-controlled indices in line with illustrations of capped S&P 500 benchmark indices.

Andersen noted that the public was invited to make comments on three proposals: 1) a proposal from Securian Financial; 2) a proposal from a group of multiple companies; and 3) a proposal from a coalition of insurance professionals. The proposers were also invited to further explain their proposals, including providing comparisons of metrics for benchmark and non-benchmark indices under the various proposals. The Subgroup received five comment letters.

The Subgroup heard summaries of comment letters from the American Academy of Actuaries' (Academy's) Life Illustrations Work Group; Securian Financial and Penn Mutual; Allianz, John Hancock, Lincoln National, National Life, Nationwide, Pacific Life, and Sammons (group of 7); a coalition of 12 concerned insurance professionals (coalition); and the American Council of Life Insurers (ACLI). Follow-up questions and comments were also heard.

Subgroup members discussed the proposals, comment letters, and views for a direction going forward. Some were in favor of changing the current practice of using past performance in the look back period to determine the long-term projection rate for an IUL illustration. Others were in favor of pursuing a small change now and considering a broader change later. Andersen noted that in the Subgroup's exposure regarding ideas for Model #582, there is flexibility to address broad IUL illustration issues without revising the model regulation, and some ideas presented in the quick-fix proposals could be pursued later for a long-term solution. Other concepts discussed included a disclosure of the company's hedge budget and potential maximum limits used in the illustration calculation.

Andersen reiterated the Subgroup's charge of developing a quick fix to address the illustration discrepancy between uncapped volatility-controlled indices and capped S&P 500 benchmark indices. He noted his opinion that for this phase of the project, the Task Force did not contemplate receiving Subgroup recommendations for changing the limits on the benchmark index aspects in IUL illustrations. He characterized the two charges as first applying the brakes on a specific current practice and then considering approaches to address a broader view. Andersen also explained the timing and steps for final adoption of a quick-fix proposal and potential impacts for progressing to a long-term proposal if a quick fix was not recommended soon.

The Subgroup heard from interested parties who expressed concerns about a quick fix and suggested that the Subgroup address the broader concerns sooner rather than later. As part of his comments, Birny Birnbaum (Center for Economic Justice—CEJ) expressed support for the coalition proposal.

Subgroup members discussed the pros and cons of pursuing a quick fix and the potential breadth of a quick fix.

The Subgroup held a straw poll for whether to pursue a quick fix and a potential direction for a quick fix. Six Subgroup members (plus the Subgroup chair) favored pursuing the Securian approach as the quick fix. Four Subgroup members favored a more conservative approach resembling the coalition proposal. No members favored the group of 7 approach. Andersen said that he plans to continue this discussion, including presenting the straw poll results, as part of the Subgroup's update to the Task Force at the Fall National Meeting.

Having no further business, the Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/A CMTE/LATF/2022 Fall/IULI Calls/11 09/Nov 9 Minutes.docx

11/13/22

Indexed Universal Life (IUL) Illustration (A) Subgroup  
Virtual Meeting  
October 12, 2022

The Indexed Universal Life (IUL) Illustration (A) Subgroup met Oct. 12, 2022. The following Subgroup members participated: Fred Andersen, Chair (MN); Ted Chang (CA); Manny Hidalgo (CT); Mike Yanacheak (IA); Derek Wallman (NE); Bill Carmello (NY); Peter Weber (OH); Maribel Castillo, Darlene Plyler, and Heike Ulrich (TX); and Tomasz Serbinowski (UT).

1. Exposed a Request to Collect Comments Regarding Model Regulation #582

Mr. Andersen noted that on Oct. 6, the Life Actuarial (A) Task Force provided the Subgroup with two charges. The first charge is to attempt a quick fix to *Actuarial Guideline XLIX-A—The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest to Policies Sold on or After December 14, 2020* (AG 49-A) regarding the issue of uncapped volatility controlled indices being illustrated, in some cases, more favorably than capped Standard & Poor's 500 (S&P 500) benchmark indices. The second charge is to explore a potential request to the Life Insurance and Annuities (A) Committee to look into a limited, targeted opening of the *Life Insurance Illustrations Model Regulation* (#582) to reduce the probability of the Task Force and the Subgroup needing to do further guideline updates to address anticipated future product designs.

Mr. Andersen started discussion with the second charge, which could involve opening a public comment period to collect initial ideas on what subsections of Model #582 to potentially open and to collect concepts of the types of changes that would be needed to prevent additions or updates to the actuarial guidelines relating to IUL illustrations.

Mr. Andersen noted potential considerations for comments. He mentioned that one consideration is that the broader the scope of opening Model #582, the longer it will likely take to get through the process of adopting revisions. Another consideration is that there are likely aspects of Model #582 that lead to oversimplification of IUL illustrations, but potential remedies may lead to overcomplication of the illustrations. Brainstorming will be needed to lead to the right balance.

Mr. Andersen said that if comments are collected, it would be helpful if revision suggestions for Model #582 could perhaps identify concepts that could likely be addressed in a shorter time frame, along with concepts that may take longer to address. He asked commenters to keep in mind other parties that might have an interest in aspects of potential changes to Model #582. He also mentioned that ideas to address the broader issues without opening Model #582 would be welcome. He said that it would be helpful to receive comments on aspects that are actuarial in nature, as well as aspects that may be non-actuarial, as this may help the Committee potentially delegate work assignments.

Mr. Andersen anticipated that the next conversation on what a recommendation to the Committee will look like will occur at the Task Force's session at the Fall National Meeting.

Mr. Weber made a motion, seconded by Mr. Hidalgo, to open a public comment period through Nov. 22 to collect comments regarding potential direction of activity (Attachment Thirty-Nine-A). After discussion, the motion passed.

2. Exposed a Request to Collect Comments Regarding a Quick Fix to AG 49-A

Mr. Andersen repeated that the charge from the Life Actuarial (A) Task Force is to address the issue of uncapped volatility controlled indices being illustrated more favorably by some companies than capped S&P 500 benchmark indices. The quick fix would be to address the issue of uncapped volatility controlled indices so they illustrate no more favorably than currently required for capped S&P 500 benchmark indices. Proposals beyond that may be addressed in work associated with the charge discussed earlier in the meeting.

Mr. Andersen noted that from a previous exposure and comment period, multiple proposals and comment letters regarding a quick fix are temporarily available on the Subgroup's web page.

The Subgroup heard a proposal from Securian Financial, presented by Brian Rock (Securian Financial).

The Subgroup heard a proposal from a group of six companies (Allianz, John Hancock, Lincoln National, National Life, Pacific Life, and Sammons), presented by Austin Bichler (Allianz).

The Subgroup heard a proposal from Bobby Samuelson (The Life Product Review) and Sheryl Moore (Moore Market Intelligence). Mr. Samuelson noted that other comment letters provided comments in the same direction.

Mr. Andersen said that the other comment letters received from the previous exposure were not specific in terms of wording proposals. He asked for commenters to present any other specific proposals. No response was given.

The Subgroup heard discussion on the proposals presented.

Mr. Andersen invited those who presented proposals to submit a letter using more plain language to explain the methodology and results. This would help the Subgroup and others to understand how each proposal works, and to help them assess the pros and cons of each proposal. Mr. Serbinowski added that numerical examples and calculations would also be helpful.

Mr. Yanacheak said that he would like to hear feedback on the idea that different indices could be limited to illustrate the same. Mr. Serbinowski clarified this request by asking whether products and strategies associated with the same hedge budget should illustrate the same.

Mr. Yanacheak made a motion, seconded by Mr. Serbinowski, to expose the proposals contained in the comment letters from Securian Financial and the group of six companies, a proposal that clarifies the Samuelson-Moore comment letter, and the discussion topic of whether products and strategies associated with the same hedge budget should illustrate the same (Attachment Thirty-Nine-B) for a 21-day public comment period ending Nov. 3. The motion passed.

Having no further business, the Indexed Universal Life (IUL) Illustration (A) Subgroup adjourned.

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October 13, 2022

## **Indexed Universal Life (IUL) Illustration (A) Subgroup**

### **Exposure for Model Reg 582 Ideas**

To address concerns relating to IUL illustrations, the IUL Illustration (A) Subgroup has been charged to provide recommendations for consideration of changes to the *Life Insurance Illustrations Model Regulation (#582)*.

By Tuesday, November 22, 2022, please provide comments for the following:

- Which Model Reg 582 subsections to consider opening
  - Provide an opinion on aspects of proposed Model Regulation revision concepts that are actuarial in nature and aspects that may be non-actuarial.
- Concepts for draft revisions to address broad IUL illustration issues
- Whether such addressing of broad issues could occur without revising the Model Regulation

**Please send comments to Jennifer Frasier ([jfrasier@naic.org](mailto:jfrasier@naic.org)) by close of business Nov. 22.**

October 13, 2022

## **Indexed Universal Life (IUL) Illustration (A) Subgroup**

### **Exposure for AG49-A Quick Fix Proposals**

By Thursday, November 3, 2022, please provide comments for the items below (also found in the “Exposure Drafts” tab of the [IUL Illustration Subgroup webpage](#)).

1. Proposal contained in the Sept. 6 comment letter from [Securian Financial](#)
2. Proposal contained in the Sept. 6 comment letter from the [Group of 6 companies \(Allianz, et al.\)](#)
3. Proposal letter from the [Coalition of Concerned Insurance Professionals](#), clarifying the [Samuelson-Moore](#) comment letter submitted around Sept. 6
4. [Discussion topic](#) proposed during the October 12 Subgroup Call

In your comments, please address the pros and cons of each item.

Note: The authors of items 1-3 have been asked to provide an additional explanation of their proposal that uses more plain language and numerical examples of, for instance, the resulting credited rates and related values associated with benchmark and non-benchmark indices before and after the proposed revisions. Once provided, these explanations will be posted on the “Exposure Drafts” tab of the [IUL Illustration Subgroup webpage](#).

**Please send comments to Jennifer Frasier ([jfrasier@naic.org](mailto:jfrasier@naic.org)) by close of business Nov. 3.**



September 6, 2022  
Mr. Fred Andersen  
Chair, NAIC Indexed Universal Life (IUL) Illustration (A) Subgroup (IUL Subgroup)

Dear Fred,  
Securian Financial respectfully submits these comments in response to the NAIC IUL Illustrations (A) Subcommittee request for comments on AG49-A.

Securian Financial believes that a quick fix for the currently identified issue is obtainable. There are several straightforward ways to change AG49-A to make it clearer/better enforce that the BIA guardrails apply to all illustrated indexes.

We understand that there is an ask to consider opening, all or part of Model #582. We believe we need to better understand what LATF is hoping to accomplish by opening the model regulation before we can fully comment. The model regulation applies to several types of products thus adding IUL specific language to the regulation could have unintended consequences that need to be thoroughly thought-out and vetted. If LATF determines that they want to move forward with defining the scope for changes to model #582, Securian Financial is ready to participate with our industry peers in defining that scope.

We resubmit the language below to be added to AG49-A for consideration as a “quick fix”.

### **Recommended Changes**

We would like to recommend changes to AG49-A 4C by adding condition (iii) to limit the maximum amount of leverage illustrated to that of the BIA:

C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i), (ii) and (iii):

- i. The Annual Rate of Indexed Credits for the Benchmark Index Account calculated in 4 (B) plus the Supplemental Hedge Budget for the Index Account.
- ii. The Annual Rate of Indexed Credits reflecting the fundamental characteristics of the Index Account and the appropriate relationship to the expected risk and return of the Benchmark Index Account. The illustration actuary shall use actuarial judgment to determine this value using lookback methodology consistent with 4 (A) and 4 (B) (i) where appropriate.
- iii. The lesser of (a) and (b) multiplied by the Annual Rate of Index Credits for the Benchmark Index Account, calculated in 4B, divided by (b); plus, the supplemental hedge budget:
  - a) The Hedge Budget of the Indexed Account
  - b) Hedge Budget of the Benchmark Indexed Account.

Respectfully,  
Seth Detert, Securian Financial

Securian Financial is the marketing name for Securian Financial Group, Inc. and its affiliates. Insurance products are issued by its affiliated insurance companies. Securities and investment advisory services offered through Securian Financial Services, Inc., registered investment advisor, member FINRA/SIPC.



September 6, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Mr. Fred Andersen  
Chair, Index Universal Life (IUL) Illustration (A) Subgroup (Subgroup)

Via Email: soneal@naic.org

Re: IUL Re-Exposure

Dear Ms. Hemphill and Mr. Andersen:

The undersigned companies welcome the opportunity to comment on the Life Actuarial Task Force re-exposure of options regarding illustrations for indexed universal life insurance (IUL) policies.<sup>1</sup> We would like to acknowledge the efforts the IUL Illustration Subgroup and Life Actuarial Task Force have put forth to address illustrations of IUL products over the past several years, including the current effort regarding the Actuarial Guideline 49-A framework. We appreciate the opportunity to provide our comments on the questions and potential solutions that are under consideration.

Illustrations are meant to protect consumers and foster understanding of life insurance products and features. With this important purpose in mind, we offer recommendations for an interim fix impacting IUL illustrations and a long-term solution for life illustrations. As a first step in determining the scope and approach of a long-term solution to address illustrations, we recommend a thorough analysis be completed to identify the regulatory goals and the ideal end state. Such an analysis should follow a holistic and principles-based approach with a focus on consumer understanding of various product features. This analysis would inform whether changes to the Life Insurance Illustrations Model Regulation #582 (Model) are needed and the scope of necessary revisions. We believe that any changes to the Model should be focused on protecting consumers and accommodating evolving product designs in response to market interest while mitigating the possibility of frequent updates to the Model. Throughout the analysis, we would ask that regulators appropriately factor the importance of promoting consumer access and a regulatory framework that fosters a fair and competitive playing field across all types of life insurance, and unique features of indexed universal life, as consumers may be considering multiple product types.

In the interim, we recommend implementing a “quick fix” with a brief revision to Actuarial Guideline 49-A consistent with “Option A” in the American Academy of Actuaries’s February 2022 comment letter.<sup>2</sup> We support a limit on indexed illustrated rates of 145% of each indexed account’s hedge budget, similar to the 145% of net investment earned rate limitation on the Benchmark Index Account. A limited

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<sup>1</sup> The undersigned companies represent approximately 50% of the IUL insurance sales in 2021 based on premium

<sup>2</sup> American Academy of Actuaries, Comments on IUL Exposure from the December 8, 2021 LATF Session, (February 3, 2022)

revision, to be applied on a prospective basis, to section 4C of AG49A would accomplish this change as specified in the appendix. While this approach could still result in some index accounts illustrating slightly higher than the Benchmark Index Account, it would quickly lower the illustrated values of volatility controlled indices and allow regulators and interested parties to begin a thorough analysis to determine the scope, approach, and implementation of a long-term solution.

Thank you for the consideration of these comments. We would be glad to respond to any questions you may have regarding this letter.

Allianz  
John Hancock  
Lincoln National  
National Life Group  
Pacific Life  
Sammons Financial Companies

#### **Appendix – Revised AG49A Language**

4. C. For any other Index Account that is not the Benchmark Index Account in 3 (D), the Annual Rate of Indexed Credits illustrated as a percentage of the account value in the Index Account prior to the deduction of any charges used to fund a Supplemental Hedge Budget shall not exceed the minimum of (i), (ii) and (iii):

i. The Annual Rate of Indexed Credits for the Benchmark Index Account calculated in 4 (B) plus the Supplemental Hedge Budget for the Index Account.

ii. The Annual Rate of Indexed Credits reflecting the fundamental characteristics of the Index Account and the appropriate relationship to the expected risk and return of the Benchmark Index Account. The illustration actuary shall use actuarial judgment to determine this value using lookback methodology consistent with 4 (A) and 4 (B) (i) where appropriate.

iii. 145% of the Hedge Budget for the Index Account.

Fred,

Thank you for the opportunity to submit a proposal to the IUL Illustration Subgroup to address the issue of certain non-BIA account options, typically using volatility-controlled indices, that illustrate total credits greater than the Benchmark Index Account. That result is inconsistent with the intent of AG 49-A.

We understand that the charge from LATF to the Subgroup is to suggest simple and straightforward modifications to AG 49-A that would equalize the maximum illustrated performance of BIA and non-BIA accounts. This proposal meets the criteria of the charge.

Our proposal is to:

1. Remove the lookback methodology described in Section 4(A) of AG 49-A that uses historical index return data combined with declared elements to produce a maximum illustrated rate
2. Install the Hedge Budget in Section 4(C) as the maximum illustrated rate for any indexed account. The Hedge Budget is already a defined term in AG 49-A.
3. Reduce the 45% factor in Section 5(A)(i) to 0%

This proposal will not only bring non-BIA accounts into alignment with the BIA account, but it also creates consistency in illustrations between Indexed UL and other fixed life insurance products while modifications to #582 are explored to holistically incorporate indexed crediting.

The ability to demonstrate the variability and hypothetical historical returns of indexed crediting is still available in the illustration courtesy of the tables described in AG 49-A Section 7(C). We firmly believe these tables should remain. In no way does the elimination of the lookback from Section 4(A) reduce the ability for the consumer to understand the mechanics of indexed crediting or the product.

Signed,  
The Coalition of Concerned Insurance Professionals

Fred,

We appreciate the opportunity to present solutions to the current identified issue with Indexed Universal Life illustrations. In light of the discussion at the recent NAIC meeting and the prospect of a regulatory inquiry into a modification of the Illustration Model Regulation (#582) specifically to address consumer-friendly ways to illustrate Indexed UL, it seems to us that the Subgroup has two potential paths for a solution to the current issue:

### **Path 1 – Maintain the Lookback**

Maintaining the lookback would allow Indexed UL to continue to illustrate in a way that is **inconsistent** with other fixed insurance products while the broader of issue of modifications to #582 is undertaken by regulators, a process that may take several years.

A solution that maintains the lookback methodology would define and extend the illustrated “option profit” in the BIA account to the non-BIA accounts, as has been proposed by other parties. In our view, pursuing this path could potentially require substantial revisions to AG 49-A in order to ensure that it is airtight.

### **Path 2 – Remove the Lookback**

Removing the lookback would make Indexed UL illustrate in a way that is **consistent** with other fixed insurance products while broader changes to #582 are explored. There are at least three solutions that do not incorporate the lookback:

1. Use the Hedge Budget, which is already an element of AG 49-A, for each indexed account.
2. Use a Black-Scholes fair-market value of the currently offered index participation in each indexed account.
3. Use the offered Fixed Account rate as the maximum illustrated rate for all indexed accounts.

Each of these solutions has merits and potential implementation challenges, but all are fundamentally straightforward, consumer-friendly and more consistent with other NAIC frameworks. In our view, removing the lookback would actually be an easier and quicker approach than maintaining it with new restrictions, as in Path 1.

### **Recommended Approach**

Our view is that regulators would be well served to provide clarity on whether the lookback should be maintained or removed before asking for details regarding specific solutions. It is the necessary first step.

Our concern with maintaining the lookback that there may be other loopholes not contemplated by these changes. The lookback has been the root cause of all previous regulatory inquiries and will likely continue to be a cause for future inquiries if maintained.

Furthermore, we do not believe that there is any reason – beyond continuity with previous guidelines – to maintain the lookback. It is not necessary to use the lookback to explain how Indexed UL works. Instead, our experience is that the lookback *distracts* from the mechanics of the product by creating the perception of illustrated values as a performance projection, which is not the intended use for illustrations.

As a result, we recommend that regulators pursue solutions that do not incorporate the lookback, all of which have merit and should be discussed amongst regulators, industry and interested parties to find the most workable and consumer-friendly solution. We look forward to being a part of that process.

**Bobby Samuelson**  
Executive Editor

The Life Product Review

**Sheryl J. Moore**  
President & CEO

Moore Market Intelligence

Oct. 12, 2022

**Please comment on:**

- The concept described on the October 12 Subgroup call of whether products and strategies associated with the same hedge budget should illustrate the same.

# Corporate Credit & Bond Fund Returns— Stylized Facts, Acceptance Criteria, and a Simplified Model

Jason Kehrberg, MAAA, FSA  
Chairperson, Economic Scenario Generator Work Group (ESGWG)

Hal Pedersen, MAAA, ASA  
Member, Economic Scenario Generator Work Group (ESGWG)

Iouri Karpov, MAAA, FSA  
Member, Economic Scenario Generator Work Group (ESGWG)

National Association of Insurance Commissioners (NAIC) Life Actuarial (A) Task Force (LATF)  
December 11, 2022

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## Agenda—Corporate Credit & Bond Fund Returns

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1. Background
2. Stylized Facts
3. Acceptance Criteria
4. A Simplified Model
5. Discussion and Q&A
6. Appendices

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3

# 1.

## Background

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## Background

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LATF asked the ESGWG to deliver a series of presentations focused on proposing qualitative **Stylized Facts** and quantitative **Acceptance Criteria** for the three major components of an ESG used for statutory reporting purposes: **Interest Rates, Equity Returns, and Corporate Bond Fund Returns.**

### *Prior presentations in this series:*

- A Framework for Working with ESGs (8/8/22)
- ESG Governance Considerations (8/8/22)
- Equity Returns—Stylized Facts (8/9/22)

### *This and future presentations in this series:*

- **Corporate Credit & Bond Fund Returns—Stylized Facts, Acceptance Criteria, and a Simplified Model**
- Interest Rates—Stylized Facts and Acceptance Criteria
- Equity Returns—Acceptance Criteria

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**Background (continued)**

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This presentation proposes **Stylized Facts** and **Acceptance Criteria** for Corporate Credit Spreads and Bond Index Fund Returns that (a) are independent of any specific ESG model, (b) can be used to identify and evaluate candidate ESG models, and (c) can be used to evaluate a set of stochastic scenarios.

In addition to Stylized Facts and Acceptance Criteria, this presentation also proposes a **Simplified Model**.

- Regulators expressed interest in the ESGWG proposing an alternative corporate bond fund return model that is **fully documented** so that the model can be appropriately reviewed and understood.
- Like GEMS, the simplified model simulates **four** U.S. corporate bond fund indices →

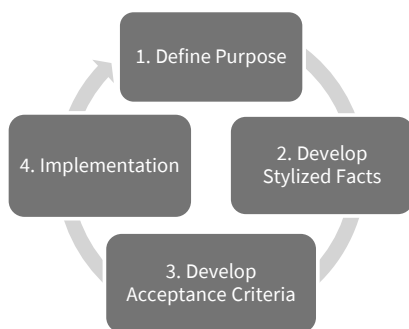
Label	Bond Fund Index
<b>IG 1-5</b>	U.S. Corp. Investment Grade 1-5 year
<b>IG 5-10</b>	U.S. Corp. Investment Grade 5-10 year
<b>IG Long</b>	U.S. Corp. Investment Grade Long (10-30 year)
<b>HY</b>	U.S. Corp. High Yield (Below Investment Grade)

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**A framework for developing, implementing, and evaluating ESGs and the scenario sets they produce**

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- 1. Define Purpose:** The intended purpose of the ESG informs the economic variables to be simulated and the relative importance of their “stylized facts.”
- 2. Develop Stylized Facts:** Stylized facts describe properties of the economic variables to be simulated. They are based on historical market data and economic theory and are prioritized relative to the defined purpose at hand. The establishment of stylized facts is critical for selecting candidate ESG models and a key prerequisite for the development of acceptance criteria.
- 3. Develop Acceptance Criteria:** A set of quantitative metrics or target values at different time horizons or in different economic conditions used to ensure the scenarios produced by the ESG are consistent with defined stylized facts.
- 4. Implementation:** ESG models are selected based on their ability to reflect defined stylized facts, then calibrated in accordance with acceptance criteria. Scenario sets are validated against defined acceptance criteria. This is an iterative process. It is important to periodically review and recalibrate the ESG as market conditions change over time.

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# 2.

## Stylized Facts

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### Groupings for Stylized Facts

Stylized Facts have been grouped into 6 categories with 1 to 3 Stylized Facts each:

- 3 categories for **Corporate Credit Spreads**
- 3 categories for **Bond Index Fund Returns**



#### Corporate Credit Spreads

1. General nature of credit markets and credit spreads
2. Relation across qualities and maturities
3. Relation to other market variables

#### Bond Index Fund Returns

4. General nature of bond index funds
5. Bond index fund return dynamics
6. Relation to other asset classes

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**1. Corporate Credit Spreads**—General nature of credit markets and credit spreads

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- a. Credit markets tend to be cyclical with elevated defaults and migrations at the end of credit cycles. Credit-related losses tend to be “lumpy” or episodic.
- b. Credit spreads are positive and have a strong tendency to revert to long-term normative levels (generally within three to four years).
- c. Credit spreads exhibit volatility clustering (i.e., regimes of high and low volatility), and volatility has a strong tendency to revert to long-term normative levels.

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**2. Corporate Credit Spreads**—Relation across qualities and maturities

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- a. As a bond’s credit quality decreases credit spreads, spread volatility, and the risk of loss increase.
- b. Longer maturity bonds generally have higher credit spreads than shorter maturity bonds. However, the credit spreads on shorter maturity bonds are more sensitive to current market conditions, so during market stresses credit spreads on shorter maturity bonds may increase more than credit spreads on longer maturity bonds.
- c. Credit spreads for different qualities and maturities tend to be strongly correlated (e.g., 80% or more).

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**3. Corporate Credit Spreads**—Relation to other market variables

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- a. Credit spreads tend to be higher and more volatile in equity bear markets (i.e., strong positive correlation to equity volatility, strong negative correlation to equity returns).
- b. Credit spreads tend to be negatively correlated with Treasury rates (i.e., flight to quality during market stress).

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**4. Bond Index Fund Returns**—General nature of bond index funds

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- a. A corporate bond fund is generally actively managed (regularly rebalanced) to meet defined maturity and quality targets (e.g., 5- to 10-year investment grade bonds) by trading individual bonds into and out of the fund. Such trading tends to increase when the corporate bond market experiences high levels of credit migration.

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## 5. Bond Index Fund Returns—Bond index fund return dynamics

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- a. Bond index fund total returns reflect the impact of risk-free rates (and changes in risk-free rates) as well as credit-related returns in “excess” of risk-free rates.
  - **Total return** = Risk free return + Excess return
  - **Excess return** = Spread-based return - Frictional costs
  - **Spread-based return** reflects credit spread income and price returns (i.e., changes in market price due to spread movement).
  - **Frictional costs** reflect costs due to defaults (net of recoveries), migrations (e.g., selling downgraded bonds at a loss when they no longer meet the fund’s quality targets), and rebalancing.
- b. Bond index fund returns vary with the credit cycle.
  - **Spread-based return** tends to decline significantly when spreads explode but then recover as spreads mean revert and migrations/defaults occur (i.e., the portfolio is purged).
  - **Frictional costs** (which are generally not recoverable) tend to cluster and accumulate rapidly as bonds migrate/default, with severity depending on the magnitude and duration of the credit cycle.

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## 6. Bond Index Fund Returns—Relation to other asset classes

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- a. Bond funds have risk/reward relationships that are generally consistent with other asset classes over long horizons.
- b. Credit spreads for bond funds held in the separate account should be consistent with economic assumptions for bonds held in the general account.

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## Goals related to bond fund scenarios from Conning/NAIC 12/17/20 presentation to LATF

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### Goals relating to equity and bond fund scenarios:

1. Returns should be provided for funds representative of those offered in U.S. insurance products.
2. The ESG should be calibrated using an appropriate historical period.

### Goals relating to the bond fund scenarios:

8. The same model should be used to produce bond fund returns for the Basic and Robust Data Sets\*, and the returns should reflect credit rating transitions, defaults, and dynamic spreads.
9. Separate yield curves should be generated by rating, and they should be linked to each other.
10. The spread between Treasuries and corporate bonds should be stochastic.
11. The ESG should include bond credit rating transitions and they should be dynamic.

\* Only goals that were related to the bond fund scenarios are listed above (goals 3-7 were only related to the equity scenarios).

- These goals are generally consistent with the stylized facts presented on the prior two slides.
- Note that stylized facts are generally *prioritized* based on the intended application, but the stylized facts themselves are generally independent of the intended application (largely based on historical data, sometimes supplemented with forward looking views).
- Note that stylized facts and their prioritization are generally independent of the model since models differ in their ability to reflect the various market properties described by stylized facts.

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# 3.

## Acceptance Criteria

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**Given the intended purpose, acceptance criteria should be consistent with the Valuation Manual**

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VM-20 Section 9.F. prescribes deterministic tables of baseline defaults, current spreads, and ultimate spreads for projecting general account **individual bonds**.

- VM-20 prescribed spreads grade from current to ultimate over the first four years of the projection.
- VM-20 prescribed baseline default costs represent the annualized average default cost over the remaining life of a bond given its credit rating and weighted average life at the start of the projection.

The ESG produces bond fund returns for projecting separate account **bond funds**.

- These bond fund return scenarios should be consistent with VM-20’s prescribed tables of spreads and defaults for use when projecting individual bonds in the general account.
- Bond fund indices experience significant frictional costs compared to individual bonds that are bought and held (largely from having to periodically rebalance bonds in the fund as they move outside the fund’s target range for credit quality, or maturity).

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**Credit spread steady-state targets and mean reversion should be consistent with VM-20**

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Steady state credit spread targets:

- Determined by averaging VM-20 general account fixed income ultimate spreads at [12/31/21].

Steady state credit spread targets	IG 1-5	IG 5-10	IG Long	HY
Quality range	[Aa3/AA- to Baa1/BBB+]	[Aa3/AA- to Baa1/BBB+]	[Aa3/AA- to Baa1/BBB+]	[Ba3/BB- to B1/B+]
Maturity (WAL) range	[1 to 5 years]	[>5 to 10 years]	[>10 to 30 years]	[1 to 10 years]
Target (avg. VM-20 ult. spread at [12/31/21])	<b>107 bps</b>	<b>141 bps</b>	<b>163 bps</b>	<b>448 bps</b>

Mean reversion of credit spreads:

- VM-20 prescribes a 4-year grading period for general account fixed income spreads.
- Let “m” = the number of months into the projection when the average modeled credit spread is **halfway** between initial and steady state levels.
- Acceptance criteria: “m” should be between [22] and [26] (i.e., around two years).

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**Target excess returns are derived from average VM-20 spreads and the historical relationship between excess returns and Option-Adjusted Spread (OAS)** 19

Historical averages (1999 to 2021) from Bloomberg (bps)	IG 1-5	IG 5-10	IG Long	HY
Option Adjusted Spread (OAS)	124	156	1.80	534
Spread Return (determined from OAS and duration series)	129	168	1.95	559
Excess Return	98	100	88	311
Frictional Cost (Spread Return - Excess Return)	31	68	107	248

Historical OAS split –Frictional Cost vs. Excess Return	IG 1-5	IG 5-10	IG Long	HY
Frictional Cost % of OAS	25%	44%	60%	46%
Excess Return % of OAS	75%	56%	40%	54%

Steady state targets (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target Excess Return (Target OAS * Excess Return % of OAS)	80	79	66	240
Criteria for avg. annualized Excess Return in years [20-30]	80 ±[10]	79 ±[10]	66 ±[10]	240 ±[20]

- Frictional Cost % of OAS increases with fund maturity, as longer debt incurs higher migration costs in the IG corporate universe.
- IG 5-10 and HY both have maturities of about seven years as well as similar Frictional Cost % of OAS.
- [Documentation on Bloomberg's excess return definitions/calculations \(pp. 85-88 of linked doc\)](#)

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**Proposed cap on maximum excess return** 20

The acceptance criteria on the previous slide ensures the **average** (across all scenarios) modeled excess return in years [20-30] is close to the target excess return. The additional guardrail below protects against overly optimistic risk/reward relationships in an individual scenario.

- Rationale: The high spreads observed during periods of market stress have generally been offset by increased frictional costs and decreased performance of bond index funds (especially for IG Long and HY). Over the long term the upside on credit returns appears limited (capped).
- Let “a” = Target OAS (i.e., average VM-20 ultimate spread at [12/31/21]) + [50 bps].
- Let “b” = any one scenario’s annualized excess return over years [0-30] of the projection, where initial spread level was set equal to ultimate target OAS
- “b” should not exceed “a”.

Illustrative application of additional guardrail (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target OAS + 50 bps (“a”)	157	191	213	498
Max annualized excess return over years [20-30]:				
Scenario Set ABC (“b”)	190	160	200	660
Scenario Set XYZ (“b”)	140	120	160	350

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**Bond fund returns are correlated with equity returns and interest rates  
 (and with other bond fund indices)**

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Modeled Spreads for bond indices should reflect a strong relationship to equity (SPX).

- Positive correlation of [60% ±10%] to SPX Variance
- Negative correlation of [-60% ± 10%] to SPX Return

Credit risk tends to increase during volatile bear markets, which increases credit spreads.

Note: Acceptance criteria for the correlation of total bond index fund returns to equity and interest rates could also be developed.

Modeled Excess Returns for bond indices should also reflect a strong relationship to equity; but directionally inverse to Modeled Spreads.

- Negative correlation to SPX Variance
- Positive correlation to SPX Return

Frictional costs tend to increase during volatile bear markets, which also decreases excess returns.

Modeled Spreads and Excess Returns should reflect a very strong relationship across bond indices.

- Very similar dynamics → Correlations between bond fund indices should be greater than [80%].

Supporting Data:  
 Historical Correlations between Spread and Equity/Interest Rate Markets

	Int Rate Level	SPX Variance	SPX Return	IG 1-5 Spread	IG 5-10 Spread	IG Long Spread	HY Spread	Data Period
Int Rate Level	1.00							12/1960 - 12/2021
SPX Variance	0.02	1.00						12/1960 - 12/2021
SPX Return	-0.09	-0.68	1.00					12/1960 - 12/2021
IG 1-5 Spread	-0.18	0.52	-0.54	1.00				1/1990 - 12/2021
IG 5-10 Spread	-0.27	0.59	-0.63	0.92	1.00			1/1999 - 12/2021
IG Long Spread	-0.30	0.57	-0.60	0.82	0.94	1.00		1/1990 - 12/2021
HY Spread	-0.32	0.62	-0.67	0.80	0.87	0.84	1.00	11/1995 - 12/2021

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4.

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**A Simplified Model**

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## A simplified model for returns on corporate bond fund indices

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The simplified model is consistent with Conning's previously presented goals and the ESGWG's recommended stylized facts and acceptance criteria.

The simplified model is fully documented, specified, and calibrated. It has been peer reviewed and is ready for implementation.

The model simulates excess returns on the same four corporate bond fund indices.

- Excess return = Spread-based return – Frictional costs.
- Ultimately, Total return (Treasury return + Excess return) would be simulated by adding excess returns to appropriately calculated and internally consistent returns on government bond funds of similar maturity profiles.

The model is simplified in that it implicitly reflects the impact of credit migration and defaults.

- For each of the funds in GEMS, the simplified model derives excess credit-related returns using stochastic credit spreads by rating but reflects the impact of credit migration, defaults, and recoveries as simplified frictional costs.
- The historically implied frictional cost is fitted using a linear functional relationship between the trailing OAS and the costs to rebalance the fund. This fitting approach ensures the frictional cost is positive and increases with the spread.

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## A simplified model for returns on corporate bond fund indices (cont.)

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Steady-state credit spread targets and mean reversion speeds are consistent with VM-20 general account fixed income spreads.

Duration is estimated as a function of bond maturity and bond yield.

- The model captures fluctuations in long maturity fund durations observed when the level of yield changes.

Modeled relationship between credit spreads

- We propose a single random driver for all the indices to ensure rational behavior of credit spreads and capture 90% of spread variation across the indices.

Relationship to Equity and Interest Rates

- Using a simplified correlation matrix, the model captures relationships between credit spreads, equity volatility, equity return, interest rate level, and interest rate volatility.
- This correlation matrix approach can be used to generate stochastic bond index fund excess returns which are consistent with any underlying stochastic interest rate and/or equity model.

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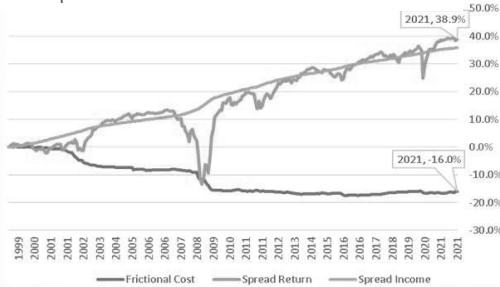
## Simplified decomposition of bond index excess return into spread return and frictional cost

25

*Excess Return = Spread Return – Frictional Cost*, where:

- $Spread\ Return_t = Spread_{t-1}\Delta t - Duration_{t-1}(Spread_t - Spread_{t-1})$  reflects the earned credit spread as well as the change in market price due to spread movement.
- *Frictional Cost* reflects the effects of defaults, migrations, and otherwise forced rebalancing that occurs within the index fund.

Components of Cumulative Excess Returns: IG 5-10



- Cumulative Excess Return from 1999 to 2021 was 22.9% (100bps/year), as a combination of 38.9% in spread return (average OAS of 168bps) offset by frictional losses of 16% (70bps/year).
- Spread Return was calculated using Bloomberg OAS and duration time series, while the implied Frictional Cost was calculated as Excess Return less Spread Return.
- Spread Return varies with level of spreads, but ultimately reverts to earned spread income.
- Frictional Cost tends to be relatively stable, with costs accruing aggressively in early 1990s, 2000s (.com bubble) and in 2008 (financial crisis) as defaults and migrations punctuate the end of a credit cycle.

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## Spread and frictional cost dynamics—Historical behavior

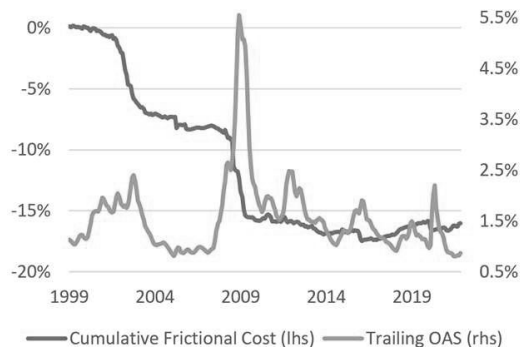
26

OAS exhibits strong mean reversion, zero bound, and clustering. These dynamics, which drive the volatility of Excess Return, are native to a lognormal Ornstein-Uhlenbeck “OU” process.

Cumulative Frictional Cost exhibits a relatively smooth step-like progression with most of the costs occurring during periods of elevated spreads (e.g., during breaks in the credit cycle).

Note: The relationship between spreads, equity returns, and interest rates is captured by correlating the random factors based on the historical correlation of spread residuals.

Spreads and Frictional Costs (IG 5-10)



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Spread and frictional cost dynamics—Simplified modeling

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**Credit Spreads:** Simplified model based on mean reverting stochastic processes for each credit rating.

$$ls_t = \min(ls_{t-1} + \beta(\ln(\tau) - ls_{t-1}) + \sigma Z_{ls,t}, \max\_spread)$$

where  $spread_t = e^{ls_t}$  subject to reasonable cap,  $ls_0 = \ln(\text{init\_spread})$ ,  $\tau$  (Target OAS (adj)), and  $\beta$  (mean reversion).

**Frictional Cost:** Simplified model based on trailing 3-month credit spreads.

$$cost_t = a + m_1 \min(\bar{s}_t, \kappa) + m_2 \max(\bar{s}_t - \kappa, 0)$$

where  $\bar{s}_t = \frac{1}{3} \sum_{i=1,3} spread_{t-i}$  is the 3-month trailing avg spread, and  $a$  = drift.

**Excess Return:** Simplified model based on Excess Return = Spread Return – Frictional Cost.

$$Excess\ Return_t = [spread_{t-1} \Delta t - \frac{1}{2}(Dur_t + Dur_{t-1})(spread_t - spread_{t-1})] - cost_t$$

where:

$Dur_t$  is duration of the underlying fund based on its assumed maturity and semi-annual coupon determined as  $coup_t = UST_{t,mat} + spread_t$ .

$Dur_t$  is determined using the closed-form approximation  $Dur_t = .5(cS_n + nx^n)$  where  $c = \max(\frac{1}{2}coup_t, .000001)$ ,  $n = 2 \times maturity$ ,

$x = \frac{1}{1+c}$ , and  $S_n = \frac{x^{-(n+1)}x^{n+1} + nx^{n+2}}{(1-x)^2}$  is the partial sum representing par-coupon durations, while  $nx^n$  represents the duration of the principal payment.

Calibration of the Spread component

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The Spread component is calibrated to monthly historical OAS data sourced from relevant Bloomberg indices using Maximum Likelihood Estimation (MLE).

Index	Bloomberg Ticker	Data Period	Avg. Quality	Avg. Maturity (years)	Avg. OAS (basis points)	Avg. VM-20 Ultimate Spreads at 12/2021 (basis points)
U.S. Corp. IG 1-5	BUC1TRUU	1/1990 - 12/2021	A2 - Baa1	3	112	107
U.S. Corp. IG 5-10	BCR5TRUU	1/1999 - 12/2021	A2 - Baa1	7	156	141
U.S. Corp. IG Long (10-30)	LD07TRUU	1/1990 - 12/2021	A2 - Baa1	23	152	163
U.S. Corp. HY	LF98TRUU	11/1995 - 12/2021	Ba3 - B2	7	509	448

- A single shared random factor is used for all four indices to ensure reasonable relationships between indices (captures 90% of spread variation across the indices).
- Spread mean reversion ( $\beta$ ) was set to 3% for all four bond fund indices to ensure reasonable relationships between indices and consistency with VM-20's 4-year grading period.
- Spread volatility ( $\sigma$ ) was adjusted accordingly to preserve historical steady state process variance.
- Spread targets ( $\tau$ ) were adjusted to ensure average modeled spreads align with Target OAS (average VM-20 ultimate spread at [12/31/21]).

## Calibration of the Frictional Cost component

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The Frictional Cost component is calibrated to implied 3-month trailing frictional costs:

- Uses the same Bloomberg index data used to calibrate the Spread component.
- Implied frictional cost is determined as the difference between Bloomberg's excess return data and a spread return calculated using Bloomberg's historical duration and OAS data.

The calibration is performed using least squares optimization with constraints:

- Constraint: Drift ( $a$ )  $\geq .0001$  (ensures a minimum cost).
- Constraint: Multipliers  $m1 \geq 0$  for IG and  $m1 \geq .001$  for HY (ensures dynamic behavior when spreads are low).
- A penalty function is used to constrain cumulative estimated cost to equal historical Frictional Cost during the calibration period (ensures modeled costs will be in line with historical spread levels).

Adjustment to drift in order to meet average Excess Return criteria:

- Drift parameter ( $a$ ) was adjusted to directly match the middle of the excess return criteria band on slide 19.

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## Proposed parameter values

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*Parameters for the simplified model  
 of excess returns on bond index funds*

### Spread Model

	IG 1-5	IG 5-10	IG Long	HY
<b>tau</b> ( $\tau$ , spread target)	0.00920	0.01298	0.01493	0.04134
<b>beta</b> ( $\beta$ , mean rev.)	0.03	0.03	0.03	0.03
<b>sigma</b> ( $\sigma$ , volatility)	0.13557	0.09756	0.10181	0.09565
<b>maturity</b>	3.0	7.0	23.0	7.0
<b>max_spread</b>	0.06900	0.05900	0.05000	0.18329
<b>init_spread (12/31/20)</b>	Market based inputs			
VM-20 spread target	0.01069	0.01408	0.01627	0.04475

### Frictional Cost Model

	IG 1-5	IG 5-10	IG Long	HY
<b>drift</b> ( $a$ )	0.00012	0.00018	0.00019	0.00034
<b>kappa</b> ( $\kappa$ )	0.01239	0.01362	0.01556	0.03650
<b>mult1</b> ( $m_1$ )	0.00000	0.00000	0.00448	0.00100
<b>mult2</b> ( $m_2$ )	0.06265	0.13773	0.18706	0.12111

*Parameters (correlations) for implementing the simplified  
 model alongside existing interest and equity models.*

### Simplified Corr. Matrix based on ACLI v1.3 & SLV Equity

	Rate Log Vol	Log Long Rate	SPX Log Vol	SPX Return	Credit Spread
Rate Log Vol	1.00				
Log Long Rate	0.00	1.00			
SPX Log Vol	0.00	0.00	1.00		
SPX Return	0.00	0.00	-0.63	1.00	
Credit Spread	0.20	-0.35	-0.55	-0.60	1.00

### Simplified Corr. Matrix based on GEMS GFF rates & Heston Equity

	CIR ("level")	SPX Variance	SPX Return	Credit Spread
CIR ("level")	1.00			
SPX Variance	0.00	1.00		
SPX Return	0.00	-0.68	1.00	
Credit Spread	-0.25	0.60	-0.60	1.00

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Excess return cumulative wealth factors—comparison to GEMS

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The simplified model satisfies the acceptance criteria by design (its parameters were explicitly set to meet the criteria).

However, since GEMS results were readily available, and as an additional reasonableness check, the next four slides provide a comparison to GEMS.

- GEMS excess returns were determined by taking total returns from the four corporate bond fund indices and subtracting total returns from government bond fund indices with similar maturity profiles.

Summary

- **IG 1-5** and **IG 5-10**: Simplified model and GEMS cumulative excess return distributions are relatively similar.
- **IG Long**: Simplified model cumulative excess return distribution is generally lower than GEMS.
- **HY**: Simplified model cumulative excess returns are significantly lower than GEMS in the right tail of the distribution.

Excess return cumulative wealth factors—IG 1-5

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IG 1-5: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.93	0.91	0.93	0.94	0.98	1.01	1.07
0.5%	0.97	0.96	0.99	1.01	1.04	1.08	1.11
1.0%	0.98	0.97	1.00	1.02	1.05	1.08	1.12
2.5%	0.98	0.98	1.01	1.04	1.06	1.10	1.13
5.0%	0.99	0.99	1.02	1.04	1.08	1.11	1.15
10.0%	0.99	1.00	1.03	1.05	1.09	1.13	1.17
25.0%	1.00	1.01	1.04	1.07	1.11	1.15	1.20
50.0%	1.00	1.02	1.05	1.09	1.14	1.19	1.23
75.0%	1.00	1.02	1.07	1.11	1.17	1.22	1.27
90.0%	1.01	1.03	1.08	1.13	1.19	1.25	1.30
95.0%	1.01	1.03	1.09	1.15	1.20	1.26	1.33
97.5%	1.01	1.04	1.09	1.16	1.22	1.28	1.34
99.0%	1.01	1.04	1.10	1.17	1.24	1.30	1.36
99.5%	1.01	1.04	1.11	1.17	1.25	1.31	1.38
Max	1.01	1.06	1.14	1.23	1.29	1.38	1.46

IG 1-5: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.92	0.91	0.93	0.96	0.98	1.00	1.03
0.5%	0.96	0.96	0.99	1.02	1.04	1.07	1.10
1.0%	0.97	0.97	1.00	1.03	1.05	1.08	1.12
2.5%	0.97	0.98	1.01	1.04	1.07	1.10	1.13
5.0%	0.98	0.99	1.02	1.05	1.08	1.11	1.14
10.0%	0.99	1.00	1.03	1.06	1.09	1.12	1.16
25.0%	1.00	1.01	1.04	1.07	1.11	1.14	1.18
50.0%	1.00	1.02	1.05	1.09	1.12	1.16	1.20
75.0%	1.00	1.03	1.06	1.10	1.14	1.19	1.23
90.0%	1.01	1.03	1.07	1.11	1.16	1.21	1.27
95.0%	1.01	1.03	1.07	1.12	1.17	1.23	1.29
97.5%	1.01	1.03	1.08	1.13	1.19	1.25	1.32
99.0%	1.01	1.04	1.08	1.14	1.20	1.28	1.35
99.5%	1.01	1.04	1.09	1.15	1.22	1.30	1.38
Max	1.01	1.05	1.11	1.21	1.33	1.53	1.75

Excess return cumulative wealth factors—IG 5-10

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IG 5-10: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.85	0.76	0.75	0.80	0.84	0.92	0.93
0.5%	0.93	0.88	0.91	0.93	0.96	1.00	1.06
1.0%	0.94	0.90	0.93	0.95	0.99	1.03	1.08
2.5%	0.95	0.93	0.95	0.99	1.02	1.06	1.10
5.0%	0.96	0.95	0.97	1.01	1.05	1.09	1.13
10.0%	0.97	0.97	1.00	1.03	1.07	1.12	1.16
25.0%	0.99	1.00	1.03	1.07	1.11	1.15	1.20
50.0%	1.00	1.02	1.06	1.10	1.14	1.19	1.23
75.0%	1.01	1.04	1.08	1.12	1.17	1.21	1.26
90.0%	1.02	1.05	1.09	1.13	1.18	1.23	1.28
95.0%	1.02	1.05	1.10	1.14	1.19	1.24	1.30
97.5%	1.03	1.06	1.10	1.15	1.20	1.25	1.31
99.0%	1.03	1.06	1.11	1.16	1.21	1.26	1.32
99.5%	1.03	1.07	1.11	1.16	1.21	1.27	1.33
Max	1.04	1.08	1.13	1.18	1.24	1.29	1.37

IG 5-10: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.86	0.81	0.78	0.83	0.87	0.89	0.91
0.5%	0.91	0.88	0.92	0.95	0.98	1.02	1.06
1.0%	0.92	0.91	0.94	0.97	1.00	1.04	1.08
2.5%	0.94	0.93	0.96	1.00	1.03	1.07	1.12
5.0%	0.95	0.95	0.98	1.02	1.06	1.10	1.14
10.0%	0.97	0.97	1.01	1.04	1.08	1.13	1.17
25.0%	0.99	1.00	1.04	1.08	1.13	1.17	1.22
50.0%	1.00	1.03	1.07	1.12	1.17	1.22	1.28
75.0%	1.01	1.04	1.09	1.14	1.20	1.26	1.32
90.0%	1.02	1.05	1.10	1.16	1.22	1.29	1.36
95.0%	1.02	1.06	1.11	1.17	1.24	1.31	1.38
97.5%	1.02	1.06	1.12	1.18	1.25	1.32	1.40
99.0%	1.02	1.06	1.12	1.19	1.26	1.34	1.43
99.5%	1.02	1.06	1.13	1.20	1.27	1.36	1.45
Max	1.02	1.07	1.16	1.25	1.36	1.45	1.62

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Excess return cumulative wealth factors—IG Long

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IG Long: Simplified							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.61	0.57	0.56	0.59	0.55	0.65	0.63
0.5%	0.77	0.68	0.70	0.71	0.74	0.76	0.81
1.0%	0.80	0.71	0.73	0.75	0.78	0.80	0.84
2.5%	0.84	0.76	0.79	0.81	0.84	0.87	0.90
5.0%	0.87	0.82	0.84	0.86	0.89	0.92	0.95
10.0%	0.90	0.87	0.89	0.92	0.95	0.99	1.02
25.0%	0.95	0.96	0.98	1.01	1.04	1.08	1.11
50.0%	1.01	1.03	1.07	1.10	1.13	1.17	1.21
75.0%	1.05	1.09	1.13	1.16	1.21	1.25	1.29
90.0%	1.09	1.14	1.18	1.21	1.26	1.31	1.36
95.0%	1.11	1.16	1.20	1.24	1.29	1.34	1.39
97.5%	1.12	1.18	1.22	1.26	1.32	1.36	1.42
99.0%	1.14	1.20	1.25	1.29	1.34	1.39	1.45
99.5%	1.15	1.21	1.26	1.30	1.36	1.41	1.48
Max	1.19	1.27	1.31	1.39	1.43	1.49	1.58

IG Long: GEMS							
	Proj. year						
	1	5	10	15	20	25	30
Min	0.73	0.63	0.60	0.68	0.71	0.78	0.78
0.5%	0.82	0.77	0.81	0.86	0.88	0.93	0.97
1.0%	0.84	0.80	0.84	0.89	0.92	0.98	1.02
2.5%	0.87	0.85	0.89	0.94	0.98	1.03	1.08
5.0%	0.90	0.88	0.93	0.98	1.03	1.08	1.13
10.0%	0.93	0.93	0.97	1.03	1.08	1.13	1.19
25.0%	0.97	0.99	1.04	1.10	1.15	1.22	1.28
50.0%	1.00	1.04	1.10	1.17	1.23	1.30	1.38
75.0%	1.03	1.08	1.15	1.22	1.30	1.38	1.46
90.0%	1.04	1.11	1.19	1.27	1.36	1.44	1.53
95.0%	1.05	1.12	1.21	1.29	1.38	1.48	1.57
97.5%	1.06	1.13	1.22	1.31	1.40	1.50	1.60
99.0%	1.06	1.14	1.24	1.33	1.43	1.54	1.64
99.5%	1.07	1.16	1.25	1.35	1.45	1.56	1.66
Max	1.08	1.19	1.30	1.41	1.55	1.63	1.80

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Excess return cumulative wealth factors—HY

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**HY: Simplified**

	Proj. year						
	1	5	10	15	20	25	30
Min	0.62	0.52	0.53	0.65	0.72	0.94	0.96
0.5%	0.81	0.74	0.82	0.90	1.00	1.13	1.33
1.0%	0.83	0.78	0.87	0.96	1.08	1.20	1.39
2.5%	0.87	0.84	0.94	1.04	1.17	1.32	1.49
5.0%	0.90	0.90	0.99	1.11	1.25	1.40	1.58
10.0%	0.92	0.95	1.06	1.19	1.34	1.50	1.69
25.0%	0.97	1.04	1.16	1.30	1.46	1.65	1.85
50.0%	1.02	1.12	1.25	1.40	1.59	1.79	2.01
75.0%	1.06	1.18	1.33	1.49	1.69	1.91	2.15
90.0%	1.09	1.22	1.38	1.55	1.76	2.00	2.26
95.0%	1.11	1.24	1.40	1.59	1.80	2.05	2.31
97.5%	1.12	1.26	1.43	1.61	1.83	2.08	2.36
99.0%	1.14	1.27	1.45	1.64	1.87	2.12	2.41
99.5%	1.14	1.28	1.46	1.66	1.89	2.15	2.44
Max	1.18	1.33	1.51	1.73	1.98	2.24	2.60

**HY: GEMS**

	Proj. year						
	1	5	10	15	20	25	30
Min	0.81	0.88	0.96	1.07	1.20	1.40	1.58
0.5%	0.90	0.97	1.10	1.22	1.36	1.53	1.72
1.0%	0.92	0.99	1.11	1.24	1.40	1.57	1.76
2.5%	0.94	1.02	1.15	1.29	1.44	1.63	1.83
5.0%	0.97	1.04	1.17	1.32	1.48	1.68	1.90
10.0%	0.99	1.07	1.20	1.35	1.54	1.74	1.98
25.0%	1.02	1.11	1.25	1.42	1.62	1.86	2.13
50.0%	1.05	1.14	1.30	1.50	1.74	2.02	2.35
75.0%	1.06	1.17	1.37	1.62	1.91	2.25	2.64
90.0%	1.07	1.21	1.46	1.77	2.12	2.52	2.99
95.0%	1.07	1.24	1.54	1.89	2.28	2.74	3.26
97.5%	1.08	1.27	1.63	2.04	2.44	2.98	3.59
99.0%	1.08	1.33	1.76	2.19	2.70	3.28	4.02
99.5%	1.08	1.38	1.87	2.35	2.92	3.57	4.38
Max	1.09	1.66	2.41	3.19	4.13	5.63	7.16

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# 5.

## Discussion and Q&A

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## Thank You

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### Contact:

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# 6.1

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## Appendix 1: Support for Stylized Facts

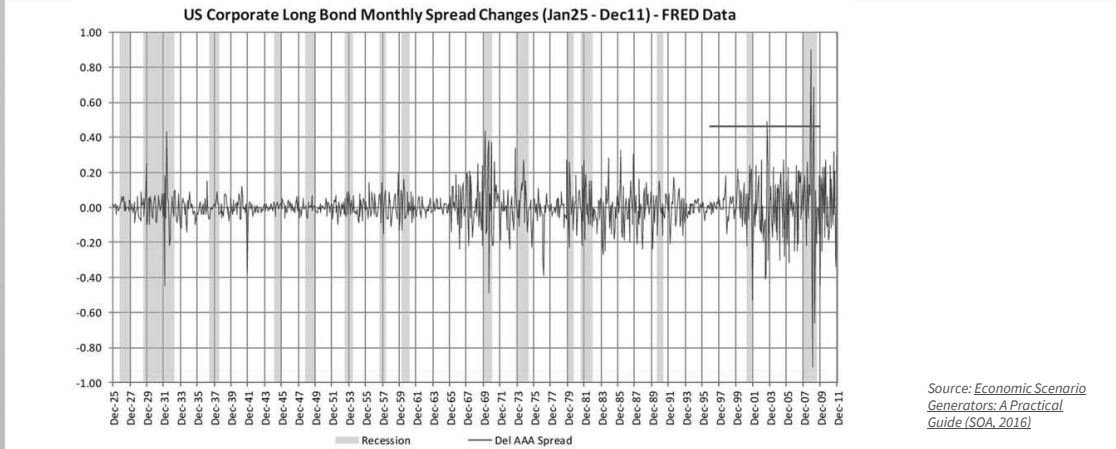
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Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1925–2011

39

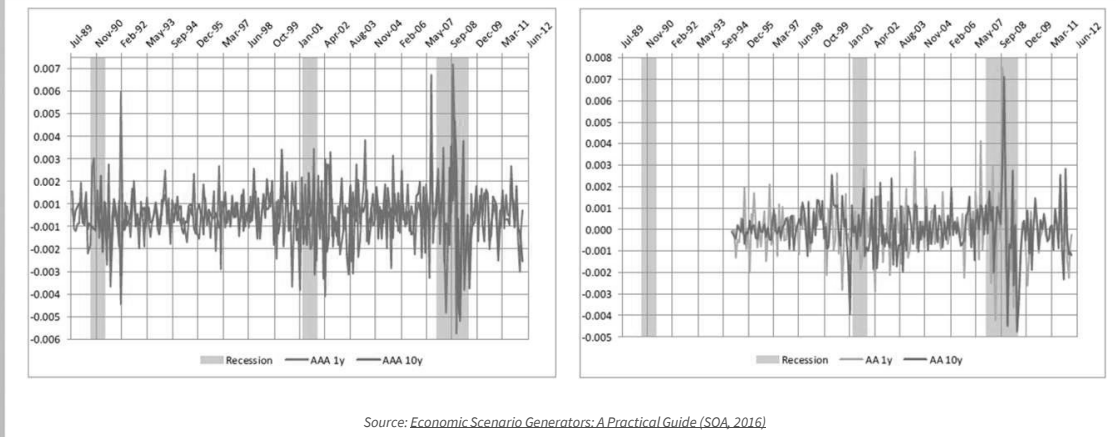


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Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1989–2012 (AAA, AA)

40

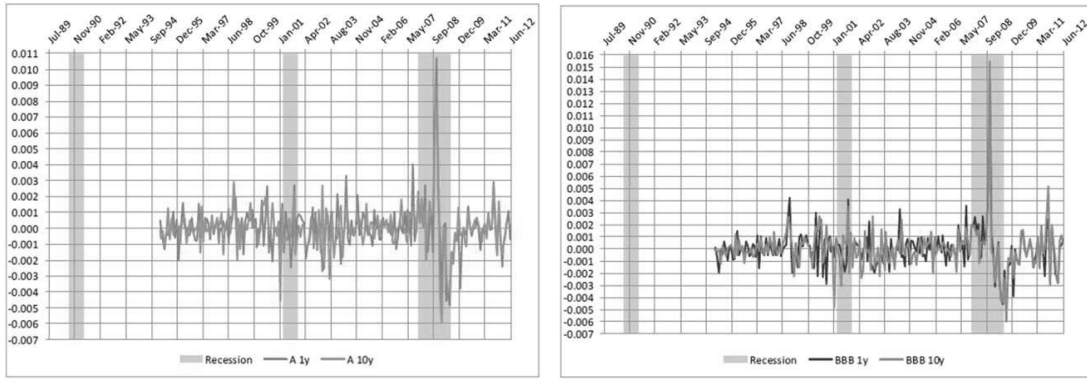


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Support for Stylized Facts:  
 Monthly changes in U.S. credit spreads, 1989–2012 (A, BBB)

41



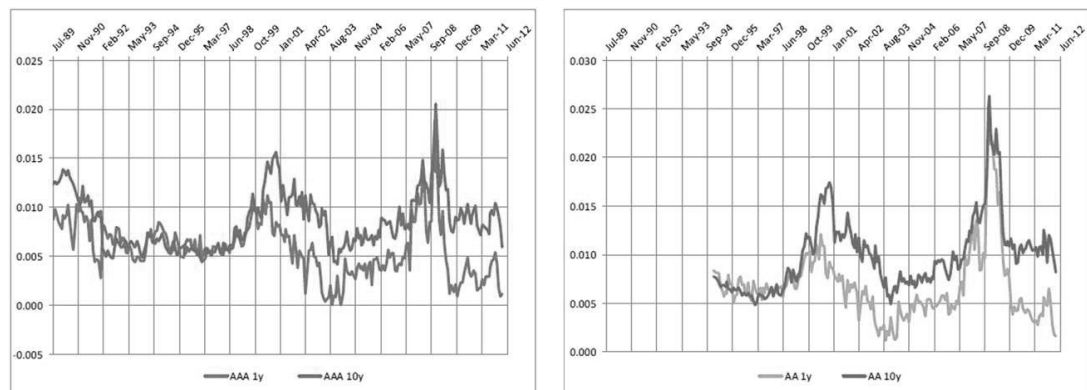
Source: *Economic Scenario Generators: A Practical Guide* (SOA, 2016)

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Support for Stylized Facts:  
 Spreads for U.S. industrial zero-coupon bonds, 1989–2012 (AAA, AA)

42



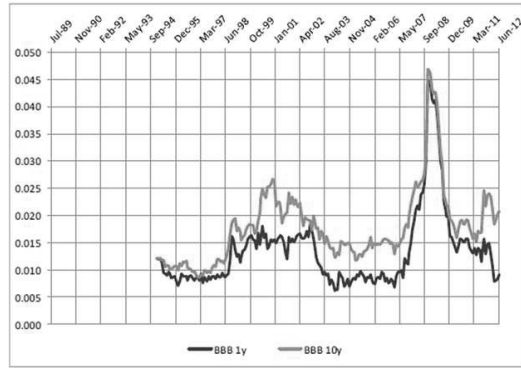
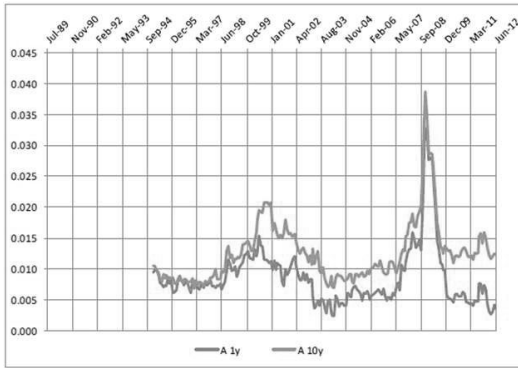
Source: *Economic Scenario Generators: A Practical Guide* (SOA, 2016)

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**Support for Stylized Facts:  
 Spreads for U.S. industrial zero-coupon bonds, 1989–2012 (A, BBB)**

43



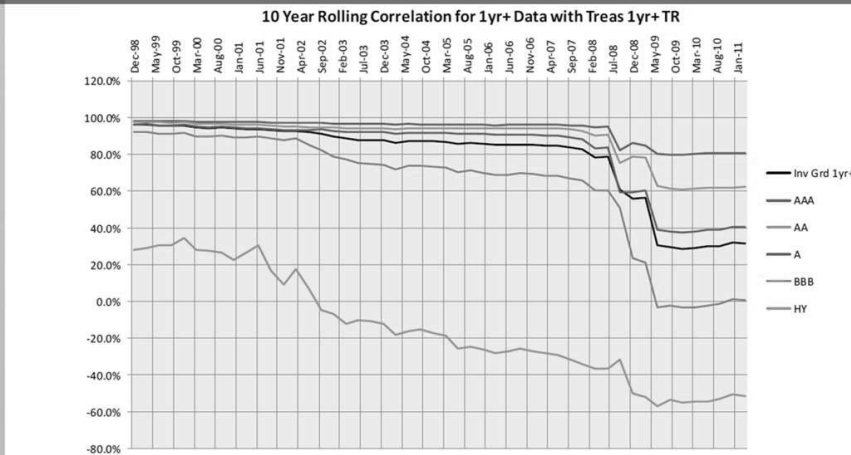
Source: *Economic Scenario Generators: A Practical Guide (SOA, 2016)*

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**Support for Stylized Facts:  
 Correlations between corporate bonds and Treasuries, 1998–2011**

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# 6.2

## Appendix 2: Support for Acceptance Criteria

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### Determining targets from VM-20 steady state spreads at 12/31/21

WAL	Aaa AAA	Aa1 AA+	Aa2 AA	Aa3 AA-	A1 A+	A2 A	A3 A-	Baa1 BBB+	Baa2 BBB	Baa3 BBB-	Ba1 BB+	Ba2 BB	Ba3 BB-	B1 B+	B2 B	B3 B-	Caa1 CCC+	Caa2 CCC	Caa3 CCC-	Ca CC
1	37.01	46.90	56.78	64.93	73.08	81.23	98.73	116.22	133.72	218.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
2	42.33	53.95	65.58	74.14	82.69	91.25	109.41	127.57	145.72	224.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
3	47.64	61.01	74.38	83.35	92.31	101.27	120.09	138.91	157.73	230.71	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
4	52.96	68.07	83.18	92.55	101.92	111.29	130.77	150.25	169.73	236.71	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
5	59.45	74.31	89.17	99.51	109.85	120.19	140.42	160.65	180.88	242.28	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
6	65.94	80.55	95.16	106.47	117.78	129.08	150.07	171.05	192.03	247.86	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
7	68.50	84.18	99.86	110.50	121.14	131.70	152.75	173.72	194.69	249.19	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
8	71.07	87.81	104.55	114.53	124.51	134.49	155.44	176.39	197.34	250.51	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
9	73.63	91.44	109.25	118.56	127.88	137.19	158.12	179.06	199.99	251.84	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
10	75.37	93.27	111.17	120.30	129.44	138.58	159.70	180.83	201.95	252.82	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
11	77.11	95.10	113.08	122.05	131.01	139.97	161.28	182.59	203.90	253.79	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
12	78.85	96.92	115.00	123.79	132.57	141.36	162.86	184.36	205.86	254.77	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
13	80.59	98.75	116.92	125.53	134.14	142.75	164.44	186.12	207.81	255.75	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
14	82.33	100.58	118.84	127.27	135.70	144.14	166.01	187.89	209.77	256.73	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
15	84.07	102.41	120.76	129.01	137.27	145.53	167.59	189.66	211.72	257.70	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
16	85.81	104.24	122.68	130.76	138.84	146.92	169.17	191.42	213.68	258.68	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
17	87.54	106.07	124.59	132.50	140.40	148.31	170.75	193.19	215.63	259.66	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
18	89.28	107.90	126.51	134.24	141.97	149.70	172.33	194.96	217.59	260.64	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
19	91.02	109.73	128.43	135.98	143.53	151.09	173.90	196.72	219.54	261.61	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
20	92.76	111.56	130.35	137.73	145.10	152.47	175.48	198.49	221.50	262.59	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
21	94.50	113.39	132.27	139.47	146.67	153.86	177.06	200.26	223.45	263.57	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
22	96.24	115.21	134.19	141.21	148.23	155.25	178.64	202.02	225.41	264.55	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
23	97.98	117.04	136.11	142.95	149.80	156.64	180.22	203.79	227.36	265.52	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
24	99.72	118.87	138.02	144.69	151.36	158.03	181.79	205.56	229.32	266.50	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
25	101.46	120.70	139.94	146.44	152.93	159.42	183.37	207.32	231.27	267.48	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
26	103.20	122.53	141.86	148.18	154.49	160.81	184.95	209.09	233.23	268.46	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
27	104.94	124.36	143.78	149.92	156.06	162.20	186.53	210.86	235.18	269.43	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
28	106.68	126.19	145.70	151.66	157.63	163.59	188.11	212.62	237.14	270.41	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
29	108.42	128.02	147.62	153.40	159.19	164.98	189.68	214.39	239.09	271.39	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32
30	110.16	129.85	149.53	155.15	160.76	166.37	191.26	216.15	241.05	272.37	303.68	361.21	418.74	476.27	533.79	688.10	842.40	996.71	1151.02	1305.32

	Quality Range	WAL Range	Avg. Spread
IG 1-5	[Aa3 - Baa1] [AA- - BBB+]	[1 to 5 yrs]	107
IG 5-10	[Aa3 - Baa1] [AA- - BBB+]	[>5 to 10 yrs]	141
IG Long	[Aa3 - Baa1] [AA- - BBB+]	[>10 to 30 yrs]	163
HY	[Ba3 - B1] [BB- - B+]	[1 to 10 yrs]	448

Source: VM-20 Tables H & I at 12/31/21

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### Simulated Excess Returns compared to Targets

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Average excess returns (from 20 to 30yr in the projection) are aligned with historically implied targets and meet acceptance criteria for average annualized Excess Return. Note that the cost drift parameters,  $a$ , have been adjusted to directly match the midpoint of the criteria range.

The standard deviation (volatility) of monthly excess returns in the scenarios scale with maturity and lower quality (as expected).

Steady state Targets (bps)	IG 1-5	IG 5-10	IG Long	HY
Target OAS (avg. VM-20 ult. spread at [12/31/21])	107	141	163	448
Target Excess Return (Target OAS * Excess Return % of OAS)	80	79	66	240
Criteria for avg. annualized Excess Return in years [20-30]	80 ±[10]	79 ±[10]	66 ±[10]	240 ±[20]

Simulation results (10,000 scenarios)	IG 1-5	IG 5-10	IG Long	HY
Avg. annualized Excess Return (bps)	80	79	66	240
Std. dev. annualized Excess Return (bps) (over entire proj.)	1.61%	3.06%	8.57%	8.63%

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### Distribution of Annualized Returns vs. Maximum Target

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Annualized cumulative excess returns over 30 years were simulated by setting initial spread level to target OAS (based on VM20 guidance).

Based on this “steady-state” simulation, the maximum excess return across 10k scenarios in the Simplified Model is well within the proposed Excess Return Cap.

Annualized Cumulative Excess Return over 30 years

	min	1%	10%	50%	90%	99%	max	Excess Return Cap	Target OAS
IG 1-5	0.22%	0.38%	0.51%	0.70%	0.89%	1.03%	1.26%	1.57%	1.07%
IG 5-10	-0.25%	0.24%	0.49%	0.70%	0.83%	0.92%	1.05%	1.91%	1.41%
IG Long	-1.56%	-0.58%	0.05%	0.63%	1.01%	1.23%	1.52%	2.13%	1.63%
HY	-0.12%	1.09%	1.75%	2.33%	2.71%	2.93%	3.19%	4.98%	4.48%

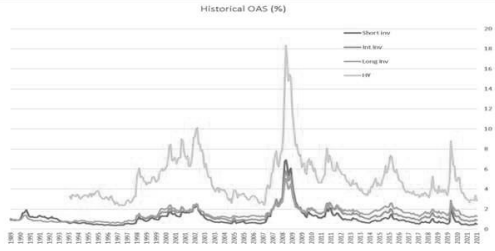
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### Spread and frictional cost dynamics—History

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- OAS exhibits mean reversion, 0-bound and clustering (OU process).
- Excess Return exhibits volatility driven by spread dynamics.



- Frictional Cost exhibits spikes at the break of the credit cycle when spreads are elevated.



**Simplified Decomposition of Bond Fund Excess Return:**

**Excess Return = Spread Return – Frictional Cost**, where  $Spread Return_t = Spread_{t-1} \Delta t - Duration_{t-1} (Spread_t - Spread_{t-1})$

- *Spread Return* reflects the earned credit spread as well as the change in market price due to spread movement.
- *Frictional Cost* reflects the effects of defaults, migrations, and otherwise forced rebalancing that occurs within the bond fund.

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# 6.3

## Appendix 3: Additional Detail on Simplified Model

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## Adjustments to spread parameters

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### Adjustments:

- Beta ( $\beta$ , mean reversion) set to 3% to ensure reasonable spread relationships between indices.
- Sigma ( $\sigma$ , volatility) adjusted to preserve steady state process variance:  $\sigma^2/(2\beta-\beta^2)$ .
- Tau ( $\tau$ , spread target) is adjusted to ensure the steady state mean aligns with the VM-20 target and accounts for the convexity in the log-OU process.

Unadjusted (Historical) Parameters					Adjusted Parameters				
	IG 1-5	IG 5-10	IG Long	HY		IG 1-5	IG 5-10	IG Long	HY
tau ( $\tau$ )	0.01069	0.01408	0.01627	0.04475	tau ( $\tau$ )	0.00920	0.01298	0.01493	0.04134
beta ( $\beta$ )	0.02927	0.03613	0.01951	0.03443	beta ( $\beta$ )	0.03000	0.03000	0.03000	0.03000
sigma ( $\sigma$ )	0.13394	0.10690	0.08231	0.10235	sigma ( $\sigma$ )	0.13557	0.09756	0.10181	0.09565
maturity	3.0	7.0	23.0	7.0	maturity	3.0	7.0	23.0	7.0
max_spread	0.06900	0.05900	0.05000	0.18329	max_spread	0.06900	0.05900	0.05000	0.18329
VM-20 target	0.01069	0.01408	0.01627	0.04475	VM-20 target	0.01069	0.01408	0.01627	0.04475

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## Principle Components Analysis (PCA) Analysis

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The PCA 1 (“Parallel”) factor accounts for 90% of historical variation across modeled indices.  
 → Use a single random variable for all four indices to ensure reasonable relationships between indices.

Eigenvector decomposition					Historical correlations between indices				
	PCA 1	PCA 2	PCA 3	PCA 4		IG 1-5	IG 5-10	IG Long	HY
IG 1-5	0.4924	0.6729	0.4257	-0.3515	IG 1-5	1.000			
IG 5-10	0.5192	0.1522	-0.1594	0.8258	IG 5-10	0.920	1.000		
IG Long	0.5007	-0.1262	-0.7382	-0.4340	IG Long	0.822	0.938	1.000	
HY	0.4871	-0.7128	0.4985	-0.0787	HY	0.797	0.871	0.836	1.000
Eigenvalue	3.5943	0.2093	0.1638	0.0325					
R <sup>2</sup>	89.9%	5.2%	4.1%	0.8%					

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### A simplified correlation matrix

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Correlations between spread and equity/interest rate drivers are based on the historical correlation of spread residuals.

- Correlations between the bond indices were derived using overlapping historical periods from 1/1999 to 12/2021.
- Correlations with equity and interest rate factors were derived based on all available data above.
- Correlations below 11% were set to 0% for brevity.
- Correlations between credit and other market factors were averaged and rounded to nearest 5% for simplicity.

Historical Correlation Matrix									
	CIR 1	CIR 2	CIR 3	SPX Var	SPX Ret	IG 1-5	IG 5-10	IG Long	HY
CIR 1	1.00								
CIR 2	0.00	1.00							
CIR 3	0.00	0.00	1.00						
SPX Var	0.00	0.00	0.00	1.00					
SPX Ret	0.00	0.00	0.00	-0.68	1.00				
IG 1-5	0.00	0.00	-0.18	0.52	-0.54	1.00			
IG 5-10	0.00	0.00	-0.27	0.59	-0.63	0.92	1.00		
IG Long	0.00	0.00	-0.30	0.57	-0.60	0.82	0.94	1.00	
HY	0.00	0.00	-0.32	0.62	-0.67	0.80	0.87	0.84	1.00



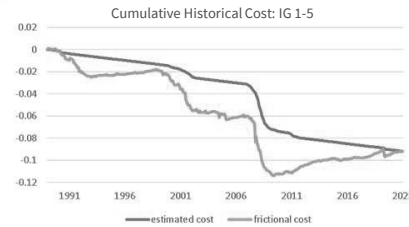
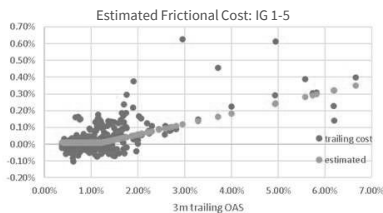
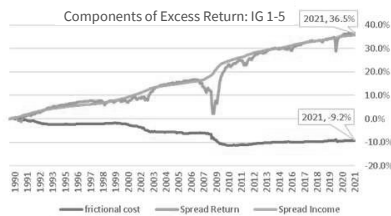
Simplified Correlation Matrix						
	CIR 1	CIR 2	CIR 3	SPX Var	SPX Ret	Spread
CIR 1	1.00					
CIR 2	0.00	1.00				
CIR 3	0.00	0.00	1.00			
SPX Var	0.00	0.00	0.00	1.00		
SPX Ret	0.00	0.00	0.00	-0.68	1.00	
Spread	0.00	0.00	-0.25	0.60	-0.60	1.00

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### Historical statistics: IG 1-5

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Frictional Cost Model Parameters: IG 1-5

	IG 1-5
min_cost ( $\alpha$ )	0.00010
kappa ( $\kappa$ )	0.01239
mult1 ( $m_1$ )	0.00000
mult2 ( $m_2$ )	0.06265

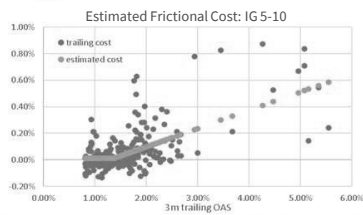
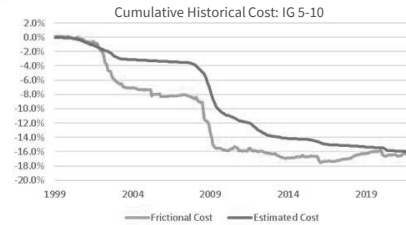
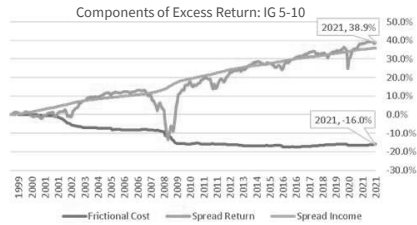
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### Historical statistics: IG 5-10

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Frictional Cost Model Parameters: IG 5-10

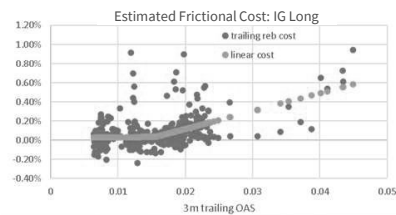
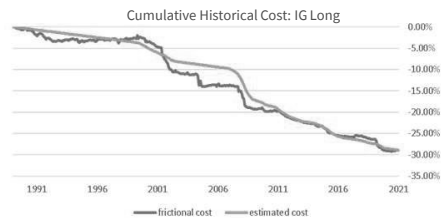
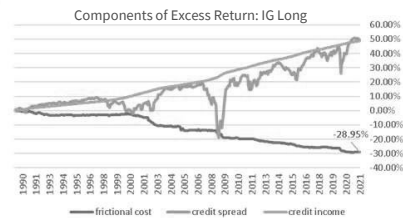
	IG 5-10
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.01362
mult1 ( $m_1$ )	0.00000
mult2 ( $m_2$ )	0.13773

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### Historical statistics: IG Long

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Frictional Cost Model Parameters: IG Long

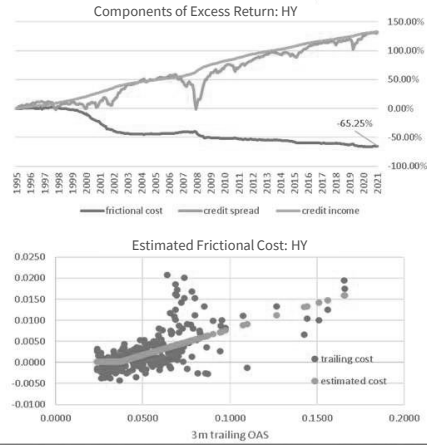
	IG Long
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.01556
mult1 ( $m_1$ )	0.00448
mult2 ( $m_2$ )	0.18706

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Historical statistics: HY

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Frictional Cost Model Parameters: HY

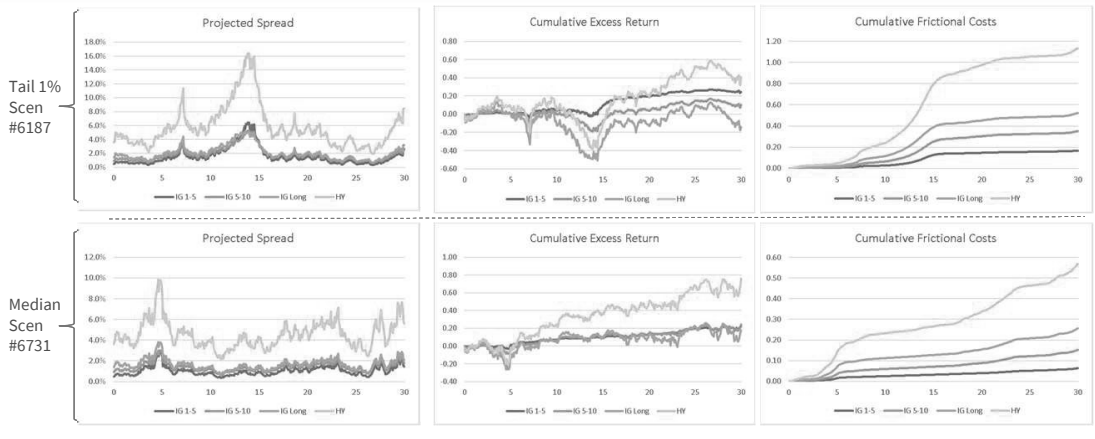
	HY
min_cost ( $a$ )	0.00010
kappa ( $\kappa$ )	0.03650
mult1 ( $m_1$ )	0.00100
mult2 ( $m_2$ )	0.12111

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Two sample scenarios: Tail 1% and Median

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Questions to the American Academy of Actuaries Economic Scenario Generator Work Group

1. On slide 13, where would bond fund returns solely based on the movement in treasury rates be reflected, in risk-free return, excess return (spread-based return), or somewhere else? For example, consider two years of returns on a bond index fund where the only difference in returns is due to a 100 bp increase in treasury rates in the second year. That is, credit spreads and frictional costs are the same in both years. The MV of the bond fund would be expected to drop in the second year due to the 100 bp rise. Would this drop in MV be reflected as a reduction in the risk-free return? But this does not make sense since the risk-free rate actually increased 100 bp. Do the returns on the bond index funds assume that bonds are held to maturity and therefore changes in MV due solely to movement in interest rates are not reflected in the returns? If bonds need to be sold before maturity, is any gain or loss due to interest rate movement reflected in the frictional cost?
2. On slide 14, I am trying to understand the purpose of the stylized fact that “credit spreads for bond funds held in the separate account should be consistent with economic assumptions for bonds held in the general account”. Is this saying that there should be consistency between how bonds are modeled in the GA and the SA? However, from slide 5, the stylized facts for credit spreads are independent of the model used. Why is this stylized fact under the category bond index fund returns when credit spreads, rather than index returns, are the subject of the stylized fact? Is the purpose of this stylized fact related to what is stated on slide 17, that SA bond fund return scenarios should be consistent with VM-20 prescribed spreads? So, is the stylized fact on slide 14 saying that the spread-based returns for bond funds in the SA should be consistent with the VM-20 prescribed spreads?
3. On bottom of slide 19, steady state targets, is not the comparison between Target OAS and Target Excess Return an apples-to-oranges comparison, since Excess Return is after defaults and the OAS is the average VM-20 ultimate spread which is before defaults?
4. What are the advantages and disadvantages of moving forward with the Academy’s Simplified Corporate Model instead of the Conning GEMS Corporate Model for use in determining statutory reserve and capital?
5. The AAA ESGWG’s stylized fact 6.b. states that “Credit spreads for bond funds held in the separate account should be consistent with economic assumptions for bonds held in the general account.”. When recommending consistency for the Simplified Corporate model, did the AAA ESGWG evaluate the VM-20 spread and default methodology for modeling individual bonds in the general account? If so, are there any assumptions or methodologies therein that could be improved or alternatives?
6. Is there any loss of conservatism in tail scenarios compared to the Conning GEMS Model (assuming similar targets) with the implicit modeling of defaults, recoveries, and credit migrations in the Academy’s Simplified Corporate Model?

## Interest Rates— Stylized Facts and Acceptance Criteria

Jason Kehrberg, MAAA, FSA  
Chairperson, Economic Scenario Generator Work Group (ESGWG)

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Member, Economic Scenario Generator Work Group (ESGWG)

National Association of Insurance Commissioners (NAIC) Life Actuarial (A) Task Force (LATF)  
December 11, 2022

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## Agenda—Interest rates

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1. Background
2. Stylized Facts
3. Acceptance Criteria
4. Discussion and Q&A

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# 1.

## Background

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## Background

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LATF asked the Academy to deliver a series of presentations focused on proposing qualitative **Stylized Facts** and quantitative **Acceptance Criteria** for the three major components of an ESG used for statutory reporting purposes: **Interest Rates**, **Equity Returns**, and **Corporate Bond Fund Returns**.

This presentation proposes **Stylized Facts** and **Acceptance Criteria** for Interest Rates that (a) are independent of any specific ESG model, (b) can be used to identify and evaluate candidate ESG models, and (c) can be used to evaluate a set of stochastic scenarios.

### Prior presentations in this series:

- A Framework for Working with ESGs (8/8/22)
- ESG Governance Considerations (8/8/22)
- Equity Returns—Stylized Facts (8/9/22)
- Corporate Credit & Bond Fund Returns—Stylized Facts, Acceptance Criteria, and a Simplified Model (10/27/22)

### This and future presentations in this series:

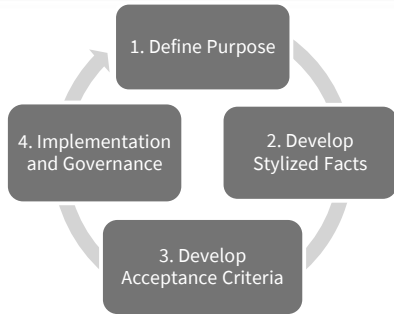
- **Interest Rates—Stylized Facts and Acceptance Criteria**
- Equity Returns—Acceptance Criteria

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## A framework for developing, implementing, and evaluating ESGs and the scenario sets they produce

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1. **Define Purpose:** The intended purpose of the ESG informs the economic variables to be simulated and the relative importance of their “stylized facts.”
2. **Develop Stylized Facts:** Stylized facts describe properties of the economic variables to be simulated. They are based on historical market data and economic theory and are prioritized relative to the defined purpose at hand. The establishment of stylized facts is critical for selecting candidate ESG models and a key prerequisite for the development of acceptance criteria.
3. **Develop Acceptance Criteria:** A set of quantitative metrics or target values at different time horizons or in different economic conditions that provide a simplified framework for ensuring sets of scenarios produced by the ESG are consistent with key stylized facts.
4. **Implementation and Governance:** ESG models are selected based on their ability to reflect the stylized facts, then calibrated in accordance with acceptance criteria. Validation reports are produced on each candidate scenario set generated by the ESG. These reports compare scenario set statistics to acceptance criteria and contain other charts and tables useful for evaluation and signoff, which is ultimately a matter of judgement (no automatic “pass” or “fail” based only on acceptance criteria). Implementation is an iterative process. It is important to periodically review and recalibrate the ESG as market conditions change over time.

*“Statistical criteria are important in assessing the quality of an ESG. Statistical calibration criteria are usually numerically specified but can also be qualitative in nature. Statistical criteria belong to one of two broad categories: qualitative features and quantitative measures. The issues one must address in both categories are not amenable to a checklist approach, however, and expert judgment plays a role.”*  
 (quote from p. 96 of the 2020 CAS/Conning research paper on ESGs)

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## Excerpts from the 2020 Casualty Actuarial Society (CAS)/Conning research paper on ESGs

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### High-level features of a good ESG:

- “It produces simulation results that reflect the economic view of the risk manager.
- Scenarios are consistent with **realistic market dynamics**.
- A large simulation should produce some **extreme but plausible results** (i.e., the simulation covers and moderately exceeds the benchmark stylized facts).
- Component models and architecture must have sufficient flexibility to serve in multiple roles.

If one discusses the essential features of a good ESG with a diverse group of ESG experts, those experts’ lists of features and the relative importance of those features will vary. However, they will set forth a common core of ideas that can serve as a checklist of best practices.”

### A good ESG:

1. “has a solid methodological foundation for the way the models are built and the way the variables are interrelated, and models are parsimonious, practical, and comprehensive.
2. provides a comprehensive suite of macroeconomic and financial variables and a multi-economy capability.
3. can accommodate many types of calibration views across a wide range of benchmarks.
4. produces simulation results that reflect a relevant view.
5. produces some extreme but plausible outcomes.
6. embeds realistic market dynamics.
7. is computationally efficient and numerically stable.
8. has fast and robust recalibration capabilities.
9. meets the requirements of regulators and auditing firms.
10. produces sufficient simulation detail for extensive validation.”

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The NAIC presented LATF with preliminary goals for interest rates on 12/3/20 and preliminary boundary guidance on 2/17/22 7

Preliminary goal	Preliminary boundary guidance
1. The model's starting yield curve should fit the actual starting yield curve as closely as possible. 2. The model should produce a variety of yield curve shapes, and they should change over time.	<i>Yield curve fit and Yield curve shape (priority 4)</i> a) Review initial actual vs. fitted spot curve differences for a sampling of 5 dates representing different shapes and rate levels for the entire curve and review fitted curves qualitatively to confirm they stylistically mimic the different actual yield curve shapes b) The frequency of different yield curve shapes in early durations should be reasonable considering the shape of the starting yield curve (e.g., a flatter yield curve leads to more inversions). c) The steady state curve has normal shape (not inverted for short maturities, longer vs shorter maturities, or between long maturities)
3. Interest rates can be negative.	<i>Negative rates (priority 3)</i> a) All maturities could experience negative interest rates b) Interest rates may remain negative for multi-year time periods c) Rates should generally not be lower than -1.5%

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The NAIC presented LATF with preliminary goals for interest rates on 12/3/20 and preliminary boundary guidance on 2/17/22 (continued) 8

Preliminary goal	Preliminary boundary guidance
4. The model should be capable of producing a reasonable range of results for very long simulations.	<i>High rates (priority 2)</i> a) The scenario set should reasonably reflect history, with some allowance for more extreme high and low interest rate environments b) Upper Bound: i. 20% is >= 99th percentile on the 3M yield fan chart, and no more than 5% of scenarios have 3M yields that go above 20% in the first 30 years ii. 20% is >= 99th percentile on the 10Y yield fan chart, and no more than 5% of scenarios have 10Y yields that go above 20% in the first 30 years
5. The ESG should be capable of producing low interest rates for an extended period of time.	<i>Low for long (priority 1)</i> a) For scenarios generated as of 12/31/20, at least <b>10%</b> of scenarios should have a <b>10-year</b> geometric average of the 20-year US Treasury yield that is below its current level (e.g., 1.45% at 12/31/20) b) For scenarios generated as of 12/31/20, at least <b>5%</b> of scenarios should have a <b>30-year</b> geometric average of the 20-year US Treasury yield that is below its current level (e.g., 1.45% at 12/31/20)

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**The NAIC presented LATF with preliminary goals for interest rates on 12/3/20 and preliminary boundary guidance on 2/17/22 (continued) 9**

Preliminary goal	Preliminary boundary guidance
6. The model should produce interest rate levels that fluctuate significantly over long periods.	<i>Volatility (no priority given)</i> Preliminary boundary guidance not specified
7. The interest rate generator should be arbitrage free.	<i>Arbitrage free (priority 3)</i> No longer considered an explicit requirement in the 2/17/22 preliminary boundary guidance since the NAIC's ESG Drafting Group was proposing the use of a generalized fractional floor.
8. The ESG should be calibrated using an appropriate historical period.	<i>Historical calibration period (no priority given)</i> Preliminary boundary guidance not specified

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# 2.

## Stylized Facts

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## Groupings for stylized facts about interest rates

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Stylized Facts have been grouped into the following three categories:

1. Level of Interest Rates
2. Volatility of Interest Rates
3. Term Structure of Interest Rates (shape of yield curve)

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### *Stylized Facts*

#### **1. Level of Interest Rates**

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The level of interest rates (the cost of borrowing money) changes due to a variety of complex and interrelated factors (e.g., supply of and demand for financing, business cycle, GDP, inflation, central bank actions to stimulate the economy or control inflation).

- a. Short-term rates (which the Fed has more control of) have generally fallen within a range of 0% to 20% and have most often been within the lower part of that range. Long-term rates have generally been within 300 bps of short-term rates.
- b. Negative interest rates are possible (have been observed outside the U.S.) but unlikely due to structural and market differences between the U.S. and other economies.
- c. Interest rates can exhibit multi-year trends (e.g., up, down, low-for-long). Interest rates can stay at very low levels for several years. Short-term rates can stay very near their lower bound for several years while higher long-term rates continue to fluctuate.

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*Stylized Facts*

**2. Volatility of Interest Rates**

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The volatility of interest rates varies over time, with periods of both high and low volatility.

- a. Monthly changes in interest rates are generally limited in size (less than 80 bps) but changes tend to be greater when the level of interest rates is higher.
- b. Monthly changes in short-term rates tend to be larger than monthly changes in long-term rates when short-term rates are not near their lower bound, but the opposite relationship tends to hold when short-term rates are near their lower bound.
- c. Volatility tends to increase in stressed markets.

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*Stylized Facts*

**3. Term Structure of Interest Rates (shape of yield curve)**

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The yield curve embodies the term structure of interest rates and takes a variety of shapes.

- a. The normal yield curve shape is upward sloping (long-term rates greater than short-term rates) and concave downward. Normal yield curve shapes can persist for extended periods of time.
- b. Non-normal yield curve shapes include inversions (downward sloping), humps, and valleys. Inversions (and other non-normal yield curve shapes) are often associated with key points in the business cycle (e.g., recession indicator) but generally don't persist for extended periods of time.
- c. The slope of the yield curve tends to be lower (even negative/inverted) when short-term rates are at relatively high levels.

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# 3.

## Acceptance Criteria

Unless otherwise specified, tables and charts on the following slides are based on two primary data sources:

1. Historical U.S. Treasury yields from the "Historical Curves" tab of the August 2022 Academy Interest Rate Generator (AIRG) located at <https://soa.org/resources/tables-calcs-tools/research-scenario/>
2. Simulated U.S. Treasury yields from "10000\_Path\_Set\_1a\_Conning\_GFF\_Baseline\_Equity\_123121" located at <https://naic.conning.com/scenariofiles>

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## This section discusses acceptance criteria around four key properties of interest rates identified in the stylized facts 16

### 1. Rate level

- Includes criteria around high, low, and negative rates.
- Only **steady state** criteria is being proposed at this point. **Interim** rate level criteria, which depend heavily on initial conditions, are being developed and will be proposed later.

### 2. Rate volatility

- Criteria varies by rate level (applies to interim and steady state).

### 3. Yield curve shape

- Criteria varies by rate level (applies to interim and steady state).

### 4. Low-for-long

- Although the ESGWG has not finalized its proposal for this key property of interest rates, we present our qualitative understanding of low-for-long for discussion and feedback.

Acceptance criteria provide a simplified framework for validating key scenario properties but are only part of a larger validation exercise that includes other charts, statistics, and of course, judgment.

Criteria were developed with the following principles in mind:

- The scenario set should include some extreme but plausible scenarios.
- Pathwise behavior is as important as point-in-time distributions.
- Scenarios should be consistent with realistic market dynamics over both short- and long-term horizons.

*"The importance of pathwise model behavior is that it is the simulated path that represents the way an insurance company will experience the evolution of the economy. In other words. The pathwise behavior is the only thing of interest when we want to investigate simulation dynamics. If the overall distribution of returns for an asset class is correct but the pathwise behavior does not correspond to the nature of the fluctuations that we see in the historical record, then there is a potential model issue." (p. 107)*

*"A good ESG will be capable of being calibrated to coherent targets across multiple simulation horizons." (p. 106)*

*(quotes from the 2020 CAS/Conning research paper on ESGs)*

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**Rate level**

**Historical PEWs (see appendix for additional information on PEWs)**

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- Selected 15-year half-life “Percentiles Exponentially Weighted” (PEWs) on historical month-end interest rates are proposed as steady state acceptance criteria for rate level (high, low, and negative).
  - Ideally, corresponding percentiles on scenario sets are “plausibly more extreme” than the PEWs.
- Calculated using data from April 1953, but unlike typical percentiles where data is weighted equally, PEWs give exponentially less weight to older data.
- PEWs are defined by their “half-life.” A half-life of 15 years means data that is 15 years older receives half the weight.
- A half-life of 15 years is suggested to give more weight to recent data while not overreacting to short-term fluctuations.

15-year half-life PEWs at 12/31/21	20Y	1Y
Max	15.52%	16.97%
99 <sup>th</sup> PEW	13.55%	13.86%
95 <sup>th</sup> PEW	9.35%	9.02%
85 <sup>th</sup> PEW	7.54%	6.22%
70 <sup>th</sup> PEW	5.77%	4.88%
60 <sup>th</sup> PEW	4.88%	3.34%
50 <sup>th</sup> PEW	4.33%	2.11%
40 <sup>th</sup> PEW	3.35%	1.31%
30 <sup>th</sup> PEW	2.83%	0.49%
15 <sup>th</sup> PEW	2.31%	0.16%
5 <sup>th</sup> PEW	1.78%	0.10%
1 <sup>st</sup> PEW	1.15%	0.07%
Min	0.98%	0.05%

*“Stability versus responsiveness: As a common trade-off and concern in general actuarial work, it is important to consider where the happy medium is between a long period of data (enhancing stability) and a recent shorter data period (that promotes responsiveness to more recent conditions).”*  
*(quote from p. 129 of the 2020 CAS/Conning research paper on ESGs)*

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**Rate level**

**Criteria for the distribution of steady state interest rates**

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	20Y Criteria	1Y Criteria	“Buffers” could provide guidance on “too extreme”
Max	> 15.52%	> 16.97%	[300 bps]
99 <sup>th</sup> Percentile	> 13.55%	> 13.86%	[275 bps]
95 <sup>th</sup> Percentile	> 9.35%	> 9.02%	[250 bps]
85 <sup>th</sup> Percentile	> 7.54%	> 6.22%	[225 bps]
70 <sup>th</sup> Percentile	> 5.77%	> 4.88%	[200 bps]
50 <sup>th</sup> Percentile	> 3.35% and < 4.88%	> 1.31% and < 3.34%	n/a
30 <sup>th</sup> Percentile	< 2.83%	< 0.49%	[60 bps]
15 <sup>th</sup> Percentile	< 2.31%	< 0.16%	[70 bps]
5 <sup>th</sup> Percentile	< 1.78%	< 0.10%	[80 bps]
1 <sup>st</sup> Percentile	< 1.15%	< 0.07%	[90 bps]
Min	< 0.98%	< 0.05%	[100 bps]

- Criteria is based on 15-year half-life PEWs.
  - Scenarios should be “plausibly more extreme” than the PEWs.
  - But scenarios that exceed the PEWs by more than a “buffer” may be “too extreme”.
- Test statistics:
  - Percentiles of the [20Y] and [1Y] rate distributions at month [600] (year [50]).
  - Max and Min of the [20Y] and [1Y] rate distributions are from projection months [480] through [720] (years [40] through [60]).
- Note, the range for the 50<sup>th</sup> percentile (Median) is based on the 40<sup>th</sup> and 60<sup>th</sup> PEW.

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**Rate level**  
**Illustrative application of criteria to field test scenario set #1a**

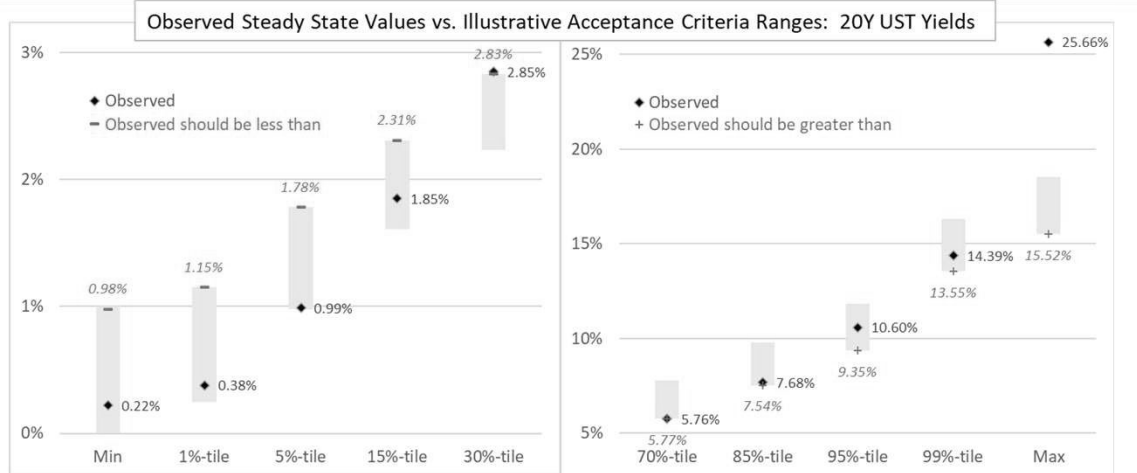
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	20Y Criteria	1Y Criteria	Buffers	20Y Stat	20Y Result	1Y Stat	1Y Result
Max	> 15.52%	> 16.97%	[300 bps]	25.66%	> Buffer (714 bps)	29.60%	> Buffer (963 bps)
99 <sup>th</sup> Percentile	> 13.55%	> 13.86%	[275 bps]	14.39%	In range	15.40%	In range
95 <sup>th</sup> Percentile	> 9.35%	> 9.02%	[250 bps]	10.60%	In range	11.09%	In range
85 <sup>th</sup> Percentile	> 7.54%	> 6.22%	[225 bps]	7.68%	In range	7.41%	In range
70 <sup>th</sup> Percentile	> 5.77%	> 4.88%	[200 bps]	5.76%	< PEW (1 bp)	4.71%	< PEW (17 bps)
50 <sup>th</sup> Percentile	> 3.35% and < 4.88%	> 1.31% and < 3.34%	n/a	4.20%	In range	2.35%	In range
30 <sup>th</sup> Percentile	< 2.83%	< 0.49%	[60 bps]	2.85%	> PEW (2 bps)	0.40%	In range
15 <sup>th</sup> Percentile	< 2.31%	< 0.16%	[70 bps]	1.85%	In range	0.07%	In range
5 <sup>th</sup> Percentile	< 1.78%	< 0.10%	[80 bps]	0.99%	In range	-0.26%	In range
1 <sup>st</sup> Percentile	< 1.15%	< 0.07%	[90 bps]	0.38%	In range	-0.53%	In range
Min	< 0.98%	< 0.05%	[100 bps]	0.22%	In range	-0.79%	In range

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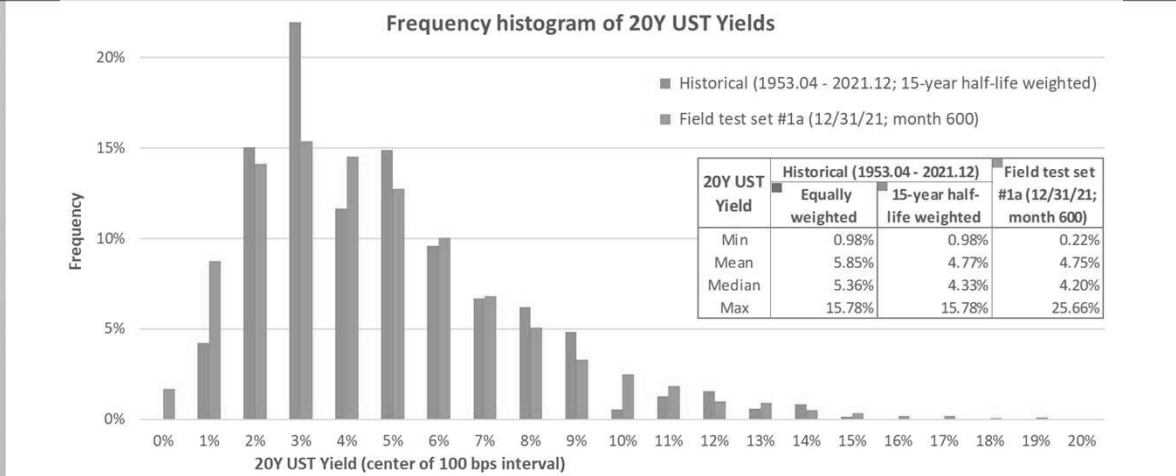
**Rate level**  
**Illustrative application of criteria to field test scenario set #1a (continued)** 20



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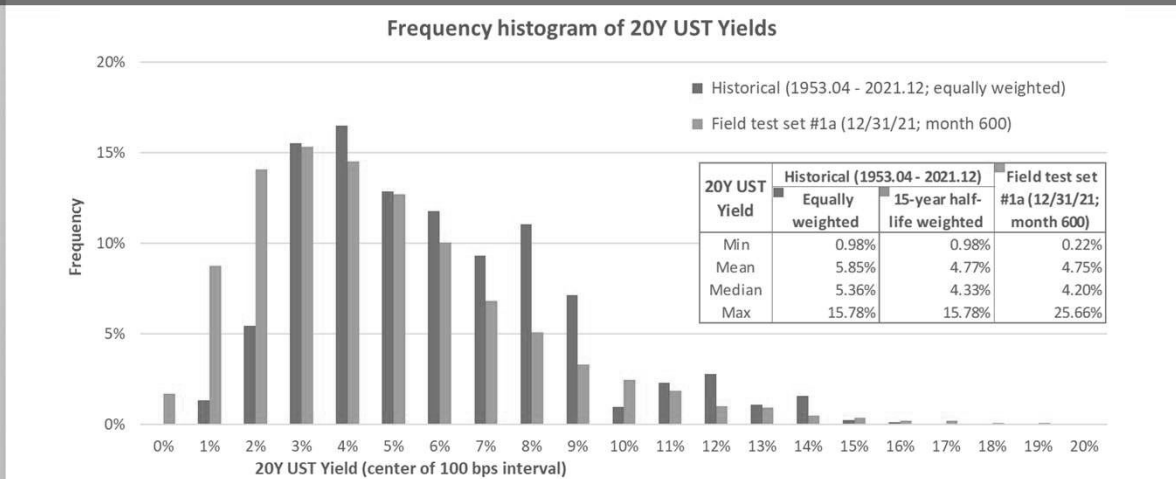
**Rate level**  
 Supplemental chart for evaluating rate levels on consistent basis with PEWs 21



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**Rate level**  
 Supplemental chart for evaluating rate levels on consistent basis with PEWs 22

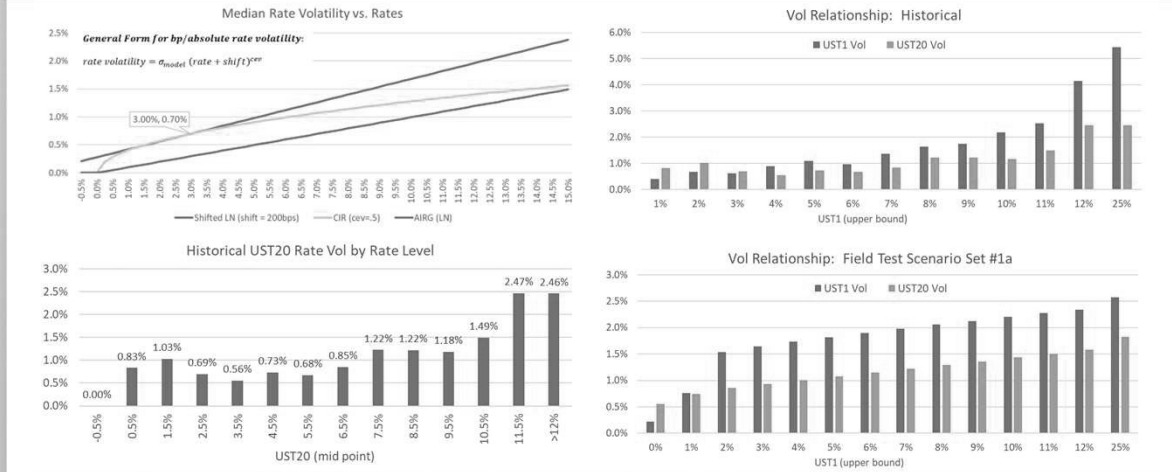


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## Rate volatility Background

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## Rate volatility Historical statistics and Criteria

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### Historical volatility statistics

Annualized standard deviation of monthly yield changes from 1953.04 to 2021.12, bucketed by yield level at beginning of month (BOM):

Bucket	Yield Level (BOM)	1Y	20Y
Low	[ ≤ 3% ]	0.59%	0.61%
Medium	[ > 3%, ≤ 8% ]	1.16%	0.74%
High	[ > 8% ]	3.32%	1.54%

Note that short (1Y) rate volatility tends to exceed long (20Y) rate volatility, except when rates are low.

### Volatility criteria

- » For the relevant test statistics on the candidate scenario set, calculate the annualized standard deviation of monthly yield changes across all scenarios, bucketed by the rate level at the BOM.
  - Calculate the above statistics for both the first [10] years and steady state, e.g., years [40] to [60].
- » The above test statistics should be “reasonably close” to the historical volatility statistics in the table to the left.
  - For example, the above test statistics should be within [X]% of historical volatility statistics.

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**Rate volatility**  
 Illustrative application of rate volatility criteria to field test scenario set #1a 25

Tabular comparison of annualized standard deviation of 1Y and 20Y UST rates to history

	Bucket	Yield Level (BOM)	History	First [10] years		Steady state*	
				Simulated	Difference	Simulated	Difference
<b>1Y UST</b>	Low	[ ≤ 3% ]	0.59%	1.06%	47 bps above	1.05%	46 bps above
	Medium	[ > 3%, ≤ 8% ]	1.16%	1.88%	72 bps above	1.85%	69 bps above
	High	[ > 8% ]	3.32%	2.31%	101 bps below	2.31%	101 bps below
<b>20Y UST</b>	Low	[ ≤ 3% ]	0.61%	0.66%	5 bps above	0.68%	7 bps above
	Medium	[ > 3%, ≤ 8% ]	0.74%	1.00%	26 bps above	1.11%	37 bps above
	High	[ > 8% ]	1.54%	1.61%	7 bps above	1.69%	15 bps above

\* Years [40] to [60]

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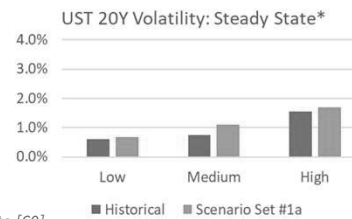
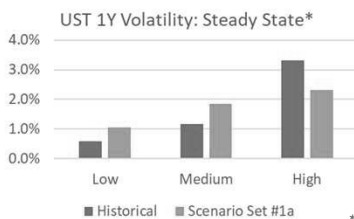
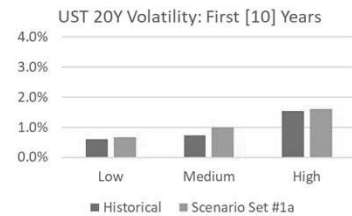
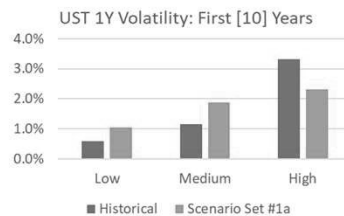


**Rate volatility**  
 Illustrative application of rate volatility criteria to field test scenario set #1a 26

Graphical comparison of annualized standard deviation of 1Y and 20Y UST rates to history

Observations on Set #1a:

- Initial and steady state volatility are similar
- Volatility is generally higher than history
- In the Low bucket:
  - 1Y volatility roughly double history
  - 20Y volatility roughly equal to history



\*Years [40] to [60]

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**Yield curve slope  
Historical statistics**

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**Historical yield curve slope statistics**

Selected percentiles on the distribution of slope (month-end [20Y] less month-end [1Y] yields) from 1953.04 to 2021.12, bucketed by [20Y] rate:

Bucket	Yield Level (BOM)	% Inverted	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	[ ≤ 3% ]	0%	0.0%	0.3%	<b>0.5%</b>	1.1%	1.6%	2.0%	<b>2.3%</b>	2.6%	2.9%
Medium	[ > 3%, ≤ 8% ]	17%	-1.4%	-0.5%	<b>-0.1%</b>	0.4%	0.9%	1.8%	<b>3.3%</b>	3.8%	4.3%
High	[ > 8% ]	25%	-3.4%	-1.5%	<b>-0.8%</b>	0.3%	1.2%	1.8%	<b>2.1%</b>	2.7%	3.9%

**Criteria**

- For the test statistics on the candidate scenario set, calculate selected percentiles on the distribution of slope ([20Y] less [1Y] yield) across all scenarios, bucketed by the level of the [20Y] yield level.
  - Calculate above for both the first [10] years and steady state, e.g., years [40] to [60].
- The [15<sup>th</sup>] and [85<sup>th</sup>] percentiles should be “plausibly more extreme” than history.

Historical data indicates the distribution of curve shapes (particularly inversions) varies by rate level.

**Yield curve slope  
Illustrative application of criteria to field test scenario set #1a**

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**Historical**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	0%	0.0%	0.3%	<b>0.5%</b>	1.1%	1.6%	2.0%	<b>2.3%</b>	2.6%	2.9%
Medium	17%	-1.4%	-0.5%	<b>-0.1%</b>	0.4%	0.9%	1.8%	<b>3.3%</b>	3.8%	4.3%
High	25%	-3.4%	-1.5%	<b>-0.8%</b>	0.3%	1.2%	1.8%	<b>2.1%</b>	2.7%	3.9%

**Field test #1a (first [10] years)**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	6%	-4.5%	-0.2%	<b>0.6%</b>	1.0%	1.3%	1.6%	<b>1.9%</b>	2.2%	3.1%
Medium	35%	-9.2%	-2.6%	<b>-1.3%</b>	-0.3%	0.7%	1.5%	<b>2.3%</b>	3.0%	4.5%
High	62%	-10.0%	-5.2%	<b>-3.4%</b>	-2.0%	-0.7%	0.5%	<b>1.3%</b>	2.2%	3.7%

**Difference (field test #1a less historical)**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	6%	-4.6%	-0.5%	<b>0.1%</b>	-0.2%	-0.3%	-0.5%	<b>-0.4%</b>	-0.4%	0.2%
Medium	18%	-7.9%	-2.1%	<b>-1.2%</b>	-0.6%	-0.3%	-0.3%	<b>-1.0%</b>	-0.8%	0.3%
High	37%	-6.7%	-3.7%	<b>-2.5%</b>	-2.3%	-1.9%	-1.3%	<b>-0.8%</b>	-0.5%	-0.2%

**Notes:**

- Slope = [20Y] less [1Y] yield
- Bucketed by [20Y] yield
- Buckets:
  - Low [ ≤ 3% ]
  - Medium [ > 3%, ≤ 8% ]
  - High [ > 8% ]
- The [15<sup>th</sup>] percentile is more extreme than history if the difference is negative.
- The [85<sup>th</sup>] percentile is more extreme than history if the difference is positive.

**Yield curve slope**

**Illustrative application of criteria to field test scenario set #1a**

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**Historical**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	0%	0.0%	0.3%	<b>0.5%</b>	1.1%	1.6%	2.0%	<b>2.3%</b>	2.6%	2.9%
Medium	17%	-1.4%	-0.5%	<b>-0.1%</b>	0.4%	0.9%	1.8%	<b>3.3%</b>	3.8%	4.3%
High	25%	-3.4%	-1.5%	<b>-0.8%</b>	0.3%	1.2%	1.8%	<b>2.1%</b>	2.7%	3.9%

**Field test #1a (steady state, e.g., years [40] to [60])**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	4%	-4.5%	0.3%	<b>0.9%</b>	1.2%	1.6%	2.0%	<b>2.3%</b>	2.6%	3.1%
Medium	19%	-10.5%	-2.0%	<b>-0.4%</b>	0.7%	1.7%	2.5%	<b>3.1%</b>	3.5%	4.6%
High	39%	-11.3%	-3.6%	<b>-1.8%</b>	-0.5%	0.6%	1.5%	<b>2.2%</b>	2.8%	4.2%

**Difference (field test #1a less historical)**

Bucket	Inv %	Min	5%	15%	30%	Median	70%	85%	95%	Max
Low	4%	-4.5%	0.0%	<b>0.4%</b>	0.1%	0.0%	0.0%	<b>0.0%</b>	0.0%	0.2%
Medium	2%	-9.2%	-1.5%	<b>-0.3%</b>	0.4%	0.8%	0.8%	<b>-0.2%</b>	-0.3%	0.4%
High	14%	-8.0%	-2.0%	<b>-1.0%</b>	-0.8%	-0.6%	-0.3%	<b>0.1%</b>	0.1%	0.3%

**Notes:**

- Slope = [20Y] less [1Y] yield
- Bucketed by [20Y] yield
- Buckets:
  - Low [ ≤ 3% ]
  - Medium [ > 3%, ≤ 8% ]
  - High [ > 8% ]
- The [15<sup>th</sup>] percentile is more extreme than history if the difference is negative.
- The [85<sup>th</sup>] percentile is more extreme than history if the difference is positive.

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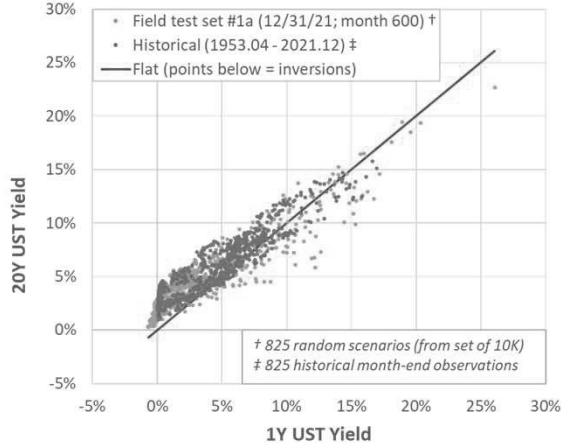


**Yield curve slope**

**Supplemental chart for evaluating rate yield curve slope**

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**Scatter Plot of 1Y vs 20Y UST Yields**



**Statistics**

**Historical (1953.04 - 2021.12)**

- Min spread = -336 bps
- Mean spread = 122 bps
- Max spread = 425 bps
- StDev spread = 132 bps
- Inversion freq. = 16%
- Mean inversion = -63 bps

**Field test set #1a (12/31/21; month 600) \***

- Min spread = -926 bps
- Mean spread = 129 bps
- Max spread = 448 bps
- StDev spread = 159 bps
- Inversion freq. = 17%
- Mean inversion = -146 bps

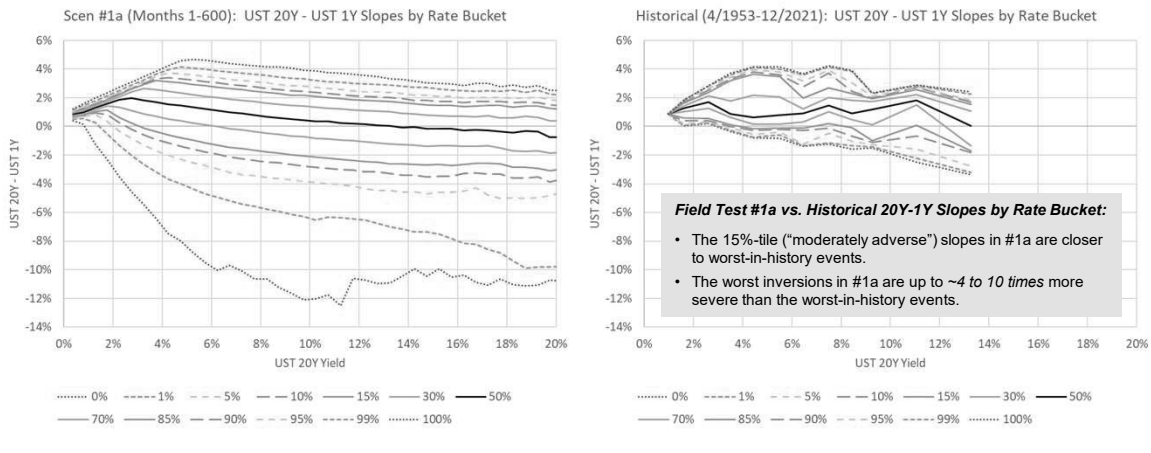
\* Stats based on all 10K scenarios

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**Yield curve slope**  
 Supplemental chart for evaluating rate yield curve slope

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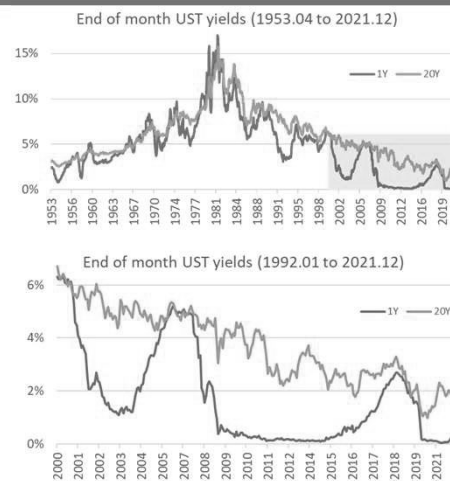
**4. Low-for-long**  
 Qualitative understanding

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Although the ESGWG has not finalized its proposal for this key property of interest rates, we present our qualitative understanding of low-for-long for discussion and feedback.

Historical observations on low-for-long interest rate behavior:

1. (a) The long rate [20Y] stays below a threshold [3%] for an extended period of time [5+ years]. (b) During this time, the long rate continues to fluctuate as usual.
2. (a) The short rate [1Y] is "stuck" in a very narrow range [50bps] above zero. (b) During this time, short rate volatility (which normally exceeds long rate volatility) drops to near zero.
3. Low-for-long is a relatively recent phenomenon (post-2000 in the US; limited historical data).



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# 4.

## Discussion and Q&A

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## Thank You

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### Contact:

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# Appendix

## **PEWs**

### **Additional information on Percentiles Exponentially Weighted (PEWs)**

The development of historical statistics for economic variables such as interest rates and equity rates involves subjective decisions such as how much history to include. One way to make use of all available data, but to focus more heavily on more recent data, is to develop exponentially weighted averages and percentiles.

An AWE is an Average Weighted Exponentially, with parameter Alpha. The most recent historical period, typically a month, gets an initial weight of 100%. Each prior historical period gets  $(1-\alpha)$  times the weight of the next most recent period. Based on the number of historical periods of available data, the weights are then normalized so that their sum is 100%. The AWE is simply the weighted average of all the available or selected data. The “half-life” is then the period of time for which the cumulative weight reaches 50%.

PEWs apply the same concept to develop exponentially weighted percentiles. The historical values are unchanged, but their relative weight is dependent on when they occurred. Values are rank-ordered, with percentiles based on the sum of the relative weights up to the particular value. It may be desirable to assign percentiles at the center of each value’s weight range, especially if extreme values are important or statistical distributions will be fitted to the percentiles.

**PEWs**  
**Historical UST 20Y PEWs at different half-lives (12/31/2021)**

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	Equally Weighted	20Yr Half-Life	15Yr Half-Life	10Yr Half-Life	5Yr Half-Life
Maximum	15.52 %	15.52 %	15.52 %	15.52 %	15.52 %
99th PEW	13.92 %	13.63 %	13.55 %	12.49 %	8.11 %
95th PEW	11.70 %	10.44 %	9.35 %	8.59 %	5.78 %
85th PEW	8.48 %	7.94 %	7.54 %	6.47 %	4.47 %
70th PEW	7.09 %	6.20 %	5.77 %	4.87 %	3.08 %
50th PEW	5.36 %	4.64 %	4.33 %	3.31 %	2.66 %
30th PEW	4.06 %	3.05 %	2.83 %	2.63 %	2.20 %
15th PEW	2.95 %	2.47 %	2.31 %	2.08 %	1.85 %
5th PEW	2.31 %	1.85 %	1.78 %	1.45 %	1.23 %
1st PEW	1.43 %	1.18 %	1.15 %	1.05 %	1.05 %
Minimum	0.98 %	0.98 %	0.98 %	0.98 %	0.98 %
Max minus Min	14.54 %	14.54 %	14.54 %	14.54 %	14.54 %
99th minus 1st	12.48 %	12.45 %	12.40 %	11.44 %	7.06 %
95th minus 5th	9.39 %	8.59 %	7.57 %	7.14 %	4.55 %
85th minus 15th	5.53 %	5.47 %	5.23 %	4.39 %	2.62 %
70th minus 30th	3.03 %	3.15 %	2.94 %	2.24 %	0.88 %

\* Historical 20 year Treasury rates are from: 1) 1953.04 - 1977.01 - monthly average rates from Fed H15 monthly history report;  
 2) 1977.02 - 1993.09 - estimated month-end 20 year rates by averaging 10 year and 30 year; 3) 1993.10 - current: actual month end rates.

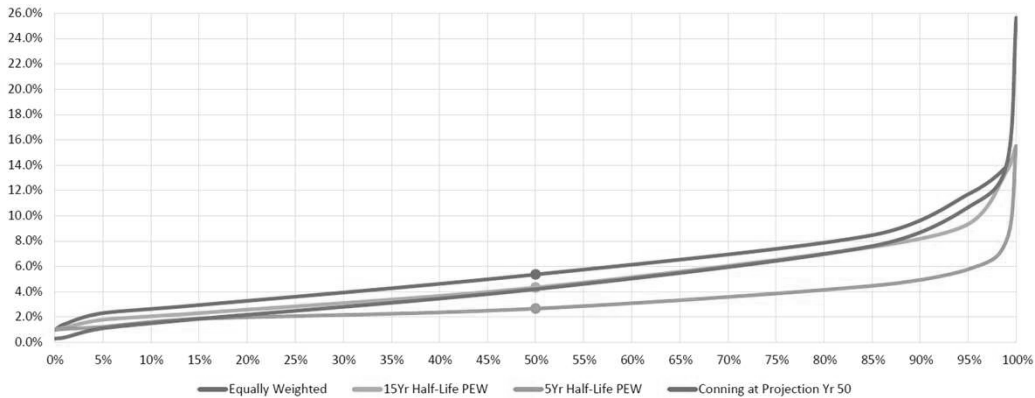
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**PEWs**  
**Chart of UST 20Y PEWs at different half-lives (12/31/2021)**

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**20Yr Treasury Cumulative Distribution Function**  
 1953.04 - 2021.12



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**PEWs**  
 Historical movement in 15-year half-life PEWs

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	PEWs from April 1953 through:						
	1971.12 (50 years ago)	1991.12 (30 years ago)	2001.12 (20 years ago)	2011.12 (10 years ago)	2016.12 (5 years ago)	2020.12 (1 year ago)	2021.12 Current
<b>Maximum</b>	7.34 %	15.52 %	15.52 %	15.52 %	15.52 %	15.52 %	15.52 %
<b>99th PEW</b>	7.24 %	14.32 %	14.03 %	13.88 %	13.63 %	13.55 %	13.55 %
<b>95th PEW</b>	6.85 %	13.28 %	12.48 %	11.45 %	10.64 %	10.04 %	9.35 %
<b>85th PEW</b>	6.18 %	11.19 %	9.18 %	8.34 %	8.01 %	7.60 %	7.54 %
<b>Mean (AWE)</b>	4.60 %	8.03 %	7.38 %	6.24 %	5.46 %	4.91 %	4.77 %
<b>50th PEW</b>	4.20 %	8.11 %	7.05 %	5.68 %	4.91 %	4.47 %	4.33 %
<b>15th PEW</b>	3.30 %	4.25 %	5.46 %	4.19 %	2.77 %	2.49 %	2.31 %
<b>5th PEW</b>	2.86 %	3.49 %	3.96 %	3.61 %	2.31 %	1.78 %	1.78 %
<b>1st PEW</b>	2.60 %	2.80 %	2.93 %	2.66 %	1.90 %	1.15 %	1.15 %
<b>Minimum</b>	2.57 %	2.57 %	2.57 %	2.57 %	1.78 %	0.98 %	0.98 %
<b>99th minus 1st</b>	4.64 %	11.52 %	11.10 %	11.22 %	11.73 %	12.40 %	12.40 %
<b>95th minus 5th</b>	3.99 %	9.79 %	8.52 %	7.84 %	8.33 %	8.26 %	7.57 %
<b>85th minus 15th</b>	2.88 %	6.94 %	3.72 %	4.15 %	5.24 %	5.11 %	5.23 %

\* Percentiles Exponentially Weighted (PEW) are determined by the specified alpha  
 \* Historical 20 year Treasury rates are from: 1) 1953.04 - 1977.01 - monthly average rates from Fed H15 monthly history report;  
 2) 1977.02 - 1993.09 - estimated month-end 20 year rates by averaging 10 year and 30 year; 3) 1993.10 - current: actual month end rates.

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**PEWs**  
 Chart of historical movement in 15-year half-life PEWs

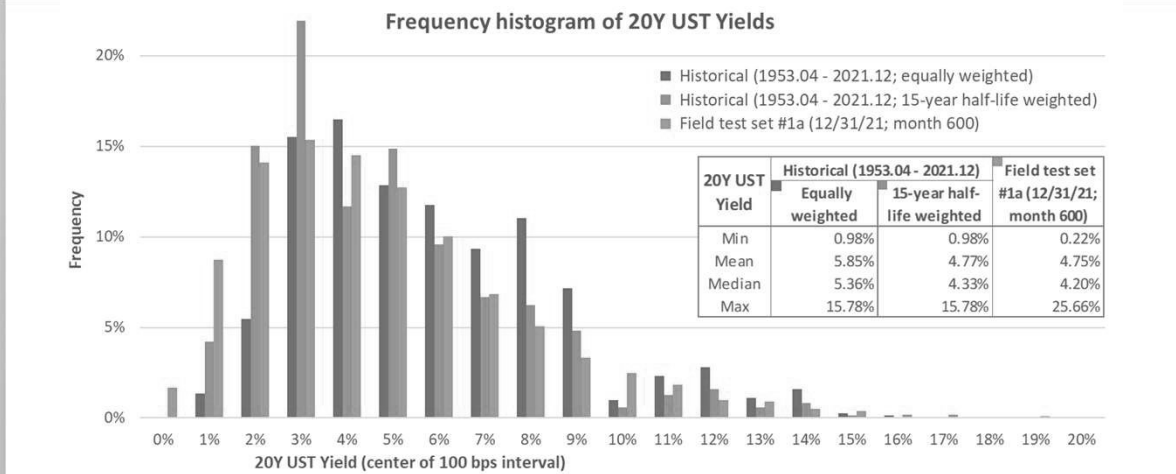
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**Rate level**  
 Supplemental chart for evaluating rate levels on consistent basis with PEWs 41



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**Yield curve slope (bucketed by 20Y rate)**  
 Historical Slope Data (4/1953 - 12/2020)

**Observations:**

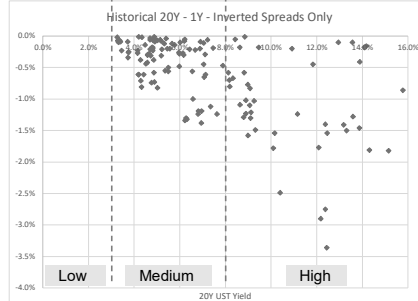
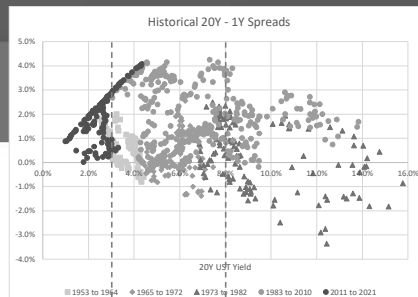
- No inversions for UST 20-year yields below 3%
- Severity of inversions generally increases with rate levels
- Other variations in curve steepness by rate level
- Recommend slope criteria based on simplified Low / Medium / High 20Y yield buckets to capture historical dynamics while not being overly constraining
- Also considers alignment with volatility buckets

**ALL Spreads**

Rate Bucket (20Y)	Inverted Months	Total Months	% Inverted	Min Spread	15%	50%	85%	Max Spread	Avg Spread
[0% - 1%]	0	1	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
[1% - 2%]	0	23	0%	0.0%	0.6%	1.3%	1.6%	1.8%	1.2%
[2% - 3%]	0	107	0%	0.2%	0.5%	1.7%	2.4%	2.9%	1.6%
[3% - 4%]	11	102	11%	-0.3%	0.1%	0.9%	3.2%	3.7%	1.4%
[4% - 5%]	32	146	22%	-0.8%	-0.2%	0.6%	3.6%	4.1%	1.2%
[5% - 6%]	18	89	20%	-0.8%	-0.1%	0.8%	3.5%	4.2%	1.3%
[6% - 7%]	18	93	19%	-1.4%	-0.1%	0.9%	2.0%	3.7%	0.9%
[7% - 8%]	10	82	12%	-1.2%	0.2%	1.5%	2.7%	4.3%	1.5%
[8% - 9%]	14	79	18%	-1.6%	-0.1%	0.9%	2.3%	3.9%	1.1%
[9% - 10%]	7	29	24%	-1.5%	-1.0%	1.2%	1.9%	2.3%	0.8%
> 10%	24	74	32%	-3.4%	-1.5%	1.4%	2.2%	2.9%	0.7%
All	134	825	16%	-3.4%	-0.1%	1.1%	2.7%	4.3%	1.2%

**INVERTED Spreads Only**

Rate Bucket (20Y)	Inverted Months	Total Months	% Inverted	Most Negative Spread	15%	50%	85%	Least Negative Spread	Avg Spread
[0% - 1%]	0	1	0%	n/a	n/a	n/a	n/a	n/a	n/a
[1% - 2%]	0	23	0%	n/a	n/a	n/a	n/a	n/a	n/a
[2% - 3%]	0	107	0%	n/a	n/a	n/a	n/a	n/a	n/a
[3% - 4%]	11	102	11%	-0.3%	-0.3%	-0.1%	-0.1%	0.0%	-0.1%
[4% - 5%]	32	146	22%	-0.8%	-0.6%	-0.3%	-0.1%	0.0%	-0.3%
[5% - 6%]	18	89	20%	-0.8%	-0.5%	-0.2%	-0.1%	0.0%	-0.3%
[6% - 7%]	18	93	19%	-1.4%	-1.3%	-0.4%	-0.1%	0.0%	-0.7%
[7% - 8%]	10	82	12%	-1.2%	-1.0%	-0.5%	-0.1%	-0.1%	-0.5%
[8% - 9%]	14	79	18%	-1.6%	-1.2%	-0.7%	-0.2%	0.0%	-0.8%
[9% - 10%]	7	29	24%	-1.5%	-1.3%	-1.1%	-0.8%	-0.2%	-1.0%
> 10%	24	74	32%	-3.4%	-2.2%	-1.4%	-0.2%	-0.1%	-1.4%
All	134	825	16%	-3.4%	-1.3%	-0.4%	-0.1%	0.0%	-0.6%



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## Yield curve slope (bucketed by 1Y rate) Historical Slope Data (4/1953 - 12/2020)

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**Observations:**

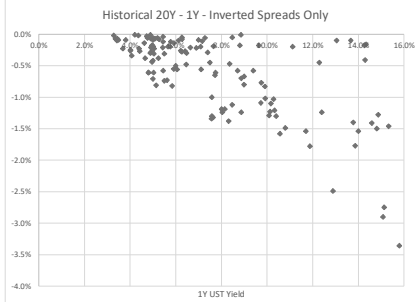
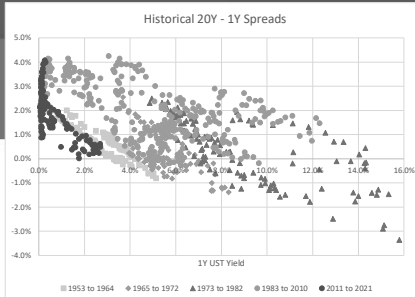
- No inversions for UST 1-year yields below 3%
- Severity of inversions generally increases with rate levels
- Other variations in curve steepness by rate level
- Recommend slope criteria based on simplified Low / Medium / High yield buckets to capture historical dynamics while not being overly constraining
- May bucket by 20Y instead of 1Y yields based on preference

**ALL Spreads**

Rate Bucket (1Y)	Inverted Months	Total Months	% Inverted	Min Spread	15%	50%	85%	Max Spread	Avg Spread
(0% 1%)	0	128	0%	0.5%	1.6%	2.5%	3.6%	4.1%	2.5%
(1% 2%)	0	69	0%	0.0%	1.0%	1.6%	3.6%	4.2%	2.1%
(2% 3%)	0	71	0%	0.3%	0.4%	0.9%	3.0%	3.6%	1.3%
(3% 4%)	8	103	8%	-0.2%	0.2%	0.8%	2.8%	4.3%	1.2%
(4% 5%)	22	89	25%	-0.6%	-0.2%	0.5%	1.7%	3.9%	0.8%
(5% 6%)	26	116	22%	-0.8%	-0.1%	0.9%	1.8%	3.0%	0.8%
(6% 7%)	12	76	16%	-0.6%	0.0%	1.2%	1.9%	2.5%	1.1%
(7% 8%)	14	56	25%	-1.3%	-0.3%	0.7%	1.9%	2.9%	0.8%
(8% 9%)	13	38	34%	-1.4%	-0.9%	0.5%	1.8%	2.8%	0.5%
(9% 10%)	7	26	27%	-1.1%	-0.7%	1.5%	2.1%	2.5%	0.9%
> 10%	32	53	60%	-3.4%	-1.6%	-0.4%	1.5%	2.0%	-0.3%
All	134	825	16%	-3.4%	-0.1%	1.1%	2.7%	4.3%	1.2%

**INVERTED Spreads Only**

Rate Bucket (1Y)	Inverted Months	Total Months	% Inverted	Most Negative Spread	15%	50%	85%	Least Negative Spread	Avg Spread
(0% 1%)	0	128	0%	n/a	n/a	n/a	n/a	n/a	n/a
(1% 2%)	0	69	0%	n/a	n/a	n/a	n/a	n/a	n/a
(2% 3%)	0	71	0%	n/a	n/a	n/a	n/a	n/a	n/a
(3% 4%)	8	103	8%	-0.2%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%
(4% 5%)	22	89	25%	-0.6%	-0.4%	-0.2%	0.0%	0.0%	-0.2%
(5% 6%)	26	116	22%	-0.8%	-0.7%	-0.2%	-0.1%	0.0%	-0.3%
(6% 7%)	12	76	16%	-0.6%	-0.5%	-0.3%	-0.1%	0.0%	-0.3%
(7% 8%)	14	56	25%	-1.3%	-1.3%	-0.5%	-0.1%	-0.1%	-0.6%
(8% 9%)	13	38	34%	-1.4%	-1.2%	-0.8%	-0.2%	0.0%	-0.8%
(9% 10%)	7	26	27%	-1.1%	-1.0%	-0.6%	-0.5%	-0.2%	-0.7%
> 10%	32	53	60%	-3.4%	-1.6%	-1.4%	-0.3%	-0.1%	-1.3%
All	134	825	16%	-3.4%	-1.3%	-0.4%	-0.1%	0.0%	-0.6%



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**MEMORANDUM**

TO: Life Actuarial (A) Task Force

FROM: Pat Allison, NAIC Staff

DATE: November 17, 2022

RE: Recommended replacement related to APF 2022-04 Swap Spreads and LIBOR transition to SOFR

---

**Background**

The purpose of this memo is to recommend: 1) LATF adoption of Secured Overnight Financing Rate (SOFR) swap spreads as the replacement for LIBOR swap spreads effective 12/30/22, which is the last business day coincident with or preceding 12/31/22 (which is a Saturday) so that prescribed spreads as of 12/31/22 (which equal those on 12/30/22) are based on the approach specified in this memo; 2) The approach to be used in calculating current and long-term swap spread curves as of 12/30/22; and 3) Technical implementation details as recommended by the American Academy of Actuaries. These recommendations are consistent with APF 2022-04 (which is effective for the 2023 *Valuation Manual*), which identifies the SOFR as the replacement for LIBOR, and the VM-20 Section 9.F.8.d Procedure for Setting Prescribed Gross Asset Spreads, cited below:

A current and long-term swap spread curve shall be prescribed for year one and years four and after, respectively, with yearly grading in between. The three-month and six-month points on the swap spread curves shall be the market-observable values for these tenors. Currently, this shall be the corresponding London Interbank Offered Rate (LIBOR) spreads over Treasuries. When the NAIC determines LIBOR is no longer effective, the NAIC shall recommend a replacement to the Life Actuarial (A) Task Force which shall be effective upon adoption by the Task Force.

The last sentence above notes that the NAIC shall recommend “a replacement”, which indicates an intent to replace the prescribed current and long-term swap spread curves with a single replacement, as opposed to continuing the NAIC’s prescription of LIBOR beyond the adoption date.

**Determination that LIBOR is no longer effective**

The Alternative Reference Rates Committee’s November 9 Meeting Readout highlighted continued progress in the transition from LIBOR to SOFR, with SOFR predominant across derivatives markets. Specifically, SOFR swaps have accounted for more than 90 percent of daily volumes on average of

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interest rate risk traded in the outright linear swaps market for the last two months while LIBOR swaps accounted for less than 4 percent of the overall volume in October. Based on this information, NAIC staff has determined that LIBOR is no longer effective.

Actuarial judgment may be required in the use of prescribed swap spreads (for example, in the case where companies have a combination of SOFR and LIBOR-based swaps). VM-20 Section 9.F.8.d states, in part “Interest rate swap spreads over Treasuries shall be prescribed by the NAIC for use throughout the cash-flow model *wherever appropriate* for transactions and operations...” (emphasis added).

### **Recommended Replacement for Current Benchmark Swap Spreads**

Effective December 30, 2022, NAIC staff recommends that for each month-end date, LIBOR swap spreads shall be replaced with SOFR swap spreads<sup>1</sup>:

- 3-month LIBOR spread should be replaced with 3m SOFR swap<sup>2</sup> spread
- 6-month LIBOR spread should be replaced with 6m SOFR swap spread
- 1-year swap spread should be replaced with 1yr SOFR swap spread
- ...
- 30-year swap spread should be replaced with 30yr SOFR swap spread

### **Recommended Replacement for Long-Term Benchmark Swap Spreads**

Effective December 30, 2022, NAIC staff recommends the following approach for the calculation of long-term benchmark swap spreads, consistent with APF 2022-04:

1. Extract daily swap spread data over the prescribed observation period (rolling 15-year period) ending on the last business day of the quarter from at least two reputable data sources. If the data source provides swap rates rather than swap spreads, convert the daily swap rate for each maturity to a swap spread by subtracting the corresponding maturity Treasury yield from the swap rate.
2. Calculate SOFR swap spreads as follows for the last business day “u” of 2022, where “u” is the 12/30/22 effective date of the adoption by the Life Actuarial (A) Task Force of SOFR swap spreads as the replacement for swap spreads previously prescribed:
  - a. For each maturity “m” = 0.25, 0.5, 1 ... 30 years, and business day “u”:  
$$\text{SOFR swap spread}(m,u) = \text{SOFR swap rate}(m,u) - \text{Treasury yield}(m,u).$$
3. Calculate SOFR swap spreads as follows for each business day before the 12/30/22 effective date of the adoption by the Life Actuarial (A) Task Force of SOFR swap spreads as the replacement for swap spreads previously prescribed, utilizing Bloomberg’s 2021-03-05 published USD Spread Adjustments:
  - a. For each maturity “m” = 3 or 6 months, and business day “u”,
    - i. 
$$\text{SOFR swap spread}(3 \text{ months},u) = \text{LIBOR swap spread}(3 \text{ months},u) - 0.26161\% \text{ (the USD 3-month Spread Adjustment)}$$

---

<sup>1</sup> During 2021 the swap market evolved such that the definition of a standard n-year interest rate swap changed in January 2022 to be a SOFR swap from the LIBOR swap.

<sup>2</sup> 3-month and 6-month SOFR swap rates are defined herein as the fixed rate one party pays at the end of three months or six months in exchange for receiving at such time 3-month SOFR or 6-month SOFR, calculated on a compounded in arrears basis.

- ii.  $\text{SOFR swap spread}(6 \text{ months}, u) = \text{LIBOR swap spread}(6 \text{ months}, u) - 0.42826\%$  (the USD 6-month Spread Adjustment)
  - b. For each maturity “m” = 1 ... 30 years, and business day “u”:  
 $\text{SOFR swap spread}(m, u) = \text{LIBOR swap spread}(m, u) - 0.26161\%$  (the USD 3-month Spread Adjustment)
4. Average the swap spread data from the data sources by maturity over the prescribed observation (rolling 15-year period).
5. Calculate the Long-Term Benchmark Swap Spreads as the 85% conditional mean for each of the 32 maturity categories (three-month, six-month, one-year, two-year, ... 30-year) using the same business trading days as were used in the 85% conditional mean for long-term bonds spreads.
6. Publish the Long-Term Benchmark Swap Spreads in a table. Among tables published on the NAIC website (See Subsection H), Table J shows Long-Term Benchmark Swap Spreads

In Table J, NAIC staff shall clarify that from 12/31/22 forward, prescribed current and long-term benchmark swap spreads are SOFR swap spreads. [Drafting Note: The tables will be labeled to indicate they contain SOFR swap spreads.

### Technical Implementation Details

NAIC staff recommends that implementation of prescribed current and long-term benchmark SOFR swap spreads be based on guidance included in a November 17, 2022 comment letter to LATF from the American Academy of Actuaries. The Academy letter provides technical details on the calculation of treasury par yield curve rates, as well as prescribed swap spread calculations and their publication. The letter outlines three alternative approaches to handle inconsistencies in the historical swap spreads. NAIC staff recommends alternative #2, which is recommended by the Academy in such comment letter. This would mean that for purposes of calculating long-term swap spreads, historical current swap spreads would be recalculated for December 31, 2021 through December 29, 2022, but only to remedy the inconsistency where spreads were a 50/50 blend of LIBOR swap spreads and SOFR swap spreads.



AMERICAN ACADEMY of ACTUARIES

*Objective. Independent. Effective.™*

November 17, 2022

Ms. Rachel Hemphill  
Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners (NAIC)

Re: Academy input on implementation on Treasury par yield curve rates and on prescribed swap spread calculations and their publication, for APF 2022-04 on swap spreads and London Inter-Bank Offered Rate (LIBOR) transition to Secured Overnight Financing Rate (SOFR) (the “APF”), and for the anticipated next version of a related memo (the “Memo”) from NAIC staff

Dear Ms. Hemphill,

The Life Reserves Work Group, Annuity Reserves and Capital Work Group, and Variable Annuity Reserves and Capital Work Group of the American Academy of Actuaries<sup>1</sup> (the “Academy”) appreciates the opportunity to provide guidance on this topic. The Academy is thankful to LATF and NAIC staff as well for the July 30 LATF adoption of the APF, the June 9 and May 26 exposures of earlier versions of the APF and of the Memo, as well as for additional communications throughout the calendar year.

The Academy has received an informal request from NAIC staff for input with regard to implementation of the APF and the Memo. More specifically, NAIC staff would like Academy input on what data source(s) and or methodology might be used, among numerous possibilities, to calculate Treasury rates that would be subtracted from SOFR swap rates (that the NAIC will obtain from other sources) on each business day to calculate prescribed swap spreads for SOFR swaps for the 32 maturities (3-month, 6-month, 1-year, 2-year, . . . , 29-year, 30-year) in VM-20. Given that this topic is quite technical, this letter also includes Academy input, which covers additional implementation details for the APF and the Memo beyond what is specified in the APF, on prescribed swap spread calculations and their publication by the NAIC.

<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

### **Academy input on Treasury yields to implement the APF:**

After reviewing several possibilities and receiving some preliminary input from NAIC staff, the Academy recommends the following approach:

1. Obtain Treasury par yield curve rates for 10 on-the-run (OTR) maturities (3m, 6m, 1y, 2y, 3y, 5y, 7y, 10y, 20y, 30y) from either:
  - a. [https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily\\_treasury\\_yield\\_curve&field\\_tdr\\_date\\_value=2022](https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_yield_curve&field_tdr_date_value=2022) ;  
or
  - b. <https://www.federalreserve.gov/releases/h15/> ; (note on this page the Treasury par yield curve rates are labeled as “Treasury constant maturities”)
  
2. Utilize the “monotone convex spline” (MC) method to calculate par yield curve rates for the 32 swap spread maturities prescribed in VM-20, as such method has been adopted by the U.S. Treasury starting December 6, 2021, either A) by using a spreadsheet (e.g., a historical saved version is available by copy/pasting the following into an internet browser:  
<http://web.archive.org/web/20180903055110/finmod.co.za/Monotone%20Convex%20Interpolation.xls>) created by Graeme West, who co-authored a paper titled “Methods for Constructing a Yield Curve” (as discussed below) or B) by using any mathematically equivalent approach:
  - a. Enter as percentages the par yield curve rates, for the 10 OTR maturities, into cells D1 to D10 of the “input” tab in the spreadsheet;
  - b. Click on the “Boot curve” button in the “input” tab in the spreadsheet; and
  - c. Extract from column B of the “curves” tab in the spreadsheet the Treasury par yield curve rates for the 32 maturities prescribed in VM-20 (which could be listed at the bottom of this tab via an Excel VLOOKUP formula or macro created by NAIC staff or the Academy).

### **Academy input on prescribed Current swap spread calculations and their publication:**

3. Convert SOFR swap rates obtained from each data source to a bond-equivalent semi-annual Actual/Actual basis as needed. To perform these calculations, please note the following market conventions that are used in the trading of such derivative instruments:
  - a. 3-month and 6-month SOFR swap rates are quoted by the Chicago Mercantile Exchange on a 3-month Actual/360 and a 6-month Actual/360 basis, respectively.
  - b. 1-year, 2-year, 3-year ... 29-year, 30-year SOFR swap rates are quoted on an annual Actual/360 basis.

4. Convert any LIBOR swap rates obtained from each data source to a bond-equivalent semi-annual Actual/Actual basis as needed. To perform these calculations, please note the following market conventions that are used in the trading of such derivative instruments:
  - a. 3-month and 6-month LIBOR are quoted on a quarterly Actual/360 and a semi-annual Actual/360 basis, respectively.
  - b. 1-year, 2-year, 3-year ... 29-year, 30-year LIBOR swap rates are quoted on a semi-annual 30/360 basis.
  
5. Calculate prescribed Current swap spreads for each of the 32 swap spread maturities prescribed in VM-20 on a bond-equivalent semi-annual Actual/Actual basis, after first calculating SOFR swap spreads from each data source as the SOFR swap rates from such data source, converted to a bond-equivalent semi-annual Actual/Actual basis as needed, minus the par Treasury yield curve rate of the same maturity (note this formula is consistent with the APF). If the NAIC also publishes LIBOR swap rates for as long as it has sufficient data from data sources to do so, these should be calculated on a bond-equivalent semi-annual Actual/Actual basis, after first calculating LIBOR swap spreads from each data source as the LIBOR swap rates from such data source, converted to a bond-equivalent semi-annual Actual/Actual basis as needed, minus the par Treasury yield curve rate of the same maturity.
  
6. Specify the following, in the NAIC spreadsheets where prescribed swap spreads are published, that starting with the effective date (that the Academy expects will be December 30, 2022, which is the last business day in 2022) specified in the Memo:
  - a. These 32 Current swap spreads prescribed in VM-20 are expressed on a bond-equivalent semi-annual Actual/Actual basis.
  - b. For each of the 32 swap spread maturities, the prescribed Current swap spread is calculated as the difference of:
    - i. the average SOFR swap rate obtained by the NAIC from data providers for such maturity, after each rate obtained is converted to a bond equivalent (semi-annual Actual/Actual) basis as needed, minus
    - ii. the Treasury par yield curve rate for such maturity, where such Treasury par yield curve rate is determined using the process described in the “Academy recommendation on Treasury yields” section of this letter.
  - c. If the NAIC also publishes LIBOR swap rates for as long as it has sufficient data from data sources to do so, then for each of the 32 Current swap spread maturities, the LIBOR swap spread is calculated as the difference of:
    - i. the average LIBOR swap rate obtained by the NAIC from data providers for such maturity, after each rate obtained is converted to a bond equivalent (semi-annual Actual/Actual) basis as needed, minus

- ii. the Treasury par yield curve rate for such maturity, where such Treasury par yield curve rate is determined using the process described in the “Academy recommendation on Treasury yields” section of this letter.
  - d. The purpose of specifying the above information is for a company that has one or more models that (i) require the input of swap spreads over Treasury rates that are expressed on a different payment frequency and/or day count basis (e.g., the market convention for each maturity), and/or (ii) calculate Treasury rates and/or swap rates, based on input for Treasury rates and prescribed swap spreads for some or all of the 32 prescribed swap spreads, in a different manner than described above (e.g., a different interpolation method, and/or a different method for calculating OTR constant maturity Treasury yield curve rates that might be implemented by an economic scenario generator that the company uses), so that the company can transform the prescribed swap spreads to be precisely equivalent for use in the company’s models. Given that the NAIC is still working on technical details for the interest rate model in the GEMS ESG, which potentially could result in (i) and/or (ii) above, the Academy offers the opportunity to address this topic at the appropriate time with the NAIC ESG Technical Drafting Group.
7. Also, we recommend stating the following in the NAIC spreadsheets where prescribed swap spreads are published: “Prior to the effective date specified in the Memo, prescribed Current spreads were calculated using a less precise methodology than that being used starting on that effective date, such that the older prescribed Current spreads could not be described as:
- a. being spreads over a Treasury curve calculated on a specific basis that could be replicated by third parties, or
  - b. as having for all 32 maturities a specific payment frequency or day count basis.”

Before NAIC implementation, if such is request, the Academy would be pleased to peer review any NAIC preliminary calculations and/or provide the NAIC with formulas to implement the above recommendations.

### **Academy input for prescribed Long term swap spread calculations**

The Academy has discussed the extent to which the Academy should recommend that starting on the effective date specified in the Memo, prescribed Long term swap spread calculations should involve NAIC recalculation of historical prescribed Current swap spreads to remedy inconsistencies discussed above. Below is a discussion of three alternatives for Long term swap spread calculations starting with the effective; the Academy views #2 as the most practical, as explained below.

- 1) Do not recalculate any historical Current swap spreads;



- 2) Recalculate historical Current swap spreads for December 31, 2021, through the business day preceding the effective date, but only to remedy that inconsistency where such spreads were a 50/50 blend of LIBOR swap spreads and SOFR swap spreads; or
- 3) Recalculate all historical swap spreads for the experience period (not longer than 15 years) to be used to calculate Long term swap spreads on the effective date, reflecting all of the modifications mentioned in this letter.

The Academy recommends that:

- Item #1 not be used because:
  - For 15 years starting with the effective date, about 1/15<sup>th</sup> of the prescribed Long term spread calculations (e.g., from 12/31/2021 to 12/30/2022) would involve use of Current swap spreads that deviated from VM-20.
- Item #2 is the most practical approach because:
  - It involves only a limited amount of extra work (e.g., following VM-20 to recalculate Current swap spreads from 12/31/2021 to 12/30/2022);
  - It does not involve the historical recalculation of Current swap spreads to reflect the above Academy input, starting with the effective date, on Treasury yields and Current swap spreads, and is this much easier for NAIC staff to implement than #3; and
  - Because, although #2 involves recalculation of about 1/15<sup>th</sup> of the historical prescribed Current swap spreads used in Long term swap spread calculations starting with the effective date, it is expected to result in a smoother transition than #3 (which involves recalculation of all of the historical prescribed Current swap spreads) in prescribed Long term swap spreads from the three month-end dates preceding the effective date.
- Item #3 not be used, even though it would be the most theoretically sound calculation prospectively, because
  - It involves more work for NAIC staff than #2; and
  - It is expected to result in a less smooth transition than #2 in prescribed Long term swap spreads from the three month-end dates preceding the effective date, which might cause an AAT, PBR or principles-based capital under RBC to result on the effective date for a company that is materially different from the qualified actuary's expectations.

### **Academy input on NAIC governance for prescribed swap spread calculations**

Given that the calculations above involve several steps and multiple sources, and the possibility that human error could occur at a data provider or at the NAIC, the Academy recommends that the NAIC implement a quality control process to be used to ensure that prescribed spreads that are calculated and published, starting with the effective date specified in the Memo (e.g., December 30, 2022) are consistent with the APF, the Memo, and this Academy letter. The Academy would be pleased to provide private comments directly to NAIC staff on their proposed quality control process.

### **Academy input on the Memo**

Please recall that on June 10, LATF exposed a June 9 draft of the Memo, which upon LATF adoption would implement the last sentence in Section 7.F.8.d, which reads: “When the NAIC determines LIBOR is no longer effective, the NAIC shall recommend a replacement to the Life Actuarial (A) Task Force which shall be effective upon adoption by the Task Force.” In coordination with NAIC staff, the Academy recommends that NAIC staff refine its earlier draft of the Memo to recommend LATF implementation of the Memo that is consistent with the above input in this Academy letter, ideally with an effective date of December 30, 2022, which is the last business day coincident with or preceding December 31, 2022 (which is a Saturday), so that prescribed spreads as of December 31, 2022 (which equal those on December 30, 2022) are based on the approach specified in the Memo and thus would be reflected in 2022 year-end reporting. In order to achieve such consistency, the Academy recommends that LATF expose for comment the next version of the Memo.

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The Academy appreciates the efforts of LATF and NAIC staff on the APF and Memo. If you have any questions or would like further dialogue on the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Alan Routhenstein, MAAA, FSA  
Member, Life Valuation Committee  
American Academy of Actuaries



AMERICAN ACADEMY of ACTUARIES

*Objective. Independent. Effective.™*

December 1, 2022

Ms. Rachel Hemphill  
Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners (NAIC)

Re: Academy comment letter on “NAIC staff memo to LATF recommending LIBOR is no longer effective for 111722 LATF exp.docx” (the “Memo”), which is titled “Recommended replacement related to APF 2022-04 Swap Spreads and LIBOR transition to SOFR,” and which was exposed for 14 days by LATF on November 17, 2022

Dear Ms. Hemphill,

Please note that definitions of acronyms used in this letter that are not defined elsewhere in this letter, are as follows:

- “APF” means “APF 2022-04 on Swap Spreads and LIBOR transition to SOFR,”
- “LIBOR” means “London Inter-Bank Offered Rate,” and
- “SOFR” means “Secured Overnight Financing Rate.”

The Life Reserves Work Group, Annuity Reserves and Capital Work Group, and Variable Annuity Reserves and Capital Work Group of the American Academy of Actuaries<sup>1</sup> (the “Academy”) appreciates the opportunity to provide guidance on this topic. The Academy is thankful to LATF and NAIC staff as well for the November 17 LATF exposure of the Memo and an Academy letter to LATF on this topic, the July 30 LATF adoption of the APF, the June 9 and May 26 exposures of earlier versions of the APF and of the Memo, as well as for additional communications throughout the calendar year.

The Academy supports the Memo, which incorporates previous Academy input, and encourages the Memo’s adoption by LATF at the NAIC Fall National Meeting.

<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

~ ~ ~

The Academy appreciates the efforts of LATF and NAIC staff on the APF and Memo. If you have any questions or would like further dialogue on the above topics, please contact Amanda Barry-Moilanen, life policy analyst, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

Sincerely,

Alan Routhenstein, MAAA, FSA  
Member, Life Valuation Committee  
American Academy of Actuaries



**Brian Bayerle**  
Senior Actuary

**Colin Masterson**  
Policy Analyst

November 30, 2022

Rachel Hemphill  
Acting Chair, NAIC Life Actuarial (A) Task Force

Re: LIBOR to SOFR Transition

Dear Ms. Hemphill:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit feedback on the exposed NAIC staff memo “Recommended replacement related to APF 2022-04 Swap Spreads and LIBOR transition to SOFR”.

ACLI does not have any notable objections to this exposure and its recommendations. However, we do have several requests as this effort moves forward.

First, ACLI members would request Table J (current LIBOR/SOFR blend) and the new SOFR-only versions as of 9/30/2022, 11/30/2022, and 12/31/2022 to perform impact analysis (i.e., before and after change tables). It would be helpful to have the revisions from past valuation dates as soon as possible to provide companies with maximum line of sight into expected impacts for year end and to allow adequate evaluation of any model changes necessary to anticipate correct spreads (e.g., removing adjustments to convert the blended spreads into SOFR-only spreads). If LATF moves forward with the Academy’s option #2 for determining the long-term spreads, for full transparency, it may be sensible to provide the recalculated current spreads for each impacted valuation date.

Second, ACLI would appreciate if the NAIC could clarify how current spreads are determined from at least two reputable data sources. Is it a straight average across the different sources or are they determined by another approach?

We look forward to future discussions on this topic and we would like to take this opportunity to thank regulators for their efforts on this project.


A handwritten signature in cursive script that reads 'Colin Masterson'. The signature is written in black ink and is positioned above the footer information.

American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI’s member companies are dedicated to protecting consumers’ financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI’s 280 member companies represent 94 percent of industry assets in the United States.

[acll.com](http://acll.com)

cc: Scott O’Neal, NAIC, Pat Allison, NAIC



**NAIC**  
**NATIONAL**  
**MEETING**  
**FALL 2022**  
**TAMPA**

**Update on Mortality  
Experience Data  
Collection**

**Pat Allison, FSA, MAAA**

December 11, 2022

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

**NAIC** NATIONAL MEETING **FALL 2022**

**Agenda**

- Update on 2021 Data Collection
- What's New In 2022?
- 2022 Data Collection Status
- 2022 Data Collection A/E Ratios
- Recommendation for Deadline Extension

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## Update on 2021 Data Collection

- 108 companies were selected for collection of mortality experience data for observation years 2018 and 2019.
- The NAIC processed 501 data submissions and over 456 million total data records (this includes companies that submitted multiple times).
- The final submissions represent approximately 92% of total in scope business. The NAIC is monitoring the percentage to ensure that at least 85% of industry claims are collected as required by VM-51 Section 2.C.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## Update on 2021 Data Collection

- NAIC calculated Actual to Expected ratios for each company's mortality. This information was sent out after the data collection was over. We asked companies to review their A/E's and let us know if they are in line with expectations.
  - 80 companies have responded that their ratios look reasonable
  - 5 companies have not responded. We have reached out to the Missouri Department of Insurance for assistance in obtaining a response.
  - NAIC is working with the remaining companies to investigate possible causes for unusual A/E ratios.

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## 2021 Data Collection A/E Ratios

- We have received questions regarding the methodology of the A/E calculation. This can be found in section 4.3 of this document:  
<https://www.soa.org/globalassets/assets/files/research/experience-study-calculations.pdf>.
- As a result of the A/E analysis, some companies identified corrections that needed to be made to their data.
  - In order to maximize the amount of usable data, we have been allowing companies to submit corrected data files for the 2018 and 2019 observation years.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## 2022 Mortality Experience Data Collection What's New in 2022?

- New Data File Layout
  - Additional field to accommodate reinsurer / third-party administrator reporting
- New Plan Codes (voluntary in 2022 – VM amendment takes effect in 2023)
  - New plan codes to identify paid-up additions and one year term purchased with dividends.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS



## 2022 Mortality Experience Data Collection What's New in 2022?

- New Cause of Termination (voluntary in 2022 – VM amendment takes effect in 2023)
  - Added a “Death due to Covid-19” option.
- Ability to Download Exceptions from RDC
  - Previously RDC exceptions were only available online within RDC

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## 2022 Mortality Experience Data Collection What's New in 2022?

- Data Dictionary
  - The data dictionary provides additional guidance and expectations for each field
- Rules-Based Validation Changes
  - Severity of some validations were modified (e.g. fields not involving mortality such as premium data were reclassified as low severity or warning only)

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## 2022 Data Collection Status

- The companies selected remained the same from 2021. However, one company requested an exclusion (premiums below \$10 million) and another merged with an affiliate. This leaves us with 106 companies.
- 93 companies have submitted their data for the 2020 observation year. There are some companies that have resubmitted 2018 & 2019 data which has caused a delay in preparing their 2020 data.
- Many of the initial data submissions have over 80% acceptable data. This is significantly improved from the 2021 data collection.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## 2022 Data Collection A/E Ratios

- For the 2021 data collection, we provided Actual to Expected mortality ratios with some key breakouts (gender, smoker status, product type, etc.).
- For the 2022 data collection, we are preparing an Excel workbook with pivot tables that will allow companies to filter the results by up to 12 categories. This will be provided with the company's feedback package from the NAIC.
  - Some of the additional categories include Issue Year, Type of Underwriting Requirements, Issue Age, etc.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

## Recommendation for Deadline Extension

- The VM-51 deadline for corrected data submissions is 12/31/2022.
- NAIC staff recommends a deadline extension to 2/28/2023 to allow companies more time to review NAIC feedback, provide responses, and make corrections as needed.
  - Companies may need to submit more than one corrected file. We encourage companies to resubmit as soon as they feel they have addressed the data exceptions and any questions from the NAIC.
  - Since the NAIC is still working with companies to finalize the 2018 and 2019 data, this extension will allow the NAIC to have more time to analyze the 2020 data.
- This is not expected to delay delivery of aggregated data to the SOA by 5/31/2023.

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

November 17, 2022

**To:** Members of the Life Actuarial (A) Task Force

**From:** NAIC Staff

**RE:** Guidance on Allocating Negative IMR (PIMR) In VM-20, VM-21, and VM-30

### **Executive Summary**

With the rapidly rising interest rate environment, companies selling fixed income assets for a loss are seeing their Interest Maintenance Reserve (IMR) balances decrease or even become negative. Current statutory accounting treatment makes negative IMR a non-admitted asset. While a longer-term evaluation of IMR is being considered by the Statutory Accounting Practices (E) Working Group (SAPWG), additional guidance on the proper practice for allocating IMR for Asset Adequacy Testing and Principle-based Reserving purposes may be helpful for companies in the near term.

### **Background**

The letter to SAPWG from the American Council of Life Insurers (ACLI) (Attachment 1) notes that "...with the inclusion of a negative IMR balance in asset adequacy testing, the disallowance of a negative IMR can result in double counting of losses (i.e., through the disallowance on the balance sheet and the potential AAT-related reserve deficiency)." There are several sections of the Valuation Manual and RBC instructions where IMR is referenced in the letter. Some of these references contemplate allocating negative IMR (or pre-tax IMR (PIMR), as applicable) at the level of business that is being analyzed/reserved for. However, these references do not detail what to do when the total company IMR balance is negative – and therefore a non-admitted asset under current statutory guidance.

Other references do provide additional insight as to the allocation of IMR when the total company balance is negative/disallowable. VM-20 Section 7.D.7.b notes that "...the company shall use a reasonable approach to allocate any portion of the total company balance that is disallowable under statutory accounting procedures (i.e., when the total company balance is an asset rather than a liability)." Question 22 of the AAA's Asset Adequacy Practice Note (Attachment 2) states that "... a negative IMR is not an admitted asset in the annual statement. So, some actuaries do not reflect a negative value of IMR in the liabilities used for asset adequacy analysis." However, Question 22 also notes a 2012 survey data that showed varying practices across companies, including some companies that allocated negative IMR.

### **Recommendation**

In order to assist state regulators and companies in achieving uniform outcomes for year-end 2022, we have the following recommendation: the allocation of IMR in VM-20, VM-21, and VM-30 should be principle-based, "appropriate", and "reasonable". Companies are not required to allocate any non-admitted portion of IMR (or PIMR, as applicable) for purposes of VM-20, VM-21, and VM-30, as being consistent with the asset handling for the non-admitted portion of IMR would be part of a principle-based, reasonable and appropriate allocation. However, if a company was granted a permitted practice to admit negative IMR as an asset, the company should allocate the formerly non-admitted portion of negative IMR, as again a principle-based, reasonable and appropriate IMR allocation would be consistent with the handling of the IMR asset. This recommended guidance is for year-end 2022, to address the current uncertainty and concerns with the "double-counting" of losses. This recommended guidance will help ensure consistency between states and between life insurers in this volatile rate environment. Refinement of this guidance may be considered beyond year-end 2022.

# Attachment 1



**Mike Monahan**

Senior Director, Accounting Policy  
202-624-2324 t  
[mikemonahan@acli.com](mailto:mikemonahan@acli.com)

**Paul Graham**

Senior Vice President, Chief Actuary  
202-624-2164 t  
[paulgraham@acli.com](mailto:paulgraham@acli.com)

October 31, 2022

Mr. Dale Bruggeman, Chairman  
Statutory Accounting Principles Working Group  
National Association of Insurance Commissioners  
1100 Walnut Street, Suite 1500  
Kansas City, MO 64106-2197

Dear Mr. Bruggeman:

**Re: Proposal for the NAIC to Fulfil the Original Intent of the Interest Maintenance Reserve**

The American Council of Life Insurers (ACLI) would like to request urgent action on an issue that was never fully resolved by the NAIC and has become a pressing matter for the industry due to the rapid rise in interest rates – the allowance of a net negative Interest Maintenance Reserve (IMR) balance.

The ACLI proposes the allowance of a negative IMR balance in statutory accounting. Negative IMR balances are expected to become more prevalent in a higher interest rate environment and their continued disallowance will only serve to project misleading optics on insurers' financial strength (e.g. inappropriate perception of decreased financial strength through lower surplus and risk-based capital even though higher rates are favorable to an insurer's financial health) while creating uneconomic incentives for asset-liability management (e.g. discourage prudent investment transactions that are necessary to avoid mismatches between assets and liabilities just to avoid negative IMR).

ACLI believes the necessary changes can be implemented quickly and with minimal changes to the annual statement reporting instructions.

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The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

[acli.com](http://acli.com)

The remainder of this letter expands upon these points.

### **Historical Context and Background**

The IMR, first effective in statutory accounting in 1992, requires that a realized fixed income gain or loss, attributable to changes in interest rates (but not gains or losses that are credit related), be amortized into income over the remaining term to maturity of the fixed income investments (and related hedging programs) sold rather than being reflected in income immediately.

Since statutory accounting practices for life insurance companies are the primary determinant of obtaining an accurate picture for assessing solvency, it was imperative that the accounting practices be consistent for assets, liabilities, and income and that they be reported on a financially consistent basis. If assets and liabilities were not reported on a financially consistent basis, then the financial statements would not be useful in determining an accurate assessment of solvency or whether there were sufficient assets to pay contractual obligations when they become due.

Amortized cost valuation of fixed income investments reflects the outlook at the time of purchase and amortization reflects the yields available at time of purchase. Policy reserve liabilities are established at the same time, and the interest rate assumptions are consistent with the yields at that time. But if fixed income investments are sold, with the proceeds reinvested in new fixed income investments, a new amortization schedule is established which may be based on an entirely different yield environment, which may be inconsistent with the reserve liabilities when they were established.

IMR was created to prevent the timing of the realization of gains or losses on fixed income investments, related to interest rates changes, to affect the immediate financial performance of the insurance company. This recognized that the gains and losses were transitory without any true economic substance since the proceeds would be reinvested at offsetting lower or higher interest rates.

For example, without the IMR, if a company sold all bonds in a declining interest environment (e.g., from 4% to 2%), and reinvested in new bonds, surplus would increase through significant realized gains. The increased surplus would inappropriately reflect increased financial strength that is illusory, due to a now lower yielding portfolio, as there would be no change to the income needed to support the liabilities.

Likewise, if a company sold all bonds in an increasing interest rate environment (e.g., from 2% to 4%), and reinvested in new bonds, surplus would decrease through significant realized losses. The decreased surplus would inappropriately reflect decreased financial strength that is similarly illusory due to the reinvestment at higher yields relative to when the bonds were originally purchased.

A net negative IMR is currently disallowed in statutory accounting. This handling is contrary to its original intent which recognized that interest related gains and losses are both transitory without any true economic substance since the proceeds would be reinvested at offsetting lower or higher interest rates, respectively. See attachment I to this letter that illustrates the financially consistent

treatment of assets, liabilities, and income and how IMR is needed to achieve that objective for both realized gains and losses.

That IMR should conceptually apply to both realized gains and losses was recognized by the NAIC during and after IMR development. The below is a quote from a 2002 report by the NAIC AVR/IMR Working Group to the E-Committee:

*“The basic rationale for the IMR would conclude that neither a maximum nor a minimum is appropriate. If the liability values are based on the assumption that the assets were purchased at about the same time as the liabilities were established, then there should be no bounds to the reserve which corrects for departures from that assumption; **if a company has to set up a large reserve because of trading gains, it is in no worse position than if it had held the original assets. As for negative values of the IMR, the same rationale applies. However, the concept of a negative reserve in the aggregate has not been adopted.**”*

While realized losses can offset realized gains in IMR, the IMR instructions require the disallowance of a net negative IMR balance (e.g., as noted in the last sentence of the aforementioned quote). See attachment II to this letter, which includes the pertinent IMR instructions where negative IMR balances are currently disallowed and in need of amendment.

When IMR was originally developed, it was intended to achieve its purpose in both a declining and rising interest rate environment. The originally adopted disallowed status of a negative IMR was expected to be addressed in subsequent years. However, over time with the persistent declining interest rates, the issue lost urgency since a negative IMR would not have been a significant issue for any company. The NAIC AVR/IMR Working Group ultimately disbanded without ever addressing this longstanding item on their agenda.

With a rising interest rate environment, it is important that the allowance of a negative IMR be addressed to fulfill its original purpose. In general, rising interest rates are favorable to the financial health of the insurance industry as well as for policyowners.

Without a change, the rising interest rate environment will give the inappropriate perception of decreased financial strength through lower surplus and risk-based capital and worse, create incentives for insurance companies to take action, or not take actions, to prevent uneconomic surplus impacts where the actions (or lack thereof) themselves may be economically detrimental.

Symmetrical treatment of a negative IMR (i.e., the allowance of a negative IMR balance) would appropriately not change surplus as a sale and reinvestment would not affect the underlying insurance company liquidity, solvency, or claims paying ability, just like with a positive IMR. See attachment III to this letter that illustrates that the sale of a fixed income investment, and reinvestment in a new fixed income investment, has no bearing on a life insurance company's liquidity, solvency, or claims paying ability.

As it was initially recognized by the NAIC that IMR should apply to both gains and losses, adequate safeguards were already built into the IMR instructions for asset adequacy, risk-based capital, and troubled companies.

#### **Negative IMR – Reserve Adequacy and Risk-Based Capital**



When IMR was developed, it was anticipated that a negative IMR balance would be reflected in asset adequacy analysis. This inclusion ensures that the assets, with the appropriate allocation from the IMR (whether negative or positive), would be adequate to fund future benefit obligations and related expenses of the company.

From the standpoint of reserve adequacy, the inclusion of a negative IMR balance appropriately reduces the investment income in asset adequacy testing. Without the inclusion of negative IMR, reserve inadequacies would potentially not be recognized.

Further, with the inclusion of a negative IMR balance in asset adequacy testing, the disallowance of a negative IMR can result in double counting of losses (i.e., through the disallowance on the balance sheet and the potential AAT-related reserve deficiency). The Actuarial Opinion that covers asset adequacy analysis requires the appropriate assessment of negative IMR in its analysis.

If a negative IMR balance is used in the asset adequacy analysis, its allowance is appropriate. Likewise, if only a portion of a company's negative IMR balance is reflected in the asset adequacy analysis, only the allowance for that portion of the negative IMR balance reflected is appropriate. If a negative IMR balance is disallowed, it would be inappropriate to include in asset adequacy analysis. It is imperative there is symmetry between both reserving and accounting considerations, and there is already precedent in the asset adequacy analyses for inclusion of IMR.

Below are the current references to IMR in the valuation manual and risk-based capital calculations.

Regulation	Use	IMR references
Actuarial Opinion and Memorandum Regulation (VM-30)	Asset adequacy analysis for annual reserve opinion	An appropriate allocation of assets in the amount of the IMR, whether positive or negative, shall be used in any asset adequacy analysis.
Life principle-based reserves (VM-20)	Calculation of deterministic reserve	Calculate the deterministic reserve equal to the actuarial present value of benefits, expenses, and related amounts less the actuarial present value of premiums and related amounts, less the positive or negative pre-tax IMR balance at the valuation date allocated to the group of one or more policies being modeled
Life principle-based reserves (VM-20)	Calculation of stochastic reserve	Add the CTE amount (D) plus any additional amount (E) less the positive or negative pre-tax IMR balance allocated to the group of one or more policies being modeled
Variable annuities principle-based reserves (VM-21)	Reserving for variable annuities	The IMR shall be handled consistently with the treatment in the company's cash-flow testing, and the amounts should be adjusted to a pre-tax basis.
C3 Phase 1 (Interest rate risk capital)	RBC for fixed annuities and single premium life	IMR assets should be used for C3 modeling.

**Additional IMR Safeguards**

The IMR instructions do provide additional safeguards in situations where it would be appropriate to recognize interest-rate related gains and losses immediately rather than be included in the IMR.

They were established to prevent situations where the liability the IMR supports, no longer exists. Examples noted in the annual statement instructions include:

- Major book-value withdrawals or increases in policy loans occurring at a time of elevated interest rates.
- Major book value withdrawals resulting from a “run on the bank” due to adverse publicity.

As a result, the IMR instructions include an IMR Exclusion whereby all gains or losses which arise from the sale of investments related to “Excess Withdrawal Activity” are to be excluded from IMR and reflected in net income. In short, Excess Withdrawal Activity is defined as 150% of the product of the lower of the withdrawal rate in the preceding or in the next preceding year calendar year times the withdrawal reserves at the beginning of the year.

### **Summary**

With a rising interest rate environment, it is important that the allowance of a negative IMR be addressed to fulfill its original purpose. In general, rising interest rates are favorable to the financial health of the insurance industry as well as for policyowners. Without a change, the rising interest rate environment will give the inappropriate perception of decreased financial strength through lower surplus and risk-based capital.

The inability to recognize negative IMR could also impact the rating agency view of the industry, or worse, incentivize companies to avoid prudent investment transactions that are necessary to avoid mismatches between assets and liabilities. Furthermore, there are adequate safeguards in place to ensure that allowing a negative IMR does not cause any unrecognized reserve or capital inadequacies or any overstatement of claims paying ability.

Current statutory accounting guidance creates two equally objectionable alternatives for insurers and their policyowners. Following the current statutory guidance will improperly reflect financial strength through understating surplus, so additional surplus may need to be retained. Alternatively, one could take steps to manage the current situation by limiting trading of fixed income investments and related hedging programs, which would diminish significant economic value for policyowners, as well as create a mismatch between assets and liabilities.

Both scenarios encourage short-term non-economic activity not in the best long-term interest of the insurance company’s financial health or its policyowners. For insurers with diminishing IMR balances due to the rapid increase in interest rates, this dilemma is either here or fast approaching and can only be resolved now with certainty of the appropriate treatment of IMR by the NAIC.

The ACLI looks forward to urgently working with the NAIC toward fulfilling the original intent of IMR. It is imperative that insurers receive relief for year-end 2022.

If you have any questions regarding this letter, please do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink that reads "Monahan". The signature is written in a cursive style with a large, sweeping initial "M".

Mike Monahan  
Senior Director, Accounting Policy

A handwritten signature in black ink that reads "Paul A. Graham". The signature is written in a cursive style with a large, sweeping initial "P".

Paul Graham  
Senior Vice President, Chief Actuary

Attachment I

**Simplified Example – Need for Reporting Assets, Liabilities, and Income on a Consistent Basis:**

- This example shows the appropriate interrelationship of IMR on assets, reserve liabilities, and income.
- Assume a bond is held with the following characteristics:
  - Par Value: \$1,000
  - Coupon: 3%
  - Term-to-maturity: 10 years
- Assume the bond is then sold at “time zero” and the proceeds are immediately reinvested in a bond with the same characteristics (e.g., term-to maturity, credit quality, coupon equivalent to market rate, etc.).
- Assume a simplified example with no existing IMR balance, where the bond supports a fixed insurance liability with the same duration as the original bond, as well as a present value of \$1,000.

Table 1: Market Interest Rate Scenario			
	Same	Lower	Higher
Market interest rate	3%	2%	4%
Bond’s market value	\$1,000	\$1,090	\$919
Realized gain/(loss) if sold	\$0	\$90	(\$81)*

Realized gain/(loss) deferred to balance sheet IMR and amortized into income over remaining life of bond sold (i.e., 10 years).

Table 2: Statutory Investment Income			
IMR amortization	\$0	\$9	(\$8)
Interest income on new bond	\$30	\$21	\$38
Total annual stat income	\$30	\$30	\$30

On average, future income is approximately the same in each interest rate scenario as the IMR gets reduced through amortization to income.

Table 3: Statutory Balance Sheet			
Balance Sheet Bonds	\$1,000	\$1,090	\$919
IMR	\$0	(\$90)	\$0*
Stat assets net of IMR	\$1,000	\$1,000	\$919*
Reserves	\$1,000	\$1,000	\$1,000
Surplus	\$0	\$0	(\$81)*

Even though the sale of the bond (and subsequent reinvestment) is non-economic, and the same income is being produced to support the liability, a negative surplus position makes it appear there is now a deficiency. Allowing the negative IMR appropriately would show no surplus impact, as is shown when a gain occurs, as there is no change in reported reserve liabilities. Appropriately consistent financial results require the allowance of negative IMR

**\*The negative IMR balance is currently disallowed and directly reduces surplus. This treatment is not supported by theoretical rationale and gives a distorted view of solvency.**

**Attachment II**

**Pertinent Annual Statement Instructions**

Line 6 – Reserve as of December 31, Current Year

Record any positive or allowable negative balance in the liability line captioned “Interest Maintenance Reserve” on Page 3, Line 9.4 of the General Account Statement and Line 3 of the Separate Accounts Statement. A negative IMR balance may be recorded as a negative liability in either the General Account or the Separate Accounts Statement of a company only to the extent that it is covered or offset by a positive IMR liability in the other statement.

If there is any disallowed negative IMR balance in the General Account Statement, include the change in the disallowed portion in Page 4, Line 41 so that the change will be appropriately charged or credited to the Capital and Surplus Account on Page 4. If there is any disallowed negative IMR balance in the Separate Accounts Statement, determine the change in the disallowed portion (prior year less current year disallowed portions), and make a direct charge or credit to the surplus account for the “Change in Disallowed Interest Maintenance Reserve” in the write-in line, in the Surplus Account on Page 4 of the Separate Accounts Statement.

The following information is presented to assist in determining the proper accounting:

General Account IMR Balance	Separate Account IMR Balance	Net IMR Balance
Positive	Positive	Positive (see rule a)
Negative	Negative	Negative (see rule b)
Positive	Negative	Positive (see rule c)
Positive	Negative	Negative (see rule d)
Negative	Positive	Positive (see rule e)
Negative	Positive	Negative (see rule f)

Rules:

- a. If both balances are positive, then report each as a liability in its respective statement.
- b. If both balances are negative, then no portion of the negative balances is allowable as a negative liability in either statement. Report a zero for the IMR liability in each statement and follow the above instructions for handling disallowed negative IMR balances in each statement.
- c. If the general account balance is positive, the separate accounts balance is negative and the combined net balance is positive, then all of the negative IMR balance is allowable as a negative liability in the Separate Accounts Statement.
- d. If the general account balance is positive, the separate account balance is negative, and the combined net balance is negative, then the negative amount not covered by the positive amount is not allowable. Report only the allowable portion as a negative liability in the Separate Accounts Statement and follow the above instructions for handling the disallowed portion of negative IMR balances in the Separate Accounts Statement.
- e. If the general account balance is negative, the separate account balance is positive, and the combined net balance is positive, then all of the negative IMR balance is allowable as a negative liability in the General Account Statement.
- f. If the general account balance is negative, the separate account balance is positive, and the combined net balance is negative, then the negative amount not covered by the positive amount is not allowable. Report only the allowable portion as a negative liability in the General Account Statement and follow the above instructions for handling the disallowed portion of negative IMR balances in the General Account Statement.

Attachment III

IMR Illustration – Liquidity, Solvency and Claims Paying Ability

Essentially, a negative IMR balance from an individual trade represents the present value of the future positive interest rate differential, from the new investment compared to the old investment, that puts one in the same economic position, when compared to before the trade, including total liquid assets available to pay claims.

This phenomenon can be illustrated in the following table where a 10-year bond is sold, one year after purchase, and immediately reinvested in another 10-year bond with equivalent credit quality in an interest rate environment where market interest rates increased from 2% to 4% in the intervening year.

	Coupon Rate of Bond	Market Interest Rate @ Purchase	Par Value of Bond	Fair Value @ Purchase	Fair Value @ Time of Sale	Loss on Sale	Claims Paying Liquidity
Old Bond	2%	2%	100	100	85.13	14.87	85.13
New Bond	4%	4%	85.13	85.13	85.13	N/A	85.13

The short-term acceleration of negative IMR to surplus (e.g., its disallowance) is strictly a timing issue and not a true loss of financial strength or claims paying liquidity, but it does present a temporary and inappropriate optics issue in surplus/financial strength until the IMR is fully amortized.

This phenomenon can further be illustrated by comparing two separate hypothetical companies. Assume Company A and B both have the exact same balance sheets. Then assume Company A keeps the old bond and Company B affects the trade mentioned above.

With the disallowance of a negative IMR balance, Company B now has a balance sheet that shows a relative decline of financial strength of \$14.87. This weakened balance sheet contrasts with both the principle behind the development of IMR, the relative actual economic financial strength, and claims paying ability of the two entities.

There is no difference in balance sheet economics of the two entities. The negative IMR balance for Company B essentially represents the difference between cost and fair value of the investment sold, that is already embedded on Company A’s balance sheet based on the existing interest rate environment. The negative IMR balance should be recognized as there is no change in economics pre and post trade (or in this instance between Company A and Company B) which is consistent with the overall principle behind IMR.

# Attachment 2

Some actuaries test the option risk in assets (e.g., calls) by assuming an immediate drop in the discount rate used in the GPV. The drop test is often set as severe as needed to represent a drop in earned rate that would occur if all options were exercised.

**Q22. The AOMR states that the interest maintenance reserve (IMR) should be used in asset adequacy analysis. Why?**

The IMR is part of the total reported statutory reserves. The IMR typically defers recognition of the portion of realized capital gains and losses resulting from changes in the general level of interest rates. These gains and losses are amortized into investment income over the expected remaining life of the investments sold, rather than being recognized immediately. This amortization is after tax.

The purpose of the IMR usually is to maintain the original matching between assets and liabilities that might be weakened by the sale of an asset. Originally, it was anticipated that the IMR would be allowed to become negative, as long as the asset adequacy analysis showed that the total statutory reserves, including the negative IMR, were sufficient to cover the liabilities. However, a negative IMR is not an admitted asset in the annual statement. So, some actuaries do not reflect a negative value of IMR in the liabilities used for asset adequacy analysis.

In the 2012 survey of appointed actuaries, more than 80 percent of the respondents indicated they include the IMR in their testing. Some actuaries use a starting IMR of zero if IMR is negative. Other actuaries use negative IMR to adjust starting assets and therefore model future lower asset yields than if zero IMR were assumed. Half of the respondents who indicated they used IMR in testing also indicated they lower assets by the absolute value of a negative IMR balance; the other half indicated they use a value of zero for the starting IMR if it is negative at the beginning of the projection period. There is no prohibition regarding the use of negative IMR within asset adequacy analysis. So, a number of actuaries allow the IMR to fall below zero within the testing period. About 60 percent of actuaries responding to the survey indicated they do not have to deal with a negative IMR.

**Q23. How does the actuary determine which portion of the IMR can be used to support certain products? How is the portion of the IMR used?**

If the actuary allocates the assets and IMR by line, then one possible approach is line of business-level inclusion of starting assets in the amount of the unamortized portion of the IMR relating to those assets that were owned by the line prior to being sold. Another possible approach is the allocation of company-level IMR proportionately to starting assets. An advantage of this second approach is that it is generally simpler, while a disadvantage is that longer liabilities probably have longer assets, which usually produce higher capital gains when sold, after a given drop in interest rates, than shorter assets do,



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November 30, 2022

Ms. Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Re: Negative IMR handling in Principle-based Reserves and Asset Adequacy Testing

Dear Ms. Hemphill:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the exposure soliciting feedback on 2022 year-end guidance on the handling of negative IMR in VM-20, VM-21, and VM-30.

ACLI appreciates LATF's intent on providing guidance on the handling of negative IMR in principle-based reserves and asset adequacy testing. As stated in our letter to the Statutory Accounting Practices Working Group (SAPWG), ACLI believes that the NAIC should review the current practice of non-admitting net negative IMR on the balance sheet. The IMR is a necessary component of an amortized cost-based accounting system when market-value sales of assets occur to ensure a consistent matching of assets and liabilities. It neutralizes the impact of the capital gains or losses, which keeps the timing of the asset returns consistent with the liability valuation rates. However, until that review by SAPWG is completed, there is a potential for double-counting of capital losses when an actuary includes a net negative IMR in the calculation of principle-based reserves or in their asset adequacy testing.

The staff letter to LATF includes the following recommendation:

In order to assist state regulators in achieving uniform outcomes for year-end 2022, we have the following recommendation: the allocation of IMR in VM-20, VM-21, and VM-30 should be principle-based, "appropriate", and "reasonable". Companies are not required to allocate any non-admitted portion of IMR (or PIMR, as applicable) for purposes of VM-20, VM-21, and VM-30, as being consistent with the asset handling for the non-admitted portion of IMR would be part of a principle-based, reasonable and appropriate allocation. However, if a company was granted a permitted practice to admit negative IMR as an asset, the company should allocate the formerly non-admitted portion of negative IMR, as again a principle-based, reasonable and appropriate IMR allocation would be consistent with the handling of the IMR asset. This recommended guidance is for year-end 2022, to address the current uncertainty and concerns with the "double-counting" of

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The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

losses. This recommended guidance will help ensure consistency between states and between life insurers in this volatile rate environment. Refinement of this guidance may be considered beyond year-end 2022.

ACLI agrees with the recommendation but would suggest a slight change to the wording to include some background for the recommendation, as well as a few clarifying edits. We suggest the following:

With the rapidly rising interest rate environment, there is a growing likelihood that life insurers will have a net negative Interest Maintenance Reserve (IMR) for year-end 2022. While NAIC statutory accounting non-admits any net negative IMR, the NAIC Valuation Manual does not explicitly provide guidance on what an “appropriate” allocation of a net negative IMR should be in the calculation of principle-based reserves or in asset adequacy testing. As a result, actuaries are making different interpretations for the treatment of net negative IMR. In order to assist state regulators and companies in achieving uniform outcomes for year-end 2022, we have the following recommendation: LATF recommends that the allocation of IMR in VM-20, VM-21, and VM-30 should be principle-based, “appropriate”, and “reasonable”. Companies are not required to allocate any non-admitted portion of IMR (or PIMR, as applicable) for purposes of VM-20, VM-21, and VM-30, as being consistent This consistency with the asset handling in the balance sheet for the non-admitted portion of IMR would be part of a principle-based, reasonable, and appropriate allocation. However, if a company was has been granted a permitted practice to admit negative IMR as an asset, the company should allocate include the formerly non-admitted portion of negative IMR in the calculation of principle-based reserves and in asset adequacy testing. as again a principle-based, reasonable, and appropriate IMR allocation would be consistent with the handling of the IMR asset. This recommended guidance is for year-end 2022, to address the current uncertainty and concerns with the “double-counting” of capital losses. This recommended guidance will help ensure consistency between states and between life insurers in this volatile rate environment. Refinement of this guidance may be considered beyond year-end 2022.

Ultimately, ACLI believes that non-admitting IMR is not necessary, as any shortfall in assets necessary to retire the liabilities will be evident in asset adequacy testing, requiring higher reserves. Furthermore, reserves developed under VM-20 and VM-21 also reflect IMR allocated to the block of reserves, which would serve to increase policy reserves when IMR is negative.

In the meantime, while SAPWG considers this issue, this guidance from LATF to state regulators and companies regarding negative IMR is very important. Future guidance should align with any decisions made by SAPWG regarding the handling of net negative IMR.

ACLI thanks you for your quick attention to this matter.

Sincerely,



Paul S. Graham, III, FSA, MAA



Mike Monahan

cc: Scott O’Neal, NAIC

## Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force Amendment Proposal Form\*

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

Brian Bayerle, ACLI – Clarify requirements on groups of contracts that use the Alternative Method/AG33 in VM-21 and are not subject to a principles-based valuation. Such contracts should not be not subject to VM-G but still require a sub-report under VM-31.

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:

Valuation Manual Jan. 1, 2023 Edition; VM-21 Section 3.E, VM-31 Section 2.A, VM-G Section 1 and Section 4.A.3.

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

See attached.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

There is some ambiguity about the governance requirements if a principles-based valuation is not performed.

---

\* This form is not intended for minor corrections, such as formatting, grammar, cross-references or spelling. Those types of changes do not require action by the entire group and may be submitted via letter or email to the NAIC staff support person for the NAIC group where the document originated.

NAIC Staff Comments:

<b>Dates:</b> Received	Reviewed by Staff	Distributed	Considered
11/4/22	SO		
<b>Notes:</b> APF 2022-08			

## VM-21

### **Section 3: Reserve Methodology**

#### E. Alternative Methodology

For a group of variable deferred annuity contracts that contain either no guaranteed benefits or only GMDBs—i.e., no VAGLBs—the reserve may be determined using the Alternative Methodology described in Section 7 rather than using the approach described in Section 3.C and Section 3.D. However, in the event that the approach described in Section 3.C and Section 3.D has been used in prior valuations for that group of contracts, the Alternative Methodology may not be used without approval from the domiciliary commissioner.

The reserve for the group of contracts to which the Alternative Methodology is applied shall not be less than the aggregate cash surrender value of those contracts.

Groups of contracts to which the Alternative Methodology is applied are only subject to the applicable requirements for the Alternative Methodology in VM-21. Groups of contracts to which the Alternative Methodology is applied are subject to the applicable sub-report requirements outlined in VM-31 Sections 3.E and 3.F. Groups of contracts to which the Alternative Methodology is applied are not subject to the requirements of VM-G Sections 2 and 3.

## VM-31

### **Section 2: General Requirements**

- A. Each year a company shall prepare, under the direction of one or more qualified actuaries, as assigned by the company under the provisions of VM-G, a PBR Actuarial Report if the company computes a deterministic reserve or stochastic reserve or performs an exclusion test for any policy as defined in VM-20, or computes an aggregate reserve for any contract as defined in VM-21.

A company that does not compute any deterministic or stochastic reserves under VM-20 for a group of policies as a result of the policies in that group passing the exclusion tests as defined in VM-20 Section 6 must still develop a sub-report for that group of policies that addresses the relevant requirements of Section 3.

A company that computes reserves under the Alternative Methodology defined in VM-21 must still develop a sub-report with the applicable requirements to the Alternative Methodology for that group of policies that addresses the relevant requirements of Section 3.

## VM-G

### **Section 1: Introduction, Definition and Scope**

- A. The corporate governance guidance provided in VM-G is applicable only to a principle-based valuation calculated according to methods defined in VM-20 and VM-21, except for the following condition:

For a company that does not compute any deterministic or SR under VM-20 as a result of passing the exclusion tests as defined in VM-20 Section 6, and ~~it does not calculate any~~ all contracts subject to reserves under VM-21 are determined by application of the Alternative Methodology, VM-G Sections 2 and 3 below are generally not applicable; the requirements of Section 4 are still applicable. However, if the company calculated the SERT using the DR method outlined in VM-20 Section 6.A.2.b.i.a, or the Stochastic Exclusion Demonstration Test outlined in VM-20 Section 6.A.3, then VM-G Sections 2 and 3 are applicable.

#### Section 4: Responsibilities of Qualified Actuaries

- A.3 The responsibility for providing a summary report to the board and to senior management on the valuation processes used to determine and test PBR, the principle-based valuation results, the general level of conservatism incorporated into the company's PBR, the materiality of PBR in relationship to the overall liabilities of the company, and significant and unusual issues and/or findings.

If Sections 2 and 3 are not applicable because the company met the requirements to be exempt from Section 2 and Section 3 as outlined in Section 1.A, this particular reporting to board and senior management is limited to:

- a. For VM-20, notifying senior management if the company is at risk of failing either exclusion test, and if so, reporting on the company's readiness to calculate deterministic and SR; and
- b. For VM-21, notifying senior management if the company may not be able to use the Alternative Methodology for all business subject to VM-21, and if so, reporting on the company's readiness to calculate a SR.

# Life Practice Council Update

Ben Slutsker, MAAA, FSA  
Vice President, Life Practice Council

Donna Claire, MAAA, FSA  
Chairperson, Life Experience Committee

Life Actuarial Task Force (LATF) Meeting  
December 12, 2022

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## Academy Webinars and Events

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- Recent
  - Webinar on VM-31 Principle-Based Reserves (PBR) Actuarial Report Reviews (Nov. 9)
  - Annual Meeting—Envision Tomorrow (Nov. 2 – 3)
  - Inflation webinar (Oct. 29)
  - ASOP No. 22 webinar related to asset adequacy testing—The Revised ASOP No. 22: What You Need to Know (July 28)
- Upcoming
  - Post-NAIC update on asset topics
  - PBR webinars in 2023

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## Recent Activity

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- Presented further input for the newly adopted C-2 mortality factors to the NAIC's Life Risk-Based Capital (E) Working Group
  - An in-depth document on how to classify different products into the new C-2 categories (pricing flexibility vs. without pricing flexibility)
- Provided further input to LATF on transitioning from London Inter-Bank Offered Rate (LIBOR) to Secured Overnight Financing Rate (SOFR), following the adoption of APF 2022-04
  - Worked with NAIC to develop more details around methodology for the transition

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## Recent Activity (continued)

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- Shared a comment letter for the NAIC's Index-Linked Variable Annuity (A) Subgroup on the nonforfeiture interim value actuarial guideline exposure
- Submitted multiple comment letters on IUL illustrations to the NAIC's Indexed Universal Life (IUL) Illustration (A) Subgroup and Life Actuarial (A) Task Force
- Developed multiple education sessions on economic scenario generators and acceptance criteria for the NAIC's Life Actuarial (A) Task Force
- Provided a proposal for the NAIC's Valuation Manual (VM)-22 (A) Subgroup for exclusion testing on single premium immediate annuities

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## Academy Life Experience Committee

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- A committee to assist practicing actuaries and regulators with respect to assumptions regarding life insurance and annuity products
- Requesting feedback from regulators as to what topics they would like to be addressed

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## Reflection of COVID-19 in Mortality Improvement

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- LATF answered question as to the maximum historical and future mortality improvement rates that can be used in PBR
- Academy Life Experience Committee worked on considerations for actuaries in asset adequacy, PBR, and company testing:
  - How does own experience compare?
  - Expectations for future
- Margins used in mortality improvement rates for PBR testing and asset adequacy do not have to be the same, but differences should be justified
  - *Reflection of COVID-19 in Life Insurance Mortality Improvement (actuary.org)*

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## Discussion Brief on Inflation

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- Meant to provide ideas of what actuaries should consider with respect to current economy when doing PBR and asset adequacy testing, product development and pricing, business planning
- Should consider inflation/economy in terms of
  - Interest rate scenarios
  - Stock market volatility
  - Potential recession
- Provides sources of information on where to find more details
  - [Reflection of Inflation, Interest Rates, Stock Market Volatility and Potential Recession \(actuary.org\)](#)

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## Discussion Brief on Credibility

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- In much of the work actuaries do, there is the concept of relevant and credible experience
- What is relevant and credible, for example:
  - What to consider when using industry data?
  - How many lapses make for credible data?
  - What to do when considering outliers?
- Provides sources of information on where to find more details (includes Valuation Manual, Society of Actuaries, Canadian Institute of Actuaries, Academy and other sources)
- [https://www.actuary.org/sites/default/files/2022-12/Credibility\\_Discussion\\_Brief.pdf](https://www.actuary.org/sites/default/files/2022-12/Credibility_Discussion_Brief.pdf)

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## Discussion Brief on Margins

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- In much of the work actuaries do, they deal with assumptions as to what happens in the future depending on the work done, margins should be added to the best estimate assumption to develop prudent estimates.
- How should margins be determined:
  - Sometimes guidance is given, e.g., the Valuation Manual states that prudent margins should be on all assumptions
  - Some feel that margins should cover X% (e.g. one standard deviation) of past experience
  - Sometimes things are not that clear
- Brief provides sources of information on where to find more details (includes valuation manual, SOA, CIA, Academy, UK and other sources)
- [https://www.actuary.org/sites/default/files/2022-12/Margins\\_Discussion\\_Brief.pdf](https://www.actuary.org/sites/default/files/2022-12/Margins_Discussion_Brief.pdf)

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## Thank you

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Questions?

- For more information, please contact the Academy's life policy analyst, Amanda Barry-Moilanen, at [barrymoilanen@actuary.org](mailto:barrymoilanen@actuary.org).

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# SOCIETY OF ACTUARIES RESEARCH UPDATE TO LATF

December 11, 2022

R. DALE HALL, FSA, MAAA, CERA, CFA  
Managing Director of Research



## Presentation Disclaimer

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## 2022 Mortality Improvement Company Survey

- Follow up to Mortality Improvement Survey done for Yearend 2018
- Current Survey investigates impact of pandemic
- Examines durational improvement assumptions for individual life and annuity pricing and financial reporting
- Investigates by Age and Duration



## Comparison of Median Results

### Life Products

Age	Pricing Year 1		Pricing Year 21	
	2019	2022	2019	2022
35	0.73%	0.65%	0.80%	0.50%
55	1.00	1.00	1.00	0.75
75	1.03	1.15	1.01	0.63
95	0.26	0.35	0.40	0.00

Age	Financial Year 1		Financial Year 21	
	2019	2022	2019	2022
35	0.65%	0.60%	0.75%	0.75%
55	0.90	0.90	0.79	0.75
75	1.00	1.00	1.00	0.75
95	0.44	0.40	0.40	0.25

### Annuity Products

Age	Pricing Year 1		Pricing Year 21	
	2019	2022	2019	2022
35	1.00%	1.00%	0.84%	0.88%
55	1.20	1.20	1.00	1.00
75	1.44	1.05	1.30	1.00
95	0.40	0.20	0.35	0.20

Age	Financial Year 1		Financial Year 21	
	2019	2022	2019	2022
35	1.00%	1.00%	1.00%	1.00%
55	1.21	1.00	1.20	1.00
75	1.34	1.00	1.30	1.00
95	0.40	0.47	0.40	0.30



## Key Takeaways

- Mortality improvement factors from 2022 (prior to COVID-19 adjustments) are generally lower than 2019 for life, and lower at older attained ages for annuity products.
- Median mortality improvement rates tend to be lower for females than males, especially for life products.
- Mortality improvement factors tend to be higher in Year 1 than in later years, especially for life pricing
- To date, few companies have adjusted their durational mortality improvement rates because of COVID-19.



## MIM-2021-v3

- Consistent approach for projecting mortality improvement across actuarial practice areas
- Introduced in 2021
- Third iteration: Report, tools, and user guides; updated annually
- Application Tool has been modified
  - New user interface
  - Introduction of parameter set for life and annuity products
  - Expansion of COVID mortality adjustment

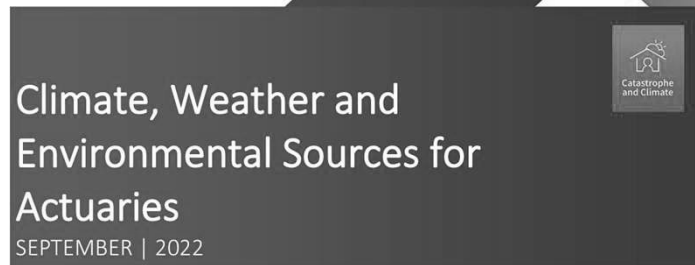


<https://www.soa.org/resources/research-reports/2022/mortality-improvement-model/>



## Climate, Weather and Environmental Sources for Actuaries

- Update of the 2016 report
- Collection of data and research sources
- Sources chosen with practicing actuaries and the public in mind



<https://www.soa.org/resources/research-reports/2022/climate-weather-environment/>

## Additional Climate Risk Research and Education

- Series of Reports: Working with Weather Datasets
- Climate Risk Certificate Program



Patrick Wiese, ASA

October 2022

<https://www.soa.org/resources/research-reports/2022/practical-guide-working-weather-datasets/>

### The Society of Actuaries and Milliman Collaborate to Develop First Climate Risk Certificate Program

The newest addition to the SOA's certificate program provides comprehensive professional education on climate risk management and measurement

Schaumburg, IL, and Seattle, WA — October 21, 2022 — The Society of Actuaries (SOA) and Milliman today announced the first certificate program focused on measuring and managing climate risk for actuaries. This Climate Risk Certificate Program pairs the risk management acumen of actuaries with the interdisciplinary expertise necessary to manage the complexity of climate risk.



## SOA U.S. Population Excess Death Analysis

- Covers 2020 and 2021
  - Updates prior analysis released in June 2021
- SOA analysis contains age/sex breakdowns
  - CDC analysis performed across all ages and sexes
- Age/sex results useful for comparisons to insured population results
- Provides educational material on this process
- <https://www.soa.org/resources/research-reports/2022/excess-death-us/>



Additional Life Research



## Experience Studies

Project Name	Objective	Link/Expected Completion Date
2000-2020 U.S. Historical Population Mortality Rates	Publish unsmoothed SSA-Style historical mortality rates for 2000-2020.	<a href="https://www.soa.org/resources/research-reports/2022/us-historical-pop-mort-rates-00-20/">https://www.soa.org/resources/research-reports/2022/us-historical-pop-mort-rates-00-20/</a>
2022 Life Mortality Improvement	Develop AG38 mortality improvement assumptions for YE 2022.	<a href="https://www.soa.org/resources/research-reports/2022/ind-life-mort-imp-scale-2022/">https://www.soa.org/resources/research-reports/2022/ind-life-mort-imp-scale-2022/</a>
COVID-19 Individual Life Mortality Study - Experience Study Report - 3Q 2021	Complete a mortality study assessing the impact of COVID-19 on Individual Life Insurance.	<a href="https://www.soa.org/resources/experience-studies/2022/us-ind-life-covid-mort-q3/">https://www.soa.org/resources/experience-studies/2022/us-ind-life-covid-mort-q3/</a>
COVID-19 Cause of Death Study - 3Q 2021 Update	Publish a cause of death study for individual life insurance.	<a href="https://www.soa.org/resources/experience-studies/2022/cause-death-q3/">https://www.soa.org/resources/experience-studies/2022/cause-death-q3/</a>
COVID-19 Individual Life Mortality Study - Experience Study Report - 4Q 2021	Complete a mortality study assessing the impact of COVID-19 on Individual Life Insurance.	<a href="https://www.soa.org/resources/research-reports/2022/ind-life-covid-mort-4q/">https://www.soa.org/resources/research-reports/2022/ind-life-covid-mort-4q/</a>
COVID-19 Reported Claims Analysis - 1Q 2022	Draft a research study reviewing Covid-19 reported deaths by quarter.	<a href="https://www.soa.org/resources/experience-studies/2022/us-ind-life-covid-rca-q1/">https://www.soa.org/resources/experience-studies/2022/us-ind-life-covid-rca-q1/</a>
Economic Scenario Generator - 2022 Update	Update the AAA Economic Scenario Generator Annually.	<a href="https://www.soa.org/resources/tables-calcs-tools/research-scenario/">https://www.soa.org/resources/tables-calcs-tools/research-scenario/</a>
GRET for 2023	Develop the Generally Recognized Expense Table (GRET) for 2023	<a href="https://www.soa.org/resources/research-reports/2022/2023-gret-recommendation/">https://www.soa.org/resources/research-reports/2022/2023-gret-recommendation/</a>
Group Life COVID-19 Mortality Survey Update - Report	Complete an update on a mortality study assessing the impact of COVID-19 on Group Life Insurance.	<a href="https://www.soa.org/resources/experience-studies/2022/group-life-covid-19-mortality-03-2022/">https://www.soa.org/resources/experience-studies/2022/group-life-covid-19-mortality-03-2022/</a>
Old Age Mortality Study	Analyze old age mortality in the ILEC and possibly other databases and draft a report of the results.	<a href="https://www.soa.org/resources/experience-studies/2022/old-age-mortality/">https://www.soa.org/resources/experience-studies/2022/old-age-mortality/</a>
COVID-19 Cause of Death Study - 2021 Q4 Update	Publish a cause of death study for individual life insurance.	11/30/2022
COVID-19 Reported Claim Study - 2Q 2022 Update	Draft a research study reviewing Covid-19 reported deaths by quarter.	11/30/2022
Group Life COVID-19 Mortality Survey Update - through June 2022	Complete an update on a mortality study assessing the impact of COVID-19 on Group Life Insurance.	11/30/2022
2011-2015 Deferred Annuity Mortality Study	Examine the mortality experience from 2011-2015 in deferred annuity contracts and release a report with the findings and a database with the experience data.	12/16/2022
2014-19 Individual Payout Annuity Experience Study - Report	Examine the mortality experience from 2014-19 under individual payout annuity contracts.	12/16/2022
Life Predictive Mortality Model	The theme is around the sharing and warehousing of PA tools and information, similar to a data science environment.	12/16/2022
US Population Mortality Observations: Updated with 2021 Experience	Explore observations from the release of the 2021 U.S. population mortality data.	1/25/2023



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## Practice Research & Data Driven In-house Research

Project Name	Objective	Link/Expected Completion Date
2021 Emerging Risks Survey-Applicability Report	Provide analysis of the applicability of the 2021 Emerging Risk Survey.	<a href="https://www.soa.org/resources/research-reports/2022/15th-survey-emerging-risks/">https://www.soa.org/resources/research-reports/2022/15th-survey-emerging-risks/</a>
2021 Emerging Risks Survey-Report	Tracks the trends and thoughts of risk managers on emerging risks across time.	<a href="https://www.soa.org/resources/research-reports/2022/15th-survey-emerging-risks/">https://www.soa.org/resources/research-reports/2022/15th-survey-emerging-risks/</a>
2021 US Population Provisional Mortality Results	Review of CDC 2021 Provisional Population Mortality.	<a href="https://www.soa.org/resources/research-reports/2022/2021-provisional-us-pop-mort/">https://www.soa.org/resources/research-reports/2022/2021-provisional-us-pop-mort/</a>
2022 MIM-2021 update (Fall Update)	Update MIM-2021 to address user feedback and to reflect RPEC changes.	<a href="https://www.soa.org/resources/research-reports/2022/mortality-improvement-model/">https://www.soa.org/resources/research-reports/2022/mortality-improvement-model/</a>
Expert Opinion on Impact of COVID-19 on Future Mortality	Survey panel of experts on short and mid term thoughts on future population and insured mortality.	<a href="https://www.soa.org/resources/research-reports/2022/covid-19-short-term-impact-us-mort/">https://www.soa.org/resources/research-reports/2022/covid-19-short-term-impact-us-mort/</a>
Mortality Improvement Trends Analysis	Identify how mortality improvement varies by driver.	<a href="https://www.soa.org/resources/research-reports/2022/mortality-improvement-trends/">https://www.soa.org/resources/research-reports/2022/mortality-improvement-trends/</a>
International Comparison of Regulatory Requirements Study Note, 2021.08	Capital Adequacy Regulatory Requirements in Life Insurance across 4 key models in the US, Canada, EU and Bermuda.	11/15/2022
2022 Mortality Improvement Company Survey	Survey life insurers and annuity companies to see how mortality improvement assumptions have changed in light of COVID.	11/30/2022
Mortality and Mental Illness	Examine the impact on mortality of mental illness during the COVID-19 pandemic.	11/30/2022
Maternal Mortality	Study maternal mortality in US and compare to other countries	12/16/2022
Mortality and Race	Summarize available literature on mortality and race and discuss actuarial aspects.	1/31/2023
Unhealthy Longevity	Examine differences in mortality/longevity between impaired vs healthy lives	1/31/2023



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Dates: Received	Reviewed by Staff	Distributed	Considered
11/18/22	SO		
APF 2022-07			

Life Actuarial (A) Task Force/ Health Actuarial (B) Task Force  
**Amendment Proposal Form**

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

Brian Bayerle, ACLI – Clarification of adjustments to mortality for policies subject to the NPR and for policies that pass the Life PBR Exemption when anticipated experience exceeds the prescribed CSO table.

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:

Valuation Manual (January 1, 2022 edition), VM-20 Section 3.C.1.g, VM-20 Section 6.B.5.d.

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

See attached.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

The purpose of this proposed amendment is to clarify the intent and calculation of the mortality adjustments to the CSO table when anticipated mortality exceeds the prescribed CSO table. The current wording of Section 3.C.1.g has led to confusion by many and a lack of consistent interpretations. The APF does not change the current requirements of VM-20, it only provides clarification. This APF revises the edits made by APF 2018-57.

There are five questions the APF is trying to answer:

1. **What policies are intended to be addressed by Section 3.C.1.g?**

The primary intent of Section 3.C.1.g is to address the higher anticipated mortality for policies that are not subject to full underwriting (FUW), such as simplified issue policies and final expense policies. It is typical for these types of policies to have mortality experience worse than the CSO table, and thus, an adjustment is necessary.

The intent of Section 3.C.1.g. is not to test every possible FUW subset (e.g., attained age blocks, individual underwriting classes with lower credibility, etc.) to determine if its mortality experience is higher than the CSO table even though more aggregate mortality experience is lower than the CSO table. However, if a large, credible block or subset of FUW policies (e.g., a block of FUW business assumed from another company that has significantly different mortality experience than the rest of the assuming company’s FUW business, or a large block of business from an era when the company had significantly more permissive underwriting, etc.) is expected to have worse experience than the CSO table, then the adjustments in 3.C.1.g should be made.

A guidance note has been added following Section 3.C.1.g. to provide this clarification.

2. **What is meant by the current language in Section 3.C.1.g that the “adjustments should be consistent with the adjustments made for the DET Net Premium test” in Section 6.B.5.d?**

This wording has led to a lot of confusion. Some have interpreted this wording to mean that the adjustment factors should be the same as those defined in Section 6.B.5.d. Others have concluded that this means the form of the adjustments should be the same. Others have concluded that this means the same methodology should be used to determine the adjustments. And if the company does not elect to use the DET, there are no adjustment factors to be consistent with.

This APF clarifies that for the group of policies where the DET has been elected, the methodology to test whether adjustments are needed should be consistent with Section 6.B.5.d (that is, using a comparison of the PV of future death claims) and a reasonably consistent approach should be used to determine the adjustment factors). For groups of policies where the DET has not been elected, a reasonably consistent approach should be used.

**3. Are the adjustments to the CSO table in Section 3.C.1.g determined on a seriatim basis or can policies be grouped to determine the adjustments?**

The current wording is not clear as to whether the adjustments are determined on a seriatim basis or grouped basis, resulting in inconsistent interpretations. This APF clarifies that the adjustments to the CSO table for the NPR calculation are to be determined using a group of policies (consistent with the approach used in Section 6.B.5.d), not on a seriatim basis. Since the NPR is calculated on a policy-by-policy basis, the application of the adjustments must be applied to each policy on a seriatim basis, but the factors themselves can be determined using a group of policies.

Determining the adjustment factors on a seriatim basis is inconsistent with determining mortality experience for any other purpose. When data is not credible, the resulting mortality rates may not be smooth or consistent. For example, if the anticipated experience for male age 50 results in an adjustment factor of 1.3, but the adjustment factor for male age 48 is 2.1 (based on limited non-credible data), this results in the mortality rate for male 48 being higher than the rate for male 50.

This APF clarifies that the determination of the adjustment factors in Section 3.C.1.g. is to be done on a grouped basis. However, similar to the DET requirement, a company may not group together policies with significantly different risk profiles.

**4. How do the requirements of Section 3.C.1.g apply to policies that pass the Life PBR Exemption?**

Policies that pass the Life PBR Exemption are still subject to the requirements of Section 3.C.1 (per Section II.G.4 of the Valuation Manual). But Section 3.C.1.g includes references to the NPR and the DET which do not apply to these policies. To clarify, section 3.C.1.g. has been split into two sections: 1) policies that pass the Life PBR Exemption and 2) policies that are not utilizing the Life PBR Exemption and are subject to the NPR requirements. For policies that pass the Life PBR Exemption, all references to the NPR and DET have been removed.

**5. How do the requirements in Section 3.C.1.g. apply when calculating deficiency reserves?**

Policies that pass the Life PBR Exemption still must determine deficiency reserves, which has led to confusion on how the requirements of section 3.C.1.g apply when determining deficiency reserves. Section 3.C.1 is based on the basic reserve calculation (Section 3.B.6). Once the valuation mortality rates have been adjusted (if needed) by Section 3.C.1.g for the basic reserve, then the calculation of X-factors for the deficiency reserve follows the normal approach as described in VM-A and VM-C. This APF clarifies that the mortality adjustment in 3.C.1.g only applies to the basic reserve for policies that pass the Life PBR Exemption, and not the deficiency reserve.

Deficiency reserves are not needed for policies that are not utilizing the Life PBR Exemption. The NPR for policies other than term and ULSG equals the basic reserve defined in VM-A and VM-C, the NPR for term and ULSG follow the requirements of Section 3.4 and 3.5, and the DR and SR calculations already reflect the circumstances that give rise for the need for a deficiency reserve.

## Section 3: Net Premium Reserve

### C. Net Premium Reserves Assumptions

- 1.g For a group of policies where the anticipated mortality experience exceeds the prescribed CSO mortality rates determined in Section 3.C.1.a through 3.C.1.d above, the company shall adjust the CSO mortality rates as follows:
- i. For policies that pass the Life PBR Exemption, the CSO mortality rates used to determine the basic reserve for each policy shall be adjusted in a manner commensurate with the anticipated mortality experience for the policies. The methodology used to test whether adjustments are needed can be performed on an aggregate basis for the group of policies using a reasonable method to compare the respective mortality rates, such as comparing the present value of future death claims discounted at the valuation interest rate used for VM-A and VM-C. However, for the purposes of this comparison, a company may not group together policies with significantly different risk profiles. If an adjustment is needed, the determination of the adjustment factors should use a reasonable methodology, subject to a cap that ensures that mortality rates do not exceed 1,000 per 1,000.
  - ii. For policies where the Life PBR Exemption is not utilized, the CSO mortality rates used in the NPR calculation shall be adjusted in a manner commensurate with the anticipated mortality experience for the policies.
    - a) When the company elects to use the DET in Section 6.B for a group of policies, the methodology used to test whether adjustments are needed should be consistent with the methodology used in Section 6.B.5.d (that is, using a comparison of the PV of future death claims discounted at the valuation rate used for the NPR). For the purposes of this comparison, a company may not group together policies with significantly different risk profiles. If an adjustment is needed, the determination of the adjustment factors should use a reasonably consistent methodology to the one used in Section 6.B.5.d., subject to a cap that ensures that the mortality rates do not exceed 1,000 per 1,000.
    - b) For the group of policies where the DET is not used, the company should use a reasonably consistent approach to the one described in paragraph a) above to test whether adjustments are needed and to determine the adjustment factors. The resulting adjustment factors are not required to be identical to the adjustment factors determined in paragraph a) above.

The resulting NPR must not be lower than the NPR calculated without adjustments to the CSO mortality rates.

**Guidance Note:** It is anticipated that the 3.C.1.g adjustments are generally applicable but not limited to policies with limited underwriting, such as simplified issue or final expense. The intent of Section 3.C.1.g. is not to test every possible group of policies ~~FUW subset~~ (e.g., attained age blocks, individual underwriting classes with lower credibility, etc.) to determine if its mortality experience is higher than the CSO table even though more aggregate mortality experience is lower than the CSO table. However, if a large, credible block or group of policies ~~subset of FUW policies~~ (e.g., a block of ~~FUW~~ business assumed from another company that has significantly different mortality experience than the rest of the assuming

company's ~~FLW~~ business, or a large block of business from an era when the company had significantly more permissive underwriting, etc.) is expected to have worse experience than the CSO table, then the adjustments in 3.C.1.g should be made.

## **Section 6: Stochastic and Deterministic Exclusion Tests**

### **B. Deterministic Exclusion Test (DET)**

- 5.d. If the anticipated mortality for the group of policies exceeds the prescribed CSO mortality rates for the NPR determined in Section 3.C.1.a through 3.C.1.g, then the company shall use anticipated mortality to determine the valuation net premium. For this purpose, mortality shall be measured as the present value of future death claims as of the valuation date discounted at the valuation interest rate used for the NPR.

**Brian Bayerle**  
Senior Actuary

**Colin Masterson**  
Policy Analyst

September 22, 2022

Rachel Hemphill  
Acting Chair, NAIC Life Actuarial Task Force (LATF)

Re: APF 2022-07

Dear Ms. Hemphill:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit feedback on the exposed APF 2022-07 proposing a clarification of adjustments to mortality for policies subject to the NPR and for policies that pass the Life PBR Exemption when anticipated experience exceeds the prescribed CSO table.

ACLI is open to pursuing regulators' suggestions to simplify the APF and "de-link" the approach used for the NPR and the DET as discussed during the LATF meeting on September 8, 2022. We would also like to express our interest and willingness to work with regulators on drafting the language that would allow for this simplification to occur.

Thank you for your consideration,



*Colin Masterson*

cc: Scott O'Neal, NAIC

American Council of Life Insurers | 101 Constitution Ave, NW, Suite 700 | Washington, DC 20001-2133

The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 94 percent of industry assets in the United States.

Date: September 12, 2022

Virginia is submitting comments regarding the following exposure:

**APF 2022-07 (Clarify NPR Mortality Adjustment)**

**Comments:**

1. In the opening paragraph in Section 3.C.1.g, the phrase “prescribed CSO mortality rates” is not entirely accurate because the CSO rates may have been adjusted as specified in Section 3.C.1.e and Section 3.C.1.f. Therefore, I suggest the following revised wording:

For a group of policies where the anticipated mortality experience materially exceeds the prescribed CSO mortality rates determined in Section 3.C.1.a through 3.C.1.d above, adjusted as necessary pursuant to Section 3.C.1.e and Section 3.C.1.f, the company shall adjust/further adjust the CSO mortality rates as follows:

2. In Section 3.C.1.g.ii, the word “policies” is incorrectly shown to be changed to the word “policy” when the current version of VM-20 already has the word “policy”. However, the word “policy” should be changed to “policies”, as follows:

“...manner commensurate with the anticipated mortality experience for the policiespolicy, subject to a cap...”

3. In the Guidance Note, I believe “FUW” is an acronym for “fully underwritten”. In the way “FUW” is used in this Guidance Note, it appears to distinguish from guaranteed issue business since the FUW category includes policies with limited underwriting. “FUW” should be changed to “fully underwritten” for clarity since “FUW” does not appear anywhere else in VM-20 and is not defined. Or perhaps, a better approach, would be to use “non-guaranteed issue”, since the phrase “fully underwritten” may not be entirely accurate when describing policies with limited underwriting, such as simplified issue.
4. In Section 6.B.5.d, the phrase “prescribed CSO mortality rates” is not entirely accurate because the CSO rates may have been adjusted as specified in Section 3.C.1.e and Section 3.C.1.f. Therefore, I suggest the following revised wording:

If the anticipated mortality for the group of policies exceeds the prescribed CSO mortality rates for the NPR determined in Section 3.C.1.a through 3.C.1.d, adjusted as necessary pursuant to Section 3.C.1.e and Section 3.C.1.f valuation

mortality, then the company shall use ~~the~~ anticipated mortality to determine the valuation net premium. For this purpose, mortality shall be measured as the present value of future death claims as of the valuation date discounted at the valuation interest rate used for the NPR.

Thank you for your consideration of these comments.

Craig Chupp, FSA, MAAA  
Life and Health Insurance Actuary  
Virginia Bureau of Insurance  
[craig.chupp@scc.virginia.gov](mailto:craig.chupp@scc.virginia.gov)  
Phone: (804) 382-3196





**NAIC**  
**NATIONAL**  
**MEETING**  
**FALL 2022**  
**TAMPA**

**Summary of Company Responses to the Economic Scenario Generator (ESG) Qualitative Survey**

Pat Allison, FSA, MAAA  
Scott O'Neal, FSA, MAAA

December 12, 2022

NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

**NAIC** NATIONAL MEETING FALL 2022

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## I. Purpose

This presentation has several purposes:

- To provide qualitative information that may aid in understanding and interpreting quantitative field test results to be presented later
- To support the work of the newly formed VM-20/VM-21 ESG Drafting Group on topics that were not fully addressed prior to the field test. To facilitate this, comments are broken out by topic such as scenario subset selection methodology, SERT scenario methodology, etc.
- To support the work of the newly formed ESG Governance Drafting Group, by summarizing company comments related to this topic
- To summarize company comments relating to future ESG development and a 2<sup>nd</sup> field test

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## II. Limitations

- This summary relies on information submitted by companies in response to the ESG Qualitative Survey. It is intended to be based on a clear read of the responses, but there is some risk of misinterpretation.
- Survey responses received by 11/29/22 are summarized in this presentation. One participant has not yet responded to the survey or provided quantitative results.
- This presentation summarizes many, but not all survey responses. Explanations of reserve and RBC changes between field test and baseline runs (VA questions 10 and 11) will be summarized and presented with quantitative field test results.
- This presentation does not follow the organization of the questions in the survey. To improve the useability for future ESG development and analysis, responses were grouped by topic, regardless of where they appeared.
- Some survey questions were not entirely clear, so follow-up questions will be sent to participants.

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## III. Notice Regarding Confidentiality

- This presentation provides a summary of company responses to the Economic Scenario Generator (ESG) Qualitative Survey, which was part of the ESG field test conducted from 6/1/22 through 11/29/22. This survey is publicly available here (<https://naic.conning.com/scenariofiles>).
- The survey information was requested from field test participants under both the authority of the general examination authority of the Texas Department of Insurance pursuant to Tex. Ins. Code §§ 401.051, et seq., and the Standard Valuation Law, Tex. Ins. Code §§ 425.051, et seq., and is considered to be confidential under these provisions. These provisions also permit the Texas Department of Insurance to share this confidential information with other state regulators and the NAIC, including the Life Actuarial (A) Task Force (LATF), the Life RBC (E) Working Group, the Valuation Analysis (E) Working Group (VAWG), and NAIC staff. Company specific information will remain confidential pursuant to these statutory provisions.
- This presentation does not contain any company-specific or other company-identifiable information, and any information contained herein has been aggregated or edited as needed in order to protect the confidentiality of the information.

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## IV. Background

- A. Survey Participation
- B. Characteristics of Baseline Run
- C. Inforce File Adjustments

### IV.A. Survey Participation

Nearly all field test participants provided responses to the survey. The table below shows the number of respondents for each section.

Survey Section	Number of companies
VM-21 and C3 Phase II	31
VM-20	15
C3 Phase 1	25
All Products	39
Total Respondents	40 out of 41 participants

- Responses to survey questions provided information aiding in the ongoing review of quantitative field test results. Many companies also provided comments on topics not specifically addressed in the survey.
- Some companies left certain survey questions blank because they did not have enough time or resources to fully analyze field test results.

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## IV.B. Characteristics of Baseline Run

(i.e. actual 12/31/21 reported results)

Framework	Valuation Dates Used for Baseline Runs	Baseline and Field Test Scenario Subsets		Was a proprietary ESG used for the Baseline Runs?	
<b>VM-21 and C3P2</b>  31 companies	12/31/21	<u>Scenarios</u>	<u># Companies</u>	<u>Response</u>	<u># of Companies</u>
		1,000	25	Yes	5*
		>1,000	2	No	26
		<1,000	2		
		Inconsistent	2		
<b>VM-20</b>  15 companies	14 used 12/31/21  1 company submitted SERT only using 9/30/21	<u>Scenarios</u>	<u># Companies</u>	One company used a proprietary ESG for the Baseline runs.	
		1,000	7		
		200	4		
		Inconsistent	1		
		N/A	3**		
<b>C3 Phase 1</b>  25 companies	12 used 12/31/21	<ul style="list-style-type: none"> <li>5 companies used 200 scenarios for Baseline and Field Test runs</li> <li>20 companies used 50 scenarios for Baseline and 200 for Field Test runs</li> </ul>		N/A	
	13 used 9/30/21				

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\* Most used modified versions of the AIRG (with different changes)

\*\* (SERT passed or only SERT was submitted)

## IV.B. Characteristics of Baseline Run (cont.)

### Survey Question

Baseline #1 should match what was reported in the VA Supplement/VM-20 Reserves Supplement. Is this the case?

Response	VM-21	VM-20	Total
Yes	16	6	22
No	15	8	23
N/A (only SERT submitted)	N/A	1	1
Total responses	31	15	45

“No” responses seemed acceptable for 11 VA participants and 6 VM-20 participants, with mismatches typically occurring due to exclusion of immaterial blocks of business, restatement of the Baseline (e.g. to reflect modeling enhancements or additional business that should have been included in the Supplement), or exclusion of topside adjustments.

- Baseline results do not appear reasonable for some companies, so we will be comparing against the Supplement and following up with companies as needed.

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## IV.C. Inforce File Adjustments

### Survey Question

If the inforce files were adjusted for the field test runs, describe the changes that were made.

### Field test instructions regarding adjustments

- For runs where the starting yield curve for the Treasury model is set to the 12/31/19 level plus 200 BP, participants may need to make appropriate adjustments to their 12/31/21 inforce assets and/or liabilities.
- The field test does not require that participants perform these adjustments in a certain fashion, rather, it is expected that participants will take advantage of existing processes for starting yield curve sensitivities.
- Some participants may elect to enter the 12/31/21 yield curve at time zero for these runs followed by the relevant 12/31/19 + 200 BP scenario data to allow their models to make these adjustments. Other participants may make specific adjustments to their inforce assets and/or liabilities as appropriate. Other methodologies may also be appropriate.

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## IV.C. Inforce File Adjustments (continued)

### Survey Question

If the inforce files were adjusted for the field test runs, describe the changes that were made.

Responses	Number of companies
No adjustments or N/A	23
No response or unclear response	6
Inforce adjustments were made	10
Total companies	39

- Companies that made inforce adjustments used a variety of approaches.
  - We will be following up with companies that did not make inforce adjustments or did not respond to determine if this could materially impact results.

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## V. Modeling and Assumption Changes

- A. Changes Made for Negative Interest Rates
- B. Other Modeling and Assumption Changes
- C. Fund Mapping Changes

### V.A. Changes Made for Negative Interest Rates

The field test instructions included the following guidance regarding negative interest rates:

- The two ESG Treasury models used for the field test include scenarios with negative interest rates, so companies will need to consider whether any modeling or assumption changes are needed to handle this. It is recommended that companies read and consider the information in the paper below:

[Potential Modeling Challenges in a Negative Interest Rate Environment](#)

Author: Zohair Motiwalla, FSA, MAAA

Principal and Consulting Actuary, Millima

- For purposes of the field test, companies may make assumption changes as appropriate to reflect negative interest rates, but this is not required given the amount of time this may take.

## V.A. Changes Made for Negative Interest Rates (continued)

### Survey Question

Did the company make any changes to assumptions or modeling approach for the field test runs because the ESG produces negative interest rates? If so, describe the changes that were made. If not, describe changes anticipated when the new ESG is adopted.

### Participant Responses

- Most companies responded that no changes were made for negative interest rates, and no changes are anticipated when the ESG is adopted.
  - It is unclear whether the potential modeling changes cited in the Milliman paper were considered.
  - Some companies stated that no changes are necessary because their models can handle negative interest rates. However, the question didn't specifically ask about modeling capability and most companies were silent on this.
- Responses indicated that some companies did not model negative interest rates for the field test, or they made other modifications to the scenarios.

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## Follow-Up Questions on Negative Interest Rates

- We will be asking field test participants these follow-up questions:
1. Does your modeling software appropriately handle negative interest rates?
  2. Were the field test scenarios used as is?
  3. If the field test scenarios were modified in any way, please describe the changes that were made.
  4. Did you consider potential assumption and modeling changes that may be necessary due to negative interest rates (see Milliman paper cited in the field test instructions)?
  5. Do you anticipate that any changes cited in the Milliman paper would materially impact your results?

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## V.B. Other Modeling or Assumption Changes

### Survey Question

Were any other changes to assumptions or modeling made for the field test runs?

Response	VM-21 and C3P2	VM-20
Yes	4	1
No	27	14
Total companies	31	15

For companies that responded “Yes”, fund mapping and/or various simplifications were cited.

## V.C. Fund Mapping Changes

### Survey Question

If the fund mapping for the field test scenarios had to change from what was included in the ESG used for reporting, please describe the new fund mapping and why it was necessary. Note: The field test instructions asked companies not to change fund mapping unless necessary.

Response	VM-21 and C3P2	VM-20
No change or N/A	27	13
Changes were made	3	0
No response	1	2
Total companies	31	15

- Few companies made changes to fund mapping. Those that did cited the desire to replace the AAA aggressive equity with GEMs NASDAQ and EM indices, or the need to map the GEMs indices to proprietary funds.

## V.C. Fund Mapping Changes (continued)

### Survey Question

Would your company need to create a more refined mapping to equity and bond funds given the expanded set of returns offered by the GEMS ESG? If yes, please provide a quantitative or qualitative explanation of how it might impact your results.

Responses	Number of companies
No	14
Yes/Maybe	11
No response or N/A	10
Equity and bond funds are out of scope	3
Unclear response	1
Total companies	39

Companies have not determined the impact of fund mapping changes on results.

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## V.C. Fund Mapping Changes (continued)

Companies that would consider fund mapping changes noted that additional analysis will be needed in the following areas:

- Review of consistency with scenario generators employed for other use cases
- Review of metrics/indices currently used in the company’s hedging programs.
- Characteristics such as volatility, correlation, credit quality, duration, etc.
- Whether this would better align the VA model projections to best estimates, given the potential for improvements to the fund mapping correlation results
- Whether there is industry evidence that a further refined mapping gives substantially more meaningful results that assist in risk management. This would be needed to justify the increased runtime from expanding the number of fund indices in the mapping.

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# VI. Hedging (VA Only)

## A. Hedging Methods

## B. Hedge Effectiveness

**NAIC** NATIONAL MEETING FALL 2022

### VI.A. Hedging Methods

Survey Questions  
 Did you use an implicit method or explicit method to model hedging? If implicit, have you reassessed whether it is still appropriate in light of the field test scenarios?

Responses	Number of companies
Implicit	8 (Half have reassessed appropriateness)
Explicit	9
Did not model hedging	10
Other (please explain)	4 (runoff of existing hedges, or index credit only)
Total companies	31

➤ For companies that did not model hedging, it is unclear whether they do not hedge, or whether they are modeling the runoff of existing hedges. This is being reviewed.

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## VI.B. Hedge Effectiveness

### Survey Question

Did the new ESG impact hedge effectiveness?

Responses	Number of companies
N/A or no response	14
No	11
Yes	4 (all use the explicit hedging method)
Not measured; more information needed	2
Total companies	31

Survey responses included company-specific comments regarding hedging which will be used in the analysis of quantitative field test results.

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## VII. Capturing Potential Impact of Scenarios on Results

- A. Comments on Sensitivity Tests and Custom Scenarios
- B. Availability of Conning API Tool

## VII. Capturing Potential Impact of Scenarios on Results

### Survey Question

To what extent did the field test capture the potential impact of the scenarios on results? Were there areas that could not be assessed (e.g. due to the need for additional scenario sets, new or existing simplifications)?

Responses	Number of companies
Potential impact was captured well	9
Potential impact was captured well with some simplifications	6
Suggestions for improvement were provided in response to this question*	14
No response, N/A, or unclear response	10
Total companies	39

\*Many participants provided suggestions, although not necessarily in response to this particular question. Suggestions are grouped by topic in this presentation.

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## VII.A. Comments on Sensitivity Tests and Custom Scenarios

Approximately 25% of VA participants said they would like more sensitivity tests and/or the ability to generate custom scenario sets to perform additional analysis.

### Company Comments

- We need the ability to run interest rate sensitivities to assess current hedge strategy when interest rate risk profiles with respect to RBC appear to have changed significantly. While we gain a small amount of insight from the single interest rate sensitivity included in the field test, it is insufficient to understand the interest rate risk profile. Parallel and symmetrical interest rate sensitivities (e.g. +/-25bps; +/-100bps; +200bps) would be more productive toward building this understanding.
- Testing was limited by only having published test scenario sets without the ability to generate our own. The ability to generate scenarios is necessary to test potential impacts at future points in time and for new product pricing.

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## VII.A. Comments on Sensitivity Tests and Custom Scenarios (continued)

- Lack of the access to the source code doesn't allow testing of customized initial condition shocks and other capital stress tests.
- Granting field test participants at least partial access to the GEMS tool would allow us to run additional tests that would deepen our understanding of the impacts on our reserves and capital and give us more confidence on the path forward. Given the inability to create custom scenarios, we were unable to test impacts to SSAP108 processes and other sensitivity analysis we typically perform. Lack of autonomy over the scenario generation process will also cause additional logistical and technical barriers to deeper reserve and capital analysis in the future.
- Scenario sets were not provided to test the following: typical rate sensitivities such as parallel shocks and key rate duration sensitivities; potential ORSA, forecast, or pricing impacts; alternative investment and/or hedging strategies; field test run 6 with the 12/31/2019 +200bps starting rate environment, which would have given a useful comparison point to 1a/2a, 1b/2b, 5a/5b.

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## VII.B. Availability of Conning API Tool

- Conning's API tool is available to software clients for no additional charge and non-clients free of charge under a 90-day software evaluation agreement.
- The API tool allows companies to create custom scenario sets and test different calibrations of the Conning ESG.
- Companies can contact Conning for assistance in installing the API tool.

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## VIII. Participant Comments by Topic

- A. Scenario Subset Selection Methodology
- B. Linkage Between Interest Rates and Equity Returns
- C. SERT and Deterministic Reserve Scenarios
- D. ESG Calibration
- E. Acceptance Criteria

### VIII.A. Scenario Subset Selection Methodology

Some companies commented on limitations of the AIRG subset selection methodology. (The field test scenario subsets were created using the AIRG methodology).

#### Company Comments

- The current AIRG picking tool relies on the 20 yr UST for scenario selection so it's not particularly effective at selecting subsets of scenarios for products that are sensitive to equity performance or other Treasury maturities. If the published subsets from the proposed generator are selected in the same manner, it will have a similar issue of not being effective at selecting subsets for products sensitive to equity markets.
- Scenario subset selection methodology will distort the impact from business where equity returns are a major driver (i.e. VM-21 business, VUL business in VM-20). A comparison of the equity return distribution for the full 10,000 scenarios vs. the 1,000 scenario subsets shows material differences in the equity return distribution since scenario subset selection was stratified on interest rates only and changes between runs.

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## VIII.A. Scenario Subset Selection Methodology (continued)

### Company Comments

- The most extreme scenarios were not often making it into the scenario subsets, which may cause misestimation of impacts for high CTE levels (i.e. VM-21/C3P2 CTE98).
- For the variable annuity field tests, differences in equity scenarios impacted results of all field test runs because each scenario set represented a different subset of 1,000 equity scenarios. The VM-21 and C3 Phase II results may be misleading as the equity scenario sets were not consistent.

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## VIII.A. Scenario Subset Selection Methodology (continued)

Approximately 25% of VA participants indicated the AIRG scenario picker tool was not used for Baseline reported results.

### Company Comments

- The company selected a scenario subset for Baseline reported results using their own methodology.
- A VM-20 scenario selection based solely on interest rates may not be appropriate for a heavily equity sensitive liability, is not required by VM-21/C3P2, and is not used in our actual reporting.
- A parameter release would be ideal for each set, including a significance value/ranking for each scenario based on the picking methodology, and significance values/ranks for some other metrics (e.g. S&P total return, shorter interest rate tenors). This could allow companies to select different subsets based on product (i.e. remove the burden from companies to develop alternative scenario picking measures/methodologies for different products, e.g. VA, to have subsets that are representative of the full distribution).

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## VIII.B. Linkage Between Interest Rates and Equity Returns

Approximately a third of participants commented on the ESG's linkage between interest rates and equity returns.

### Company Comments

- The constant mean Equity Risk Premium should be removed from the scenarios and replaced with a constant mean return (inverse ERP) relationship. The constant mean ERP simplification is not supported by historical experience, economic theories/models like the Dividend Discount Model, or the Fed's use of monetary policy where we can see that equity risk premium contracts when rates rise and expands when rates fall.
- We believe the direct linkage between interest rates and equity returns is a non-standard practice and conflicts with observed historical metrics. Changing to a more realistic linkage would be desirable.
- We suspect the link between the treasury rates and the gross wealth ratios is too strong.

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## VIII.B. Linkage Between Interest Rates and Equity Returns (continued)

- These scenarios appear to be significantly worse than historical experience would suggest is likely in a moderately adverse environment. The equity returns are lower than historical average returns, and interest rates remain below historical minimum rates for significant periods of time in a high percentage of scenarios. The correlation between equity returns and rates, while theoretically sound, appears to compound the issue and results in a significant number of tail scenarios that are beyond moderately adverse.
- We would like to further explore the equity / interest rate linkage within the equity models, as we were not fully satisfied with the calibration of the baseline equity model used in 1a/1b/2a/2b. Specifically, we noticed that the gross wealth ratios in 1a vs. 2a produced unintuitive results in the tail – in shorter durations, 2a produced higher equity returns than 1a, but in longer durations this relationship didn't hold.

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## VIII.B. Linkage Between Interest Rates and Equity Returns (continued)

- A desirable property is that equity returns should not be closely correlated to short term treasury rates. Such a relationship is not supportable by historical data. The calibrated gross wealth factors should align more closely with those produced by the AIRG Equity model, which the company thinks is more reasonable.
- The constant mean ERP may lead to more aggressive scenarios and lower TAR. For example, the risk of high interest rates combined with low equity returns may be understated. High rates can cause hedge losses and for some products can cause disintermediation risk.
- The relationship between interest rates and equity returns would make attribution of changes in results from period to period difficult to perform and understand. If interest rates rise and this affects the distribution of equity returns along the projection in the next period results, it makes attribution between interest rate and equity changes difficult to separate, explain, and understand. The ability to construct clear attributions is important for companies to understand how emerging risks impact their business and to be effective in managing them.

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## VIII.C. Stochastic Exclusion Ratio Test (SERT) Scenarios

Approximately a third of the VM-20 participants commented on the SERT scenarios.

### Company Comments – SERT Methodology

- The methodology for creating SERT scenarios for interest rates seems inconsistent with the AIRG approach and creates significantly more extreme scenarios. The scenarios seem more consistent with an approach of calculating the applicable percentiles for each individual time period (e.g. the 10th percentile of rates in each individual year). The AIRG approach is more consistent with calculating percentiles based on aggregate results up to and including the period. We would recommend reviewing this methodology to validate alignment with the AIRG methodology.
- We need a better description of how the SERT scenarios are being calibrated in the different Tests. Field Test 1b has a peculiar jump at the start of the projection. The Generalized Fractional Floor calibration technique results in dramatically low rates for SERT Scenario 4. We need to understand these relationships better and understand how the SERT scenarios would change in different interest rate environments.

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## VIII.C. Stochastic Exclusion Ratio Test (SERT) Scenarios (continued)

### Company Comments – Whole Life SERT Failures

- For most scenarios there was a large increase in the calculated SERT volatility even for conservatively priced whole life products. This was driven by SERT scenarios that are very extreme relative to history and seem beyond a moderately adverse standard. As an example, SERT scenarios 3 & 4 for scenario set 1a has the 10- year Treasury Rate drop below the historical minimum and remain around the historical minimum range (35 – 65 bps) for the full 100 years.
- The combination of conservative calibration and change in SERT methodology results in participating whole life failing SERT. Due to the wider dispersion of scenarios and their impact to the net asset earned rates, the ratios exceed 6% in some scenario sets. This is inappropriate given the participating nature of the product and general conservatism that goes into pricing. The SERT scenarios (particularly the low-rate scenarios such as pop down, low equity) reflect conservatism beyond what one would expect in moderately adverse scenarios used for reserving.

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## VIII.C. Stochastic Exclusion Ratio Test (SERT) Scenarios (continued)

### Company Comments – Term SERT Failures and 6% Threshold

- For Term business, the SERT passes under certain scenarios with the new calibrations but fails under others. We want to further explore this and perhaps should revisit the 6% threshold. We expect that this business should pass the SERT.
- If due to the calibration and/or methodology changes the SERT scenarios are ultimately going to reflect such a large increase in the severity of interest rate sensitivities, we would recommend the 6% threshold and deterministic reserve scenario description be revisited to ensure they remain consistent with the original intention and range of risks intended to be captured.

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## VIII.C. Stochastic Exclusion Ratio Test (SERT) Scenarios (continued)

Approximately half of VM-20 participants provided these comments on the DR scenario:

- Introducing a stochastic element to the DR scenario caused volatility in the path of equity returns vs. the AIRG which could lead to volatility in reserves quarter to quarter.
- The DR scenario is overly conservative. We suggest developing this scenario separately from the GEMS scenario generator.
- We recommend revisiting the DR scenario description to ensure it remains consistent with the original intention and range of risks intended to be captured.
- For DR, we're probably not seeing the full potential impact of interest rate differences between scenario sets. At this point in the product life cycle (all PBR business is issued since 2017) we're currently most sensitive to long maturity rates (e.g., 20Y and 30Y UST) while scenario differences are most pronounced for short and medium maturities.

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## VIII.C. Stochastic Exclusion Ratio Test (SERT) Scenarios (continued)

Issues with Certain Field Test SERT Scenario Sets:

- After feedback from field test participants, it was determined that there were issues with the Stochastic Exclusion Ratio Test (SERT) scenario sets listed below. Field test participants have been notified of the issue.
- Corrected versions of the SERT scenario sets have been posted on the NAIC/Conning scenario [website](#). The original erroneous sets are also available, with the label of "FOR\_REFERENCE\_ONLY\_ORIGINAL" at the start of the start of the filename
- The NAIC is not asking participants to redo the affected SERT scenario runs. Participants that wish to provide results with the corrected SERT scenarios should contact [Scott O'Neal](#).
- SERT Scenario Sets with Issues:
  - SERT\_Scenarios\_1b\_Alt\_Shdw\_Baseline\_Equity\_093021
  - SERT\_Scenarios\_2a\_Conning\_GFF\_Baseline\_Equity\_123119Up200BP
  - SERT\_Scenarios\_Set\_5a\_Conning\_GFF\_Conning\_Equity\_123121
  - SERT\_Scenarios\_Set\_5a\_Conning\_GFF\_Conning\_Equity\_093021
  - sert\_scenarios\_set\_5b\_conning\_gff\_conning\_equity\_123119up200bp
  - SERT\_Scenarios\_Set\_5b\_Conning\_GFF\_Conning\_Equity\_123119Up200BP
  - SERT\_Scenarios\_6\_Conning\_GFF\_ACLI\_Equity

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## VIII.D. ESG Calibration - Low and High Interest Rates

Many companies provided comments on ESG calibration:

- The current calibration of stochastic scenarios is too conservative, with too many low-for-long and high-for-long scenarios. Boundary guidance previously adopted by LATF is exceeded (i.e. beyond the old AXXX level of ULSG reserves).
- We are concerned about the diverging nature of the interest rate distribution where both low and high rates in the tails reach some unreasonable values.
- The alternative calibration with the shadow floor produced more reasonable results than the generalized fractional floor, although we would be interested in testing a calibration that has less extreme high interest rates.
- Earlier yield reversion to the mean is recommended in the Treasury model.

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## VIII.D. ESG Calibration - Negative Interest Rates

- The frequency and severity of negative interest rate scenarios seems quite extreme and out of sync with history and sound economic theory. A disproportionate weighting to an environment that has yet to materialize seems unnecessarily conservative and could strain the VA industry with unnecessarily high capital/reserve requirements.
- Long-dated liabilities are subject to more exposure to unprecedented and prolonged low and negative rates in the current format. Negative interest rates in short duration tenors are more prevalent than expectations and are overweighted in the C3 calculation.
- Reduce the frequency and severity of negative rates and reflect structural differences between different economies.
- Negative rates were not a large driver of observed impacts, but the frequency at which negative rates are produced is considerably higher than expectations. We would recommend additional focus on interest rate model calibration.

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## VIII.D. ESG Calibration - Interest Rate Floor and Yield Curve Shapes

- The interest rate distribution from the underlying model seems extreme, leading to a very high percentage of scenarios being impacted by the floor. It would be preferable to adjust the model structure/calibration directly.
- We have concerns regarding the large number of scenarios that are floored due to the high prevalence of negative rates, differences in the amount and severity of various yield curve shapes relative to history, and the amount and severity of extreme equity scenarios in some of the calibrations.
- Yield curves that are inverted 15% of the time, sometimes by more than 100 bps and for 40+ years straight, do not align with historical data or intuition.
- Allow for more appropriate relationships between maturities (spreads and volatilities) and address overly frequent, severe, and prolonged rate curve inversions. These relationships could skew hedging results or disincentivize ALM matching.

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## VIII.D. ESG Calibration - Volatility

- The field test scenarios produce volatile results to different starting interest rates that can lead to low reserves and capital when rates rise as can be seen in field test runs 2a, 2b, and 5b. We are experiencing rising rates in 2022 with rates up significantly since 12/31/21 so the field test scenarios could lead to low reserve and capital levels as well as volatile balance sheets when markets move.
- Look at scenario behavior over a wider range of sensitivities to starting conditions and changes to long-term targets (e.g. higher / lower interest rate mean reversion target) to get a better sense of potential volatility.

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## VIII.D. ESG Calibration - Equity Model

- The jump diffusion feature of the model is a reasonable addition that captures a real risk observed in equity markets. However, the parameters are set such that the jumps are not particularly large and are frequent. This has the effect of simply creating a second source of 'traditional' volatility rather than capturing jump risk as originally intended. The ACLI calibration is parameterized in such a way that these jumps are less frequent and more severe, which better reflects the original intention of adding the jumps to the model.
- Adopt equity jump and mean reversion of equity vol parameters that are more consistent with historical data. This is already in Scenario Set #6 but not the others.
- The AAA equity scenarios have a desirable property of remaining unchanged month-over-month. This enhances the ability to analyze/compare scenario results from period to period.

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## VIII.D. ESG Calibration - Other Comments

- It is desirable to have a scenario distribution that aligns with actual expectations for the probability of future events; however, the field test distributions have overweighted the tail scenarios relative to our expectations. If the tails of the distribution are not reflective of the true probability of such economic events occurring, models could produce distorted measurements of risk and the costs/benefits of hedging.
- Address the overconcentration of the rate distributions (particularly for short maturities) at or below worse-than-history levels. There should be some scenarios that are worse than history, but it doesn't make sense for ~25%-30% of the stochastic scenarios to be worse or for VM-20 DR to always drop to worst-in-history levels.
- The field test scenario distribution is more extreme than the AAA scenarios, which may imply that a lower CTE level should be considered for C-3 Phase II. During VA Reform, CTE98 was recommended in conjunction with the AAA ESG, but CTE95 was recommended with an alternative, more severe scenario set.

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## **VIII.E. Acceptance Criteria**

- We recommend that the NAIC continue the recent work to develop a comprehensive set of stylized facts and acceptance criteria based on these stylized facts. Acceptance criteria can then be used to calibrate a scenario set that may represent a better balance of the desired outcomes for a scenario set to be utilized for life and annuity reserves and capital.
- In developing acceptance criteria for interest rates, the frequency and severity of negative rates are key metrics to include. Reporting on each scenario set should be done on a pathwise as well as point in time basis.
- Distributions of gross wealth factors at different percentiles and time horizons should be a key focus for equity and credit funds on a price and total return basis. Focus on the severity of the tail of the equity distribution as this is a meaningful contributor to results for multiple products. Also focus on relationships of gross wealth factors between different indices, e.g. S&P vs. other indices since refinements may be needed in future iterations.

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## **IX. Participant Comments Relating to a 2nd Field Test**

- A. Field Test Starting Conditions
- B. Attribution Analysis
- C. Other Field Test Considerations



## **IX.A. Field Test Starting Conditions - Interest Rates**

- Both 2019 and 2021 are periods following a prolonged low interest rate environment. The historical data used by the model is similar and it results in similar patterns in the generated scenarios. It remains unknown how the proposed model will respond to changing interest rate environments.
- It would be helpful for companies to understand what the scenarios look like under different starting market conditions. This could include interest rate and volatility shocks as well as changes to long term assumptions such as mean reversion parameters.
- While rates were already historically low as of 12/31/2021, reflecting a lower or even negative rate environment as of the valuation date may be useful in future iterations.

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## **IX.A. Field Test Starting Conditions - Interest Rates (continued)**

- Scenario sets should be provided to test lower initial interest rate conditions to assess their overall impact on results, including the differences between Generalized Fractional Floor and Shadow Flooring methodologies and impact on equity returns.
- Tests for sensitivity to changes in the starting yield curve should include an inverted starting yield curve.
- Field test #2 had a sudden shock up in the yield curve which is not a realistic real-world scenario – rates will not spike up 200 bps within one quarter. There will always be a lead period for rates to hike up and that period will be part of the historical data that the model reads in.

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## **IX.A. Field Test Starting Conditions - Equities**

- We suggest including runs with initial equity values down 25% or so. This would produce more tail scenarios and provide better information as to the impact.
- Another valuation date should be tested for equities. Since 12/31/2021 was the height of equity markets many variable annuity blocks were close to at-the-money. Testing as of 3/31/2020 would likely reveal much more significant impacts to reserves.
- Starting conditions that increase the ITM of living benefit guarantees should be tested since the impacts would likely be larger. As of 12/31/2021 the living benefit guarantees were not very in-the-money due to favorable equity markets.
- Additional testing using a different starting date as a baseline would be ideal to better understand how different equity and rate environments could affect the sensitivity of VM-21 reserves and capital. Cash values were high as of 12/31/21 because of a strong equity and low-rate environment at that time. Many scenarios were floored at these high cash values, which may distort some of the field test results.

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## **IX.B. Attribution Analysis**

- We would like to receive more information on why each test was chosen and additional commentary on the specific element of the new ESG that each test is designed to analyze to assist in our understanding the results and guide more detailed thinking to determine if such tests are appropriate for future use in a new ESG.
- A more detailed breakout of attribution steps along with supporting commentary for isolated impact testing of key ESG elements would be preferred. The current attribution steps seem to adjust multiple things at once which makes it harder to quantify individual impacts from the new ESG mechanics.

Note:

There were many comments about attribution analysis relating to the comparability of the field test runs. This will be discussed in more detail when quantitative field test results are presented.

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## **IX.C. Other Field Test Considerations**

- Allow extra time to vet the field test scenarios and design.
- What is the success factor for the new ESG? Is the goal to raise overall reserve/capital level, and does NAIC have an idea of how much increase would be appropriate?
- More information should be gathered to understand differences across companies
  - Hedging strategies and modeling
  - The nature of any dynamic policyholder behavior (e.g. to what extent does it depend on rates or equities)
  - Product and benefit guarantee composition of blocks within VM-20 reserve categories and potentially results at a more granular product level. For example, GUL and VUL results may move in opposite directions and only looking at the total may make results look as if they aren't changing much.

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## **IX.C. Other Field Test Considerations (cont.)**

- Analysis of unfloored VA results is important since certain field test runs may result in flooring at the cash surrender value.
- To the extent that there are ways to analyze the impact of using the Direct Iteration Method vs. GPVAD method as part of this work, that would be helpful. We're not sure how possible this is given that companies will have selected their method already, but with the proposed changes to the methodology likely to result in diverging impacts between the two methods, it might be worth considering.

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## X. ESG Statistics, Documentation, and Governance

### ESG Statistics

- The Treasury summary file should include the mean reversion speed along with the mean reversion point.
- Realized volatility data should be a part of the standard scenario output. It had to be added separately in the field test.
- It would be helpful to have the ability to open the entire file in Excel or Notepad for viewing. Excel did not have enough rows so transposing the data may be a solution. Notepad crashed due to the file size.
- For reporting on gross wealth factors, a tabular format is typically most useful.
- Once ESG is set, ideally Conning will provide some sort of monthly/quarterly attribution and sensitivities on a monthly basis.

## Documentation

- Details are needed on how long-term rates are generated in the Treasury model.
- It is unclear exactly how mean reversion of interest rates works in either of the interest rate models.
- It is unclear whether/how credit spreads in the bond indices are impacted by the current economic environment and what expectation is assumed longer term. The documentation says that corporate credit spreads are correlated to equity returns, but this relationship is not observed in the field test scenario sets. For example, comparing returns of the bond indices between field tests 1a and 5a, the equity model has changed, but corporate bond index returns have not).
- Full SERT scenario documentation is needed.

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## Governance

- A control environment surrounding prescribed scenario generation should be considered/implemented. This would cover model changes (recalibrations and updating inputs), procedures for posting new files, version control and notification procedures if posted files must be replaced, etc.
- Develop a repeatable and verifiable calibration methodology (e.g., calibration to data with well defined adjustments vs. unexplained selection of parameters / picking parameters through trial and error)
- Scenario sets should be available for any economic sensitivities needed by companies to manage their business and should align with the scenarios that would be produced if such economic conditions actually evolved. We know that the 12/31/19+200bps shock included a recalibration of the equity generator in the field test, but it is not clear how such recalibrations would be conducted when the new generator is prescribed. It is very important that we understand exactly how that will work.

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## Next Steps and Timeline

- As noted in this presentation, we will follow up with participants on items identified in the survey that may materially impact results (e.g. whether any modifications were made to scenarios, etc.)
- Quantitative results have been compiled for VM-21/C3P2 and VM-20 and are under review. C3P1 compilation is in progress. Prior to presenting results:
  - Questions will be sent to companies as needed regarding any template completion issues, outlier results, etc.
  - Participants will receive information showing how their results will be aggregated.
- VM-21/C3P2 quantitative results will likely be ready for discussion at a public LATF/Life RBC Working Group meeting first. Additional meetings will follow for VM-20 and C3P1.
- Meetings of the VM-20/VM-21 ESG Drafting Group and ESG Governance Drafting Group will kick off in January, 2023.
- Given the continued ESG development work and the need for a 2<sup>nd</sup> field test, implementation of the new ESG is expected no earlier than 2025.

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