LIFE ACTUARIAL (A) TASK FORCE

Life Actuarial (A) Task Force April 8, 2021, Minutes
  Life Actuarial (A) Task Force’s March 18, 2021 Conference Call Minutes (Attachment One)
  [The American Council of Life Insurers’ (ACLI’s) Amendment Proposal 2021-02 (Attachment One-A)]
  Life Actuarial (A) Task Force’s March 11 & 4, 2021 Conference Call Minutes (Attachment Two)
    NAIC Economic Scenario Generator (ESG) Questions (Attachment Two-A)
    NAIC ESG Questions and Answers (Attachment Two-B)
    NAIC ESG Question Log (Attachment Two-C)
  Life Actuarial (A) Task Force’s Feb. 25, 2021 Conference Call Minutes (Attachment Three)
    Equity Model Discussion (Attachment Three-A)
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  Life Actuarial (A) Task Force’s Feb. 11, 2021 Conference Call Minutes (Attachment Four)
    John Robinson Comments on amendment proposal 2020-11 (Attachment Four-A)
    Adoption of Amendment Proposal 2020-11 (Attachment Four-B)
    California DOI Comments on Amendment Proposal 2019-33 (Attachment Four-C)
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    Stephen Boston Comment on Amendment Proposal 2019-33 (Attachment Four-E)
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  Life Actuarial (A) Task Force’s Feb. 4, 2021 Conference Call Minutes (Attachment Five)
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    Coordinating Revisions to *Statement of Statutory Accounting Principles (SSAP) 108—Derivatives Hedging Variable Annuity Guarantees* (Attachment Five-B)
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  Life Actuarial (A) Task Force’s Jan. 28, 2021 Conference Call Minutes (Attachment Six)
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  Life Actuarial (A) Task Force’s Jan. 21, 2021 Conference Call Minutes (Attachment Seven)
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    Conning Inc. GEMS Equity and Corporate Models Overview Presentation (Attachment Eight-A)
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  Report of the Longevity Risk (E/A) Subgroup (Attachment Nine)
  Report of the Guaranteed Issue (GI) Life Valuation (A) Subgroup (Attachment Ten)
  Report of the Experience Reporting (A) Subgroup (Attachment Eleven)
  Experience Reporting (A) Subgroup’s March 2, 2021 Conference Call Minutes (Attachment Twelve)
  Report of the Indexed Universal Life (IUL) Illustration (A) Subgroup (Attachment Thirteen)
  Report of the Variable Annuities Capital and Reserve (E/A) Subgroup (Attachment Fourteen)
  Valuation Manual (VM)-22 (A) Subgroup’s March 17, 2021 Conference Call Minutes (Attachment Fifteen)
  Valuation Manual (VM)-22 (A) Subgroup’s March 3, 2021 Conference Call Minutes (Attachment Sixteen)
  Valuation Manual (VM)-22 (A) Subgroup’s Feb. 24, 2021 Conference Call Minutes (Attachment Seventeen)
  Valuation Manual (VM)-22 (A) Subgroup’s Feb. 10, 2021 Conference Call Minutes (Attachment Eighteen)
  Valuation Manual (VM)-22 (A) Subgroup’s Feb. 3, 2021 Conference Call Minutes (Attachment Nineteen)
  Valuation Manual (VM)-22 (A) Subgroup’s Jan. 27, 2021 Conference Call Minutes (Attachment Twenty)
  Valuation Manual (VM)-22 (A) Subgroup’s Jan. 20, 2021 Conference Call Minutes (Attachment Twenty-One)
  John Robinson Comment Letter (Attachment Twenty-One-A)
The Life Actuarial (A) Task Force met April 8, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Judith L. French, Vice Chair, represented by Peter Weber (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li (AL); Ricardo Lara represented by Perry Kupferman, 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 Severyinghaus represented by Bruce Sartain and Vincent Tsang (IL); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Seong-min Eom (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); and Scott A. White represented by Craig Chupp (VA).


The Task Force met March 18, 2021; March 11, 2021; March 4, 2021; Feb. 25, 2021; Feb. 11, 2021; Feb. 4, 2021; Jan. 28, 2021; Jan. 21, 2021; and Dec. 17, 2020. During these meetings, the Task Force took the following action: 1) adopted its 2020 Fall National Meeting minutes; 2) adopted amendment proposal 2020-11, which allows exemption of policies from prior issue years when there is a change in the life principle-based reserving (PBR) exemption requirements; 3) exposed amendment proposal 2020-12, which creates consistency between clearly defined hedging strategy (CDHS) requirements in VM-20, Requirements for Principle-Based Reserves for Life Products, and VM-21, Requirements for Principle-Based Reserves for Variable Annuities, and revises hedge modeling to only require CDHS if modeling future hedging reduces the reserves under VM-20 or total asset requirement (TAR) under VM-21; and 4) exposed amendment proposal 2020-13, which revises the asset collar language for negative modeled reserves.

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the Task Force’s March 18, 2021 (Attachment One), March 11 and March 4, 2021 (Attachment Two), Feb. 25, 2021 (Attachment Three), Feb. 11, 2021 (Attachment Four), Feb. 4, 2021 (Attachment Five), Jan. 28, 2021 (Attachment Six); Jan. 21, 2021 (Attachment Seven); and Dec. 17, 2020 (Attachment Eight) minutes. The motion passed unanimously.

2. **Adopted the Report of the Longevity Risk (E/A) Subgroup**

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the report of the Longevity Risk (E/A) Subgroup (Attachment Nine). The motion passed unanimously.

3. **Adopted the Report of the Guaranteed Issue (GI) Life Valuation (A) Subgroup**

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the report of the Guaranteed Issue (GI) Life Valuation (A) Subgroup (Attachment Ten). The motion passed unanimously.

4. **Adopted the Report of the Experience Reporting (A) Subgroup**

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the report of the Experience Reporting (A) Subgroup (Attachment Eleven), including its March 2 minutes (Attachment Twelve). The motion passed unanimously.

5. **Adopted the Report of the Indexed Universal Life (IUL) Illustration (A) Subgroup**

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the report of the Indexed Universal Life (IUL) Illustration (A) Subgroup (Attachment Thirteen). The motion passed unanimously.
6. **Adopted the Report of the Variable Annuities Capital and Reserve (E/A) Subgroup**

Mr. Weber made a motion, seconded by Ms. Ahrens, to adopt the report of the Variable Annuities Capital and Reserve (E/A) Subgroup (Attachment Fourteen). The motion passed unanimously.

7. **Adopted the Report of the Valuation Manual (VM)-22 (A) Subgroup**

Mr. Sartain said that Subgroup meetings were focused on addressing comments on the American Academy of Actuaries’ (Academy) Annuity Reserves and Capital Work Group (ARCWG) preliminary framework. He said the Subgroup’s goal is to provide recommendations to the Task Force on the most important items proposed by the ARCWG. The ARCWG is expected to present a draft of requirements for non-variable annuities, which the Subgroup anticipates exposing for comment by mid-summer. He said the field test, initially planned for fall 2021, has been pushed to February 2022 through June 2022, which necessitates pushing the target effective date for the VM-22, Statutory Maximum Valuation Interest Rates for Income Annuities, revisions from January 2023 to January 2024.

Mr. Sartain said the most substantive decision the Subgroup has made is to have two reserve categories for the purpose of aggregation. He said the Subgroup has deferred passing the reserve category decision to the Task Force for its consideration until it has been decided whether to recommend the standard projection amount (SPA) as a required floor or a disclosure item, and the concept of “risks managed together” is clarified. He said the Subgroup has created drafting groups to study the SPA for non-variable annuities and issues related to pension risk transfer (PRT) business.

Mr. Sartain made a motion, seconded by Mr. Chou, to adopt the report of the VM-22 (A) Subgroup, including its March 17 (Attachment Fifteen), March 3 (Attachment Sixteen), Feb. 24 (Attachment Seventeen), Feb. 10 (Attachment Eighteen), Feb. 3 (Attachment Nineteen), Jan. 27 (Attachment Twenty) and Jan. 20 (Attachment Twenty-One) minutes. The motion passed unanimously.

8. **Exposed Amendment Proposal 2020-10**

Marianne Purushotham (Academy Mortality Improvement Life Working Group [MILWG] and Society of Actuaries [SOA] Preferred Mortality Project Oversight Group [Joint Committee]) presented a recommendation (Attachment Twenty-Two) for applying a prudent level of future mortality improvement to the VM-20 reserve methodology for inclusion in the 2022 *Valuation Manual*. She said the first phase of the recommendation is the development of mortality improvement factors that will be reviewed annually in a process similar to what is used for the valuation basic table (VBT) scales. She noted that the scale will be initially based on the best estimate of recent historical mortality improvement. The rates will linearly grade to the long-term mortality improvement rates (LTMIR) over the first 10 years, remain level for five years and linearly grade to no improvement at year 20. The LTMIR is defined as the average of projection years 10–15 from the Social Security Administration (SSA) intermediate projection known as “Alt 2.”

Ms. Purushotham said the scale will be initially based on the best estimate of recent historical mortality improvement. The rates will linearly grade to the long-term mortality improvement rates (LTMIR) over the first 10 years, remain level for five years and linearly grade to no improvement at year 20. The LTMIR is defined as the average of projection years 10–15 from the Social Security Administration (SSA) intermediate projection known as “Alt 2.”

Ms. Purushotham said the recommendation proposes applying a flat margin to reduce the basic scale. The size of the margin will be determined through reserve model testing. She said other issues for immediate consideration are the short-term and long-term impacts of COVID-19, the impact of opioid addiction, the threshold for materiality and the socioeconomic-based mortality differences between the general and insured populations. She said consideration will also be given later to cohort effects on mortality improvement.

Ms. Hemphill said amendment proposal 2020-10 provides language for inclusion of the future mortality improvement proposal into the *Valuation Manual* that will reduce reserve redundancy. She said reflecting future mortality improvement will be beneficial to the yearly renewable term (YRT) field test discussions. Mr. Carmello asked if the application of the factors resulting in mortality deterioration should be mandatory. Ms. Hemphill said the proposal is intended to cover that issue. She agreed to amend the exposure to ask for comments on whether the changing language in VM-20 Section 9.C.7. from “may” to “shall” will clarify that intent. Mr. Robinson suggested that the term “prudent estimate mortality” be changed to “prudent estimate for mortality” to match the terms defined in the *Valuation Manual*. Mr. Chupp asked how the margin will be applied when there is mortality deterioration. Ms. Purushotham said the issue has not yet been decided. Mr. Chupp suggested that mortality improvement should be applied to anticipated experience assumption instead of the prudent estimate assumption.
Ms. Ahrens made a motion, seconded by Mr. Schallhorn, to expose amendment proposal 2020-10 (Attachment Twenty-Three), including the requests to change “may” to “shall” and “prudent estimate mortality” to “prudent estimate for mortality,” for a 45-day public comment period ending May 25. The motion passed, with Mr. Chupp dissenting.

9. **Discussed the ESG Implementation Timeline and Overview of the Treasury Model**

Mr. Boerner shared the Statement on Level of Documentation, Conning Intellectual Property (Attachment Twenty-Four) to help frame the discussion on economic scenario generator (ESG) documentation. Pat Allison (NAIC) and Scott O’Neal (NAIC) presented a slide deck (Attachment Twenty-Five) displaying the common themes in the ESG comment letters submitted by the Academy (Attachment Twenty-Six), the American Council of Life Insurers (ACLI) (Attachment Twenty-Seven), Equitable (Attachment Twenty-Eight), Mark Tenney (unaffiliated) and Ted Pedersen (unaffiliated) (Attachment Twenty-Nine), Steve Craighead (unaffiliated) and Mark Tenney (Attachment Thirty), Link Richardson (American General) (Attachment Thirty-One), and Matt Kaufmann (Moody’s Analytics) (Attachment Thirty-Two). The slide deck also displayed the responses provided by NAIC staff and Daniel Finn (Conning Inc.), and where applicable listed the decisions to be considered by the Task Force.

Connie Tang (Prudential) said that while it is a good idea to think about the targets to control the level of negative rates, it would be helpful to think about what the right scenario properties and behaviors are. She also raised concerns about targeting a steady state distribution. Jason Kehrberg (Academy) expressed an interest in seeing how adjusting one parameter may affect other parameters.

Mr. O’Neal said several comments on the complexity of the corporate model were received. He said the decision on the level of complexity desired for the corporate model is the purview of the Task Force. Mr. Finn said the key components are captured in the current version of the Conning ESG to reduce complexity. He noted the need for additional documentation. Mr. Robinson asked if a simpler model is possible. Mr. Finn responded affirmatively, noting that issues such as calibration and coverage would have to be considered.

Mr. O’Neal said commenters asked about the extreme equity returns provided in the ESG exposures. Mr. Finn said over long periods, cumulative returns will converge toward a distribution that is roughly lognormal. He said expected means and standard deviations of the annual returns must be adjusted to moderate the returns. He said the Task Force should decide whether to alter the targets for the mean and standard deviation of the equity model to limit the extremities of the tail scenarios.

Mr. Finn said the current calibration process considers that the equity model has a direct link to U.S. Treasury rates to attempt to recognize that the model should be arbitrage-free and work in different environments. He said the link also recognizes that investor decisions are based on the returns of all available investments. He said the Task Force should decide whether to continue using the link to Treasury rates. Randall McCumber (Lincoln Financial Group) said the equity model should consider that both the rate component and risk premium can vary. Ms. Tang said linking equity returns to changes in interest rates is preferable to a formulaic linkage of equities to interest rates in every period. Steve Tizzoni (Equitable) said the Equitable comment is supportive of the structural linkage between interest rates and equity returns. Mr. Tenney said the Cox-Ingersoll-Ross equilibrium paper shows that there is no formulaic relationship that provides a number that can be added to a short-term rate to estimate equity returns. Mr. Chang said the equity model is designed so that the level of the risk premium is more important than the interest rate.

Mr. Finn said a proposed model for international equities was recently released. The model uses regression equations for the pricing and income of international diversified equities and a separate regression, based on the emerging markets, for the aggressive equities. He said returns for the index for Europe, Australasia and Far East (EAFE) has historically tracked lower that the Standard & Poor’s (S&P) 500 and the Russell 2000 indices, despite being riskier. He said the Task Force will have to determine whether to maintain that relationship or to use a risk framework more like the S&P 500 or the Russell 2000.

Mr. O’Neal said the ACLI and the Academy expressed concern that the current timeline is insufficient to allow effective review of the ESG. He said the NAIC plans to continue with the current timeline but will adjust dates as needed to appropriately address industry concerns.

In response to comments on the data format, Mr. Finn said that Conning is amenable to providing data in whatever format the industry may require. Mr. Kehrberg said it would be preferable to have additional data related to evaluating scenarios. Mr. Finn said that he is happy to have discussions on the data companies feel are necessary. On the issue of documentation, Mr. O’Neal noted that an appropriate amount of additional documentation is being prepared for release. He said the recently updated ESG
10. **Heard an Update on SOA Research and Education**

Dale Hall (SOA) gave a presentation (Attachment Thirty-Four) on 2020 group and individual life COVID-19 mortality experience by quarter for various demographic categories and geographic regions. He noted that in the general population, the highest actual to expected ratios occurred in the age range from 35 to 54. He noted that after seeing mortality continue to improve in 2019, the 2020 results showed a 16% negative improvement. Mr. Hall noted that the presentation included a listing of other studies completed by the SOA.

11. **Heard an Update from the Academy LPC on its Recent Activities and 2021 Priorities**

Laura Hanson (Academy Life Practice Council—LPC) gave a presentation (Attachment Thirty-Five) on the LPC’s recent activities and its 2021 priorities. She also noted that the C-1 Work Group has provided the Life Risk-Based Capital (E) Working Group updated C-1 bond factors that reflect the new corporate tax rates. She highlighted the ARCWG work on VM-22 and discussed the Academy webinars and boot camps planned for 2021. She listed a few of the Academy efforts supporting its promotion of diversity and inclusion within the actuarial profession and in the broader insurance industry.

12. **Adopted Amendment Proposal 2020-13**

Mr. Weber made a motion, seconded by Mr. Leung, to adopt amendment proposal 2020-13 (Attachment Thirty-Six). The motion passed unanimously.

13. **Exposed Amendment Proposal 2021-04**

Mr. Bayerle said amendment proposal 2021-04 clarifies the references to Internal Revenue Code Section 7702 in VM-02, Minimum Nonforfeiture Mortality and Interest.

Mr. Leung made a motion, seconded by Mr. Schallhorn, to expose amendment proposal 2021-04 (Attachment Thirty-Seven) for a 21-day public comment period ending April 28. The motion passed unanimously.

14. **Exposed Amendment Proposal 2021-03**

Ms. Tang said amendment proposal 2021-03 updates VM-21 Section 6 to reflect the increase of the required minimum distribution (RMD) age from 70½ to 72. She said the Task Force should consider revising the wording in VM-21 Section 6.C.5.n to clarify that changes in the RMD age may require recalculation of the cohort weighting. She agreed to add a sentence to the exposure cover page to call attention to the potential need for additional clarification.

Mr. Leung made a motion, seconded by Mr. Weber, to expose amendment proposal 2021-03 (Attachment Thirty-Eight) for a 21-day public comment period ending May 3. The motion passed unanimously.

15. **Re-Exposed Amendment Proposal 2020-12**

Ms. Hemphill said amendment proposal 2020-12, previously exposed for public comment through March 26, has been revised to reflect the comments received from Nationwide Financial (Attachment Thirty-Nine), the ACLI (Attachment Forty) and William Wilton (Attachment Forty-One).

Mr. Robinson made a motion, seconded by Mr. Schallhorn, to expose revised amendment proposal 2020-12 (Attachment Forty-Two) for a 21-day public comment period ending April 28. The motion passed unanimously.

16. **Discussed the Mortality Data Collection Project**

Ms. Allison said the VM-51, Experience Reporting Formats, mortality data collection will begin soon. She presented an update (Attachment Forty-Three) on the mortality data collection project.

Having no further business, the Life Actuarial (A) Task Force adjourned.
The Life Actuarial (A) Task Force met March 18, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Judith L. French, Vice Chair, represented by Peter Weber (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li and Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Dana Popish Severyinghaus represented by Vincent Tsang (IL); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); and Scott A. White represented by Craig Chupp (VA).

1. **Discussed the ACLI Proposal to Extend the Nonforfeiture Timing**

Mr. Boerner said the passage of the federal Consolidated Appropriations Act, 2021 in December 2020 changed the calculated nonforfeiture interest rate for policies with guarantees of greater than 20 years to 3.75%. The American Council of Life Insurers’ (ACLI’s) amendment proposal 2021-02 (Attachment One-A) recommends allowing the use of the 2020 nonforfeiture rates through June 2022, instead of through December 2021 as allowed by the Standard Nonforfeiture Law for Life Insurance (#808). Mr. Boerner said that authority that Model #808 gives the Valuation Manual is limited to setting the nonforfeiture rate for the calendar year. He said that Model #808 allows companies the option of using the nonforfeiture rate in effect at the end of the previous calendar year. He noted that the option cannot be extended by the Valuation Manual, as the ACLI proposes. Several state insurance regulators concurred with Mr. Boerner’s interpretation of Model #808. Dan Schelp (NAIC) said while he understands the ACLI’s concerns, his reading of Model #808 and the Valuation Manual does not support the Valuation Manual changes proposed by the ACLI.

Mr. Carmello suggested that the Valuation Manual could be revised to set a fixed rate to be used for the 2022 calendar year instead of using the methodology currently in place. Mr. Serbinowski noted that Mr. Carmello’s suggestion will also allow for use of that fixed rate for 2023. Brian Bayerle (ACLI) said the ACLI understands the issues outlined by the state insurance regulators and will consider revising the amendment proposal to conform to the existing requirements. He said market issues will arise if companies are unable to get policy filings approved before the end of 2021. Paul Graham (ACLI) asked the state insurance regulators to consider the impact on small companies that had the nonforfeiture rate set at 4% for 2021 and anticipated using that rate for 2022. He said the small companies will experience resource constraints if required to change the rate to 3.75% for 2022.

Mr. Weber said the potential market disruptions is a policy issue and should not be addressed with technical solutions. He asked if the ACLI had raised the issue with the Life Insurance and Annuities (A) Committee. Mr. Graham said he had not discussed the matter with the Committee. Mr. Boerner said he would update the Committee chair on the issue. Mr. Graham agreed to withdraw the amendment proposal but said he believes a path to a solution may still be available through the Valuation Manual. He said the ACLI will consider potential next steps, including going to the Committee.

Having no further business, the Life Actuarial (A) Task Force adjourned.
1. Identify yourself, your affiliation and a very brief description (title) of the issue.

   Brian Bayerle, ACLI – Provides a six month deferral of 2021 nonforfeiture requirements and edits previously adopted changes to VM-02 for improved clarity and to remove potential circularity.

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, 2021 edition), VM-02 Section 3.A

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.)

   For 2021, the calculated 20+ duration life nonforfeiture rate is 3.75%. The 2021 Valuation Manual sets a floor at the level of the Cash Value Accumulation Test rate within Section 7702 of the U.S. Internal Revenue Code. Given that the Internal Revenue Code, Section 7702 interest rate, and therefore the statutory nonforfeiture rate, was not known until the very end of December 2020, there is a 6-month reduction in the normal 18-month timeframe available to re-price and obtain state insurance department approval of policy forms. In light of the highly critical need for companies to redesign products, as well as state insurance departments to complete their review prior to 1/1/2022 (otherwise certain products would not be available in the marketplace), we suggest delaying the 1/1/2022 effective date for the standard nonforfeiture rate to 7/1/2022 through an amendment to VM-02 in the NAIC Valuation Manual. We have a concern that the large volume of new policy forms expected to be filed, coupled with the compressed timeframe resulting from the date of passage of Section 7702 reform, could lead to an especially challenging burden for state departments of insurance to complete review within this period of time. The proposal leaves open the possibility that, if delays do occur, certain products can remain available in the first six months of 2022. Further, the amendment would clarify the language in the previously adopted edits to VM-02 to avoid any potential circularity.
Section 3: Interest

A. The nonforfeiture interest rate for any life insurance policy issued in a particular calendar year beginning on and after the operative date of the Valuation Manual shall be equal to 125% of the calendar year statutory valuation interest rate defined for the NPR in the Valuation Manual for a life insurance policy with nonforfeiture values, whether or not such sections apply to such policy for valuation purposes, rounded to the nearer one-quarter of 1%, provided, however, that the nonforfeiture interest rate shall not be less than the Applicable Accumulation Test Minimum Rate in the Cash Value Accumulation Test under Section 7702 (Life Insurance Contract Defined) of the U.S. Internal Revenue Code.

1. Through June 30, 2022, companies may use the nonforfeiture life insurance interest rate in place during 2020 to determine the nonforfeiture interest rate for life insurance in this section.

**Guidance Note:** This edit is to link with the change in the requirements in Section 7702 of the U.S. Internal Revenue Code. Companies may use the 2020 nonforfeiture life insurance interest rates in calendar year 2021 and the first six months of calendar year 2022.

2. Any option provided that allows companies to calculate minimum nonforfeiture values using a nonforfeiture interest rate not exceeding the nonforfeiture rate in the preceding calendar year shall refer to the nonforfeiture interest rate in effect on the last day of the preceding calendar year.

**Guidance Note:** The intention of the above paragraph is to address language in Section (5c)(1)(H) of the NAIC Standard Nonforfeiture Law for Life Insurance (Model #808), such that the nonforfeiture interest rate in calendar year 2023 would only be permitted to refer to the nonforfeiture interest rate in effect at 12/31/2022.

**Guidance Note:** For flexible premium universal life insurance policies as defined in Section 3.D of the Universal Life Insurance Model Regulation (#585), this is not intended to prevent an interest rate guarantee less than the nonforfeiture interest rate.
The Life Actuarial (A) Task Force met March 4 and March 11, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Judith L. French, Vice Chair, represented by Jason Wade (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li and Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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 Severyinghaus represented by Vincent Tsang (IL); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV).

1. Discussed the ESG Questions Received through March 4

Dan Finn (Conning) discussed the economic scenario generator (ESG) questions (Attachment Two-A) received from interested parties and interested state insurance regulators through March 4. Responses were focused on treasury and equity model questions; corporate model and governance questions will be addressed later. The questions and responses will be added to the Question and Answer (Q&A) document (Attachment Two-B) on the Conning website. Mr. Finn said a free trial of the GEMS application programming interface (API) is available to companies interested in testing its functionality.

Connie Tang (Prudential) asked if documentation of the interrelationships of the treasury, equity and corporate models can be made available. Mr. Finn said Conning is currently working on that documentation.

2. Discussed the ESG Questions Received through March 11

On March 11, Scott O’Neal (NAIC) described the format of the Question Log (Attachment Two-C). Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI has identified a few challenges, including the availability of documentation. He discussed the ACLI questions included in the Q&A document. Mr. Finn said Conning has focused solely on the characteristics of the model and the calibration. He said Conning has made no effort to determine the model’s impact on reserves and capital. He said the current calibration is intended to provide a starting point that will be modified based on the feedback from state insurance regulators and companies. He said the information informing the calibration will not be limited to historical data. He said decisions about issues, such as volatility, will be made later. Mr. Bayerle said more documentation is needed before the ACLI is able to provide substantive comments. He said the totality of the model, including the interaction between its components, must be understood before making decisions on parameters. Mr. Finn said without calculating the reserve components, the types of information the ACLI is asking about is difficult to provide. Ms. Tang said there needs to be an understanding of the origination of the ESG components and their underlying dynamics. Mr. Finn said Conning is willing to provide more data, test more parameters and conduct more sensitivity tests if companies feel it will be helpful. He said Conning is also willing to test parameters over different time horizons.

Mr. Finn continued answering questions submitted by Chris Conrad (American Academy of Actuaries—Academy), Mr. Chupp, Link Richardson (American International Group—AIG), and Mark Tenney (Mathematical Finance Company).

The recordings of the virtual meeting are available on the Related Documents tab of the Task Force website.

Having no further business, the Life Actuarial (A) Task Force adjourned.
Questions Received for Discussion on the March 4 LATF Call

Craig Chupp

1. How are the jump parameters determined and/or set? Does the model reflect recent jump data or long-term averages or a combination of both? Looking at historical data, how does the model determine when a jump has occurred and the magnitude of the jump? For example, considering the movement in the S&P 500 during the first couple of quarters of 2020, was this considered a jump or multiple jumps? If so, what was the criteria used to determine if a jump occurred? Over how many days was the jump considered to occur and what was the magnitude of the jump?

2. How is the value of the mean reversion speed parameter in the Variance Equation determined?

Vincent Tsang

1. In the graph “Equity Equation – Impact of Jumps” on page 10 of the ppt slides, the projected cumulative wealth factors from AIRG and GEMS at the end of the 30th year can be approximated by the line

\[ \text{AIGR cumulative wealth factor} = 1.3082 \times (\text{GEMS cumulative wealth factor}) + 1.4558 \]

For example, if GEMS cumulative factor is 4500%, the AIRG cumulative factor is approximately 6000%. Please explain the driver(s) which cause AIRG’s cumulative wealth factor being significantly higher than GEMS’s cumulative factor. Given that the title of the slide is “Equity Equation – Impact of Jumps,” is the difference in wealth factors attributable to the assumed jumps? If not, why?

2. In the first page of the ppt slides “Equity Equation,” the differential equation is listed as follow:

\[ \frac{dS(t)}{S(t)} = [(r(t) - D(t)) + \mu_0 + \mu_1 V(t) - \lambda mV(t)]dt + \sqrt{V(t)}dW_1(t) + \gamma dN(t) \]

As the jump parameters \( \lambda \) and \( V(t) \) are positive and \( m \) is negative in page 8, the drifting factor due to the jump parameters is negative. Does it mean that the jump parameters would reduce the drifting factor for the equity return?

Connie Tang

1. [Describe] the mechanics of Conning’s calibration.

2. [Discuss] Conning’s model selection decision and recommended calibration, e.g.,
   a. How did they pick this type of equity / rate linkage over other approaches, especially given that the different types can produce very different reserve/capital sensitivities?
Questions Received for Discussion on the March 4 LATF Call

b. How did they get comfortable with the appropriateness of the changes in these sensitivities when certain LATF parameters were incorporated vs. their Standard Calibration?

3. [Describe the] out of the box capabilities in GEMS to allow different relationships (vs. just substituting different parameter values)?

4. [Are there] not out-of-the-box changes that Conning would be willing to consider / implement?

Connie Tang Section G Questions

1. What would actually change on a monthly basis?
   a. Is Conning only updating initial conditions (and any LATF-specified formulaic updates – e.g., MRP)?
   b. Are the updates purely mechanical, or are there any subjective tweaks or judgment calls?

2. What is the LATF exposure / testing / approval process for:
   a. Other regularly scheduled / routine updates beyond initial condition or formulaic updates (E.g., bringing an additional year of historical data into the calibration?)
   b. More fundamental model changes (e.g., structural changes, changes in calibration methodology / philosophy)

3. What is the process if something unexpected / unanticipated happens in the monthly updates – e.g., routine (business as usual) updates create scenarios that suddenly don’t make sense, or the calibration produces invalid parameters?
   a. What is the process for reviewing and detecting questionable or inappropriate scenario distribution properties before scenarios are posted? (There should be checks for reasonability of distribution properties and not just validation that specific targets were reproduced. The scenarios exposed in Dec. reproduced LATF’s / Conning’s intended targets, but the process should have identified the inappropriate distribution of yield curve shapes.)
   b. What is the escalation process if issues are detected? (Does Conning make judgments on their own? Are regulators and industry at risk of being surprised when unusual scenarios produce unusual reported results or changes in reported results that don’t align with prior sensitivities/dynamics?)

Scott Schneider

1. Will scenarios be consistent from month to month? In other words, will new scenario number 1 be comparable to old scenario number 1 or will the scenarios be an entirely new random set? We would like to see consistency from period to period.

2. When parameters are updated, will Conning provide scenarios as of the valuation date before and after changing each parameter? Before and after changing all parameters in aggregate? We would like to be able to assess the impact of the change of each parameter.
Questions Received for Discussion on the March 4 LATF Call

3. If 10,000 scenarios are not enough for convergence (particularly for CTE98), what do we do?

4. What time steps will be available (daily, weekly, monthly, quarterly, annual) within the scenarios? How many years of projection will be provided in each scenario? We would like the ability to get time steps of any frequency from daily to annual. We would also like 90 years’ worth of time steps.

5. Will individual states (e.g. New York) have different requirements? We would like the scenarios to be provided with and without individual state requirements.

6. We believe that Conning has stated that the interest rate generator (GEMS) is arbitrage-free, but the equity return generator appears to add a positive risk premium resulting in scenarios which are not arbitrage-free. Is our understanding correct? If so, will there also be an arbitrage-free version of the equity scenarios?

ACLI

1. Criteria / stylized facts / distribution properties
   a. What criteria or stylized facts did Conning apply and how did they assess the pros/cons when selecting / developing their ESG model?
   b. How does Conning assess the reasonability of scenario outputs (i.e., in the exposed scenarios and on an ongoing basis)?
   c. What adjustments have been made either in model development or during the generation of scenarios as a result of these considerations? (Comprehensive information on these items should also be included in Conning’s documentation.)

2. It seems like the selected model and proposed calibration approach may increase procyclicality (and/or create unintuitive relationships). How did that factor into the model decisions and recommendation?
Questions Received for Discussion on the March 4 LATF Call

Moody’s Analytics

1. The model seems to support the fitting of the initial yield curve using a shift function. The limitation to 3 points seems to be a particular calibration choice. We are aware that this choice may benefit the stability of the long-term rate distribution, but it would be useful to be clear on the limitation of the model implementation and where calibration choices are chosen to mitigate these constraints in the model.

2. The mechanism to remove the discrepancies [between the actual and modeled starting yield curve] is not clear. Does this mechanism still preserve the arbitrage free properties of the model?

3. The choice of this value 3 [used in the process to fit the initial yield curve] seems to be without any motivation. What impact do these choices have on the scenario produced by the model and their robustness over short term or long-term projection horizons. The NAIC could consider not using this feature at all, i.e. accept the limitation in the model that it will not fit accurately curve or could look to motivate the choice of decay factor based on historical rate behavior/mean reversion speed etc....

4. The parametric fit of the yield curve could lead to very different long-term forward rates driving projected yields on different valuation dates i.e. from month to month. This could mean that analysis sensitive to long term projected rates could be unstable. It could be useful for the NAIC to consider the testing of the model on different valuation dates to understand the stability of the long-term scenarios and related distributions. In particular, looking at historical dates with very different starting curves and long-term forward rates (considering levels and perhaps also different gradients)

5. The model should produce a variety of yield curve shapes, and they should change over time. Is the NAIC setting targets for the correlation between different points on the yield curve or will there be alternative criteria to constrain the behavior of rates across the term-structure? A set of clear quantitative targets for correlation between different points on the yield curve can help validate the model performance objectively in this area.

6. Interest rates can be negative. Will the NAIC consider a test of the scenarios where the curve is initialized using the German or Swiss yield curve to get an understanding of how well the model will handle negative initial starting curves?

7. Is the NAIC constraining the forward expected level of the rates as part of the calibration? If so, it would be useful to understand how the model’s distributions are impacted by rate levels that could be lower than current levels. Information from European, Swiss and Japanese yield curves and implied expectations can be a useful stress test to understand how the model might behave in the event the US yields move negative.

8. There are examples of negative rates and dynamics across several developed market. Have the NAIC consider extending the calibration data set beyond just US data to improve and broaden the historical information embedded in the calibrations.
Questions Received for Discussion on the March 4 LATF Call

9. Has the NAIC considered how to assess the impact of the frequency and magnitude of negative rates produced by the model?

10. The interest rate generator should be arbitrage free. There are a few variations of the classical CIR type model mentioned in the supplied documentation. It would be good to understand if these model adjustments (floor, decay scaling, term premium assumptions) can break or disrupt the arbitrage free properties of the model. Are the NAIC producing any test of validations to assess these properties in the model?

11. Returns should be provided for funds representative of those offered in U.S. insurance products. How should insurers approach the generation of additional fund returns if the provided return series are not representative of those offered in their particular insurance products?

12. Are the credit spread model and related bond fund returns arbitrage free?

13. The NAIC have not specified any modelling constraints on the credit spread or corporate bond return modelling. Are there any features that are needed from this model? e.g. ability to capture negative spreads, stability of return distributions over long time horizons, relationship between expected defaults and spread levels, nature of the volatility of spread and defaults, volatility of returns etc.

14. If a stochastic spread and ratings-based model is chosen, how should insurers running sensitivities or projections of reserves consider updating the initialization/features of this model?

15. How has the NAIC decided on the relevant number of [corporate bond] rating classes to be modelled?

16. The modelling mentions BB rated bonds, but the model specification only has a generic high yield asset. How will the NAIC ensure this calibration is appropriate and does not understate or overstate risk due to fact the model does not capture B or CCC rated spread/bonds?

17. Is the NAIC specifying any additional criteria on the correlation of transitions/defaults across issuers and how this impact the bonds in the portfolios that are being modelling as part of the bond fund universe?

Additional Moody’s Analytics Questions

Arbitrage Free Nature of the Models

1. The models discussed are generally considered arbitrage-free pricing models. Is this requirement something that the NAIC wants to be addressed by all risk factors: interest rate, equity returns and credit spread/returns?

2. Is this criterion met for the chosen models? If it is not met, what specific implementation/calibration/configuration decisions have been made to prevent the model from being arbitrage free?

3. If the models are not arbitrage free, what additional validations and testing is being considered to ensure the model produces appropriate behaviour, stable risk premium and reasonable outcomes within each stochastic trial?
Questions Received for Discussion on the March 4 LATF Call

Interest Rate Model
1. Is the NAIC expecting to produce alternative calibrations with changes to the starting rate levels to help insurers understand the impact of the initial curve on the projected distribution? It would be good to understand the stability of the model/distributions/risk-premia if the model was initialized at a lower (or significantly higher) level than today (e.g., for a realistic example you may consider the current level of German interest rates).

Corporate Bond and Spread Model
1. Will further technical documentation on the corporate bond model (including detailed formulas, parameters, and calibration methods) be provided?
2. Can you provide details on the “stochastic modulator μ(t)” process, its parameters and its calibration?
3. The use of the jump in the Equity model is interesting. It can be challenging to calibrate and constrain these types of jump models with historical data. How is this achieved?
NAIC Economic Scenario Generator (ESG)
Questions and Answers (Q&A)
Last Modified: 3/4/2021

This document provides a summary of questions and answers relating to the development of the new ESG to be used for statutory reporting purposes. This ESG will produce real-world interest and equity scenarios to be prescribed for use in calculations of life and annuity Statutory reserves according to the Valuation Manual (e.g. VM-20, VM-21) and capital under the NAIC RBC requirements (e.g. C3 Phase 1, C3 Phase 2). This is a living document. As additional questions are received, this document will be expanded. Please email Reggie Mazyck, rmazyck@naic.org, with additional questions or any requests for clarification relating to this document.

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Section A: Treasury Model

Q1. Does the GEMS Treasury model require the initial state variables to be non-negative? If so, what happens if the initial Yields produce a negative state variable?

A: Since the states’ volatility in the GEMS Treasury model is proportional to its level, the initial state variables must be non-negative. There are several components of the GEMS’ fitting procedure which ensure that the initial state variables will meet this condition. First, when performing the search algorithm for the best 3 Pivot Points (see slide 5 of the 12/3/20 Treasury Model Presentation), the process will reject any combination that produces one or more invalid state variables. Second, in the very unlikely case that the algorithm is unable to find a valid combination, the process will:

1. pick a combination of Pivot Points
2. convert the initial yield curve into the implied starting states using the inversion process*.
3. shift the invalid state variables to 0.0001
4. calculate the discrepancy curve of the resulting implied Yield curve

*Please see “Appendix II – Initial State Variable Calculation” of the Technical Interest Rate Documentation for more information.

Q2. Are there any boundary conditions on the projected state variables? If so, how does the GEMS model ensure that those boundaries are not violated?

A: Yes, there is a boundary condition requiring that each of the state variables must be non-negative.

There are several components of the formulation that ensure that this condition is met. First, as with the Cox-Ingersoll-Ross model that is the original basis of the GEMS Treasury Model, the projected volatility of each state variable is proportional to its square root. As a result, as a state gets closer to 0, its volatility will drop to zero, which makes it harder to breach zero. Second, a valid calibration of this model requires both the mean reversion level and the mean reversion speed to be positive. Mathematically, this means $\Theta + \Lambda_0 > 0$ and $K - \Lambda_1 > 0$ for each of the state variables. These conditions ensure that any state variable which gets close to zero will have enough mean reversion so that the simulated values are very unlikely to breach zero. Finally, in the very unlikely scenario that the model does produce a negative state value in the simulation, the procedure will floor the actual value at 0.0001 similar to what the current Academy Interest Rate Generator does for Yields.

Q3. Why aren’t the Lambda parameters used in the Auxiliary functions in the Treasury Targets and Parameters.xlsx file?

A: In terms of the Auxiliary function, the lambda parameters are risk premium adjustments. So, they get used in the mean reversion speed and mean reversion level formulas. However, they do NOT get used in any pricing
formulas. These auxiliary functions are used to price zero coupon bonds (see section 2.2 of the Technical Interest Rate Documentation file).

Treasury Targets and Parameters.xlsx is embedded in the 12/18/20 Exposure document

Q4. What is the purpose of Rows 20-22 of the Auxiliary Functions tab of the Treasury Targets and Parameters.xlsx file?

A: Rows 20-22 are how the Spot Rates are converted into Par Yields. Since the model is arbitrage free, the price of a bond should equal the price of its cash flows. Specifically, for a semi-annual coupon par bond, this means \( 1 = \text{Price of Par Bond} = \text{Sum(PV of Cash Flows)} = \frac{(\text{Coupon} \times 2)}{2} \times \text{Sum(PV of 1 every 6-months)} + \text{PV of Principal} \). The second component is what we’re calculating in Row 21. Rearranging this formula, the Coupon = \( 2 \times \frac{(1 - \text{PV of Principal})}{\text{Row 21 value}} \), which is the formula in Row 22. Since the current Mean-reversion parameter (MRP) values are based on published Treasury Yields, which are expressed as semi-annual Par Yields, this procedure is used to match up the current values.

Q5. What is the foundation of the GEMS’ Treasury model? Is this the same as the current Academy generator?

A: Spot rates form the foundation of GEMS’ Treasury Yield curve construction. Specifically, if you look in the Technical Interest Rate Documentation, there is a formula for the Spot Rate at different tenors based on the current State values on page 5 (under section 2.3 “Initial Yield Curve Fitting”). For context, the 10-Year Spot Rate is based solely on the price of a single cash flow at the end of year 10 (i.e. a 10-Year zero coupon bond). On the other hand, the Academy model starts with Par Yields. In the US, these Yields reflect the semi-annual coupon that a bond would have to pay in order to be priced at Par. These Yields are consistent with the data published on the Federal Reserve’s website. These two methods are related, which is why both models can produce both Spot and Par Yields. Specifically, going from Spot Rates to Par Yields involves solving a series of equations of the form: \( 1 = \text{Par Value of Bond} = \text{Sum(PV of Fixed Coupons)} + \text{PV of Principal} \) for increasing tenors.

Q6. Which parameters in the GEMS® Treasury model influence the magnitude and frequency of negative interest rates in the projected scenarios?

A: The interaction of several parameters in the GEMS® Treasury model determine the magnitude and frequency of negative interest rates in the projection. First, the shift parameter extends the basic form of the GEMS® Treasury model to allow for the occurrence of negative interest rates. All else equal, the occurrence and magnitude of negative interest rates will increase with more negative values of the shift parameter. Negative interest rates are also influenced by the mean reversion level and the speed of mean reversion. Lower mean reversion targets with slower speeds of mean reversion will produce scenarios with more negative interest rates for longer periods of time in the projection. Additionally, greater volatility will lead to a wider dispersion of scenarios overall, again impacting negative interest rates in the projection.

Finally, although not employed in the 12/18/20 exposure of scenarios, a floor parameter could be added to the model to disallow interest rates below a specified level. Note that the introduction of a floor would cause the GEMS® Treasury model to no longer be arbitrage-free.

Q7. Can you explain the process used to convert the Treasury targets into GEMS parameters?

A: There are several key steps in this process. First, since the Academy model and GEMS are very different, Conning identified either a specific output of the simulations or a characteristic of the model which aligned with the impact that target has on the scenarios. For example, the MRP in the Academy model aligns very closely to the mean long-term 20-Year Par Yield in GEMS. Second, for each of these targets, Conning selected one or more parameters to
adjust which best aligns with this target and is likely to have minimal unanticipated impacts on the simulation. For example, as shown in the equation in section 2.1 of the Technical Interest Rate document, both Kappa and Lambda1 impact the mean reversion speed of the state variables. However, Kappa also affects the projected shape of the Yield curves because it is used in the Affine functions (section 2.2 of that same document). Therefore, Conning chose to adjust the Lambda1 parameters to meet the desired mean reversion speed targets. Finally, Conning developed either a method or a formula to convert the targets into GEMS model parameters. The final result of this process is this table:

<table>
<thead>
<tr>
<th>Target</th>
<th>Characteristic</th>
<th>Parameter(s)</th>
<th>Solution Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overnight Rate</td>
<td>Mean Ultimate 0-Month Spot Rate</td>
<td>Long-Term Target State Variables</td>
<td>Iterative Solution(^1)</td>
</tr>
<tr>
<td>1-Year Yield</td>
<td>Mean Ultimate 1-Year Par Yield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRP</td>
<td>Mean Ultimate 20-Year Par Yield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Reversion Strength for the Slope(^2)</td>
<td>Mean Reversion Speed of the state variable with the largest Kappa(^3)</td>
<td>Lambda1 for the associated state variable</td>
<td>Since the Mean Reversion speed is 1 / (Kappa – Lambda1) (see section 3), Lambda1 = Kappa – 1 / Mean Reversion Speed.</td>
</tr>
<tr>
<td>Mean Reversion Strength for the Log of the Long-Term Rate(^2)</td>
<td>Mean Reversion Speed of the state variable with the smallest Kappa(^3)</td>
<td>Lambda1 for the associated state variable</td>
<td>Since the Mean Reversion speed is 1 / (Kappa – Lambda1) (see section 3), Lambda1 = Kappa – 1 / Mean Reversion Speed.</td>
</tr>
<tr>
<td>N/A</td>
<td>Mean Reversion Speed of the final state variable(^4)</td>
<td>Lambda0 for the associated state variable</td>
<td>Since the Mean Reversion level is (Target / Mean Reversion Speed - Theta).</td>
</tr>
<tr>
<td>Long-Term Target State Variables</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) For the Long-Term Target State Variables, the nature of the problem ensures that there will be a unique solution: we have three equations with three unknowns. However, the math is too complicated to solve analytically since the Affine formulas give us Spot Yields while the longer targets are expressed as Par Yields. Therefore, Conning will simply use a search algorithm to find the unique solution.

\(^2\) The Mean Reversion Strengths in the current Academy model are expressed on a monthly basis. To convert those into the speed targets GEMS needs (i.e., annual), Conning calculated 1 / (1 – (1 – Academy’s Mean Reversion Strength) ^ 12)).

\(^3\) Within GEMS, the Kappa value affects the shape of the B(T) function which get multiplied by the state variables to calculate the final Spot Yields (see section 2.2 of the Technical Interest Rate document). When Kappa is close to zero, this curve becomes essentially flat. In that case, a 1% movement in the corresponding state value will lead to a roughly 1% parallel shift in the Spot curve. This aligns very well with how the Long-Term Rate impacts the current Academy model’s simulations. With a higher Kappa, the B(T) curve becomes very steep. So, a 1% move in this associated state variable will move the short end of the curve about 1%, but have very little impact on the long end of the curve. This behavior aligns well with how the slope impacts the current Academy model’s simulations.

\(^4\) In the Baseline proposal, this target was set to the (Mean Reversion Speed for the first state variable) * (Mean Reversion Speed for second state variable / same quantity for the first state variable in GEMS standard calibration).

For an example of how this works, please refer to the Treasury Targets and Parameters Excel worksheet.
Section B: Equity Model

Q1. How are the international fund returns expressed: hedged or unhedged?

A: The international funds are in USD and are presented on an unhedged basis. The AAA ESG also expresses international fund returns on an unhedged basis.

Q2: On the February 25th LATF call, it was mentioned that over longer projection periods the wealth factors for equity indices will be roughly lognormal despite the jump parameters (slide 13). Can you please explain the reason for this?

A: This is a consequence of the Central Limit Theorem (CLT). Based on that Theorem, if \( X_i \) are independent samples from the identical distribution, then \( \Sigma X_i \) converges to a normal distribution regardless of the distribution of the \( X_i \). A corollary of that theorem is that if \( Y_i \) are independent samples from the identical strictly positive distribution, then \( \Pi Y_i \) converges to a lognormal distribution. To see that, we use the transformation \( Y_i = \exp(X_i) \). Then, \( \Pi Y_i = \Pi \exp(X_i) = \exp(\Sigma X_i) \) since the \( X_i \) are independent if the \( Y_i \) are independent. Finally, if \( \Sigma X_i \) converges to a normal distribution, then \( \exp(\Sigma X_i) \) converges to a lognormal one.

Now the key question: how does that apply to the wealth factor for equity indices? First, the wealth factor at the end of a simulation is \( \Pi (1 + \text{Return}_i) \) across the simulation. As long as the Return cannot be less than -100%, which is the case for the equity returns in GEMS, we can let \( Y_i = 1 + \text{Return}_i \) in the above discussion. Then, the only question is whether or not these \( Y_i \) meet the other conditions of this Theorem. In Figure 1, we can see that the standard deviation for the Large Cap index is fairly stable over the 30-year projection period. Plus, the volatility reverts to long-term levels very quickly. As a result, these equity returns are close enough to being identically distributed that they will meet one of the weak forms of the CLT. By comparison, the Money Market returns have dramatic shifts in their cross-sectional volatility (see the Revised Baseline Fan Charts for an example): the returns in year 30 are almost 5 times as volatile as the returns in year 1. Therefore, the Money Market returns will take longer to converge.
Second, we need to consider independence. Under the CLT under weak dependence extension, we really just need the returns to have very little serial correlation. From Figure 2, we can see that this is the case for the Large Cap returns coming out of the GEMS model across the entire simulation period: the year over year serial correlation is never beyond +/-5%. As a result, we can expect fairly rapid conversion of the Large Cap asset class’ wealth factor to a lognormal distribution. Money Market returns, on the other hand, have a serial correlation that approaches 1 in the later projection years. This is because the Money Market returns in later years are largely driven by the simulated short-term Treasury Yields. Since the 3-Month Treasury Yield at the end of the 28th simulation period is

![Standard Deviation by Projection Year](image)

*Figure 1: Standard Deviation across time based on the Baseline calibration released on February 24, 2021 for selected Asset Classes*
highly correlated to the one at the beginning of the 29th, we see very high serial correlation in this asset class. Once again, this means the Money Market asset class’ wealth factor may never converge to a lognormal distribution.\(^3\)

Figure 2: Serial correlation across time based on the Baseline calibration released on February 24, 2021 for selected Asset Classes

1 Since the GEMS model links equity returns to short-term Treasury Yields, the expected returns will change over the projection period as Treasury Yields revert to their long-term targets. However, differences in means have no impact on the conversion process.

2 https://en.wikipedia.org/wiki/Central_limit_theorem#CLT_under_weak_dependence

3 Despite the many differences between GEMS and the current Academy models, all of these same results would apply to the current Academy model for both Large Cap and Money Market returns.

Q3: In the Revised Baseline scenarios posted on February 24, 2021, the wealth factors for some of the equity returns are quite extreme. For example, the maximum return at the end of the 30-year projection period for the Large Cap asset is over 14,600% while the minimum is -97.6%. Is this something that could be controlled through the model parameterization?

A: These values are almost entirely driven by the expected mean and standard deviation of the annual returns for this index. For comparison purposes, the corresponding values from the current Academy model for this index are about 19,400% and -53% based on the December, 2019 model. However, the Academy model has an average cumulative return that is roughly 47% higher, or roughly 1.3% per year\(^1\). If we adjust the Academy returns by this difference, then the corresponding values would be roughly 13,200% and -68%. The majority of the remainder of the difference is due to the fact that the GEMS returns are about 1.5% more volatile (i.e. 17.5% vs 16% annual...
standard deviation). As described in Q2 above, these returns end up being fairly close to lognormal, as can be seen in Figure 3.

So, what would have to change in the model structure to alter these extremes? As mentioned above, the returns at the extreme tails are largely influenced by the targets for the expected mean and standard deviation. About the only other items that could be tweaked would be to add negative serial correlation for these projections, at least of the magnitude of those seen for the Long Govt index in Figure 2. With that adjustment, the cumulative returns would grow slower than those in the Revised Baseline model. However, the historical data on which this index is built does not indicate that such an adjustment is in line with the data (see Figure 4).
Figure 4: Serial correlation of annual returns of different rolling 30-year calendar years. For example, the 2015 figure is based on the 30 annual S&P 500 total returns from December 1985 through December 2015.

1 The average annual Large Cap return from the AIRG is 8.3%. The corresponding value for the Revised Baseline GEMS Scenarios is 7.2%.

2 With no serial correlation, the cumulative return’s volatility grows with, roughly, the square root of time. With positive serial correlation, like those for Money Markets, they grow faster than that. With negative serial correlation, they will grow slower.

Section C: Corporate Model

Q1. Why are bond funds assumed to only invest in industrials (not financials)?

A: One of the goals of the bond funds was to make them consistent with the data being included in the Robust Data set. Since that data set is only going to include one set of Corporate Yields, which will be for industrials, we are suggesting only using these bonds for the bond fund returns.

Q2. Do BBB bonds in the U.S. Investment Grade Corporate bond fund returns reflect a selected BBB bond, a universe of BBB+ / BBB / BBB- bonds, or some other blend of bonds?

A: For any of the Corporate ratings, the bonds will be issued exactly at that rating (i.e. only BBB bonds in this case). The returns will reflect a broadly diversified set of bonds of the selected rating and maturity.

Section D: ESG Ancillary Tools
Q1. What is the purpose of the Scenario Reduction Tool referenced in item #9 of the ESG Implementation Timeline?

A: Conning will deliver a full set of 10,000 economic scenarios on a monthly basis along with scenario subsets produced using the Scenario Reduction Tool that is eventually adopted. The purpose of the Scenario Reduction Tool is to select subsets from the full set of 10,000 that are representative of the full set. A proposal to follow the American Academy of Actuaries’ scenario picking methodology has been exposed for public comment through March 7th, 2021. See the link below for more details.

ESG Scenario Picker Tool

Q2. What is the GEMS® API?

A: The GEMS® API (Application Programming Interface) will offer companies an alternative way to generate data in either the Basic or Robust Data Sets. The API code can be incorporated directly into third-party software to allow for faster processing of the data and a more tailored workflow. This will allow users more flexibility in the number of scenarios and projection length in their simulation process. The GEMS® API is available for a fee from Conning.

Q3. Does the API accept a starting Yield Curve or is it fed the initial state variables?

A: Right now, the API starts with the initial state variables. An enhancement to the API to accept the starting yield curve as input is planned.

Q4. Does the GEMS API support dynamic generation of forward-starting inner loop scenarios, based on a user-specified outer loop scenario Yield curve at that future projection period?

A: Yes, the GEMS API can be configured to produce inner loop scenarios based on a user-supplied outer loop scenario Yield curve.

Section E: ESG Field Test

Q1. Our company would like to volunteer to participate in the field test. How can we sign up?

A: Companies wishing to participate in the field test should contact Reggie Mazyck by March 1st, 2021 at rmazyck@naic.org and provide the following information:

- Company name
- NAIC company code
- Names and email addresses of company contacts
- A list of the product types the company intends to include in the field test

More information is provided in this document:
ESG Field Test Request

Q2. What is the scope of the ESG field test?

For both Variable Annuity (VM-21 and C3P2) and Life (VM-20) business, it seems that the new ESG directly replaces the existing prescribed AIRG parameterization. However, for fixed annuities (C3P1) there will be additional methodology considerations as the new ESG will not necessarily act as a direct substitute for the one that is currently prescribed. For example:
• C3P1 currently uses a special 12 or 50 scenario subset designed to approximate 95%-tile interest rate risk. Would new subsets be developed, or would Conning's 200 scenario set be used directly?
• C3P1 currently prescribes only the interest rate scenarios. Would prescribing GEMS mean that equity scenarios also become prescribed? This would expand the scope of C3P1 to both interest rate and market risk.
  o Some companies currently use a deterministic equity scenario with the prescribed C3P1 interest rates scenarios.
  o If C3P1 were expanded to cover market and interest rate risk, it seems like we'd need to split the total, similarly to how C3P2 needs to be split.
  o In addition, if stochastic equity returns were applied to inforce general account assets (e.g., alternative assets like hedge funds and private equity), would there be a double count with asset risks covered by C-1?

A: The scope is expected to include VA (VM-21 and C3P2), and Life (VM-20), with the new ESG directly replacing the existing prescribed AIRG parameterization. For C3P1, the methodology needs to be considered, along with field test timing, given the developments on VM-22. For now, please assume C3P1 is in scope for field testing. This will give regulators an indication of the level of participation for companies with products subject to C3P1.

Section F: Scenario File Form and Format

Q1. Once the new ESG is in production, how will scenario files be accessed?

A: Conning will produce scenarios from the Basic Data Set as of each month-end and post them to the ESG landing page on Conning’s website by 4:00 PM Central Time on the first business day of the following month. The ESG landing page on Conning’s website can be accessed by clicking the link in the “Economic Scenarios” section of the NAIC’s PBR webpage. This will be different than the prior process employed by the American Academy of Actuaries, where an excel tool was made available for users to generate scenarios on demand.

Q2. The scenario file is very large and doesn't have the same format as the Academy scenarios. Can this be changed?

A: Yes. Please provide feedback with specifics on how you would like the output to be provided.

Q3. The 12/18/20 exposure only includes 30 projected years of economic scenario data. Is it possible to produce economic scenario files with a longer projection period?

A: Yes. Please provide feedback on the projection period desired for the scenario data. Please note that the GEMS software can generate an unlimited number of periods.

Q4. The International Diversified Equity (MSCI EAFE) and Aggressive Foreign Equity (MSCI Emerging Market) do not have Income Returns in the sample data set. Will this be split between price and income in the future?

A: The model only projected total returns for these indices. Conning is developing an alternative calibration for these two indices which will split their total returns into Price and Income.

Q5. Is the scenario file labeled “Initial Exposure thru Jan 2021 GEMS Output for Dec 2019” considered to be the “Basic Data Set”?
A: Yes. The contents of the Basic Data Set are summarized in the “Basic Data Columns” file. The comment period for the exposure has been extended to March 7, 2021. The initial set of scenarios represent a first cut at the types of changes that may be desired for the ESG. Additional modifications are expected based on comments received.

Q6. There are 10,000 scenarios included in the 12/18/20 exposure. Is there a simple way to extract a smaller set of scenarios from this file?

A: If you would like to look at a smaller sample, you can just use a portion of the file (e.g. the first 1000 scenarios). The time periods for each scenario are in order, so 1,000 scenarios would be the first 36,000 rows of data. This is different from the scenario selection process exposed on 1/21/21, but it will allow you to look at a representative subset. If you are interested in just the characteristics of the scenarios, you may also be interested in the Initial Exposure Full GEMS Fan Charts on the site. That is a PDF summary for each of the columns across the full 10,000 scenarios and 360 months.

Section G: Calibration and Parameter Updates

Q1. How often will the parameters of the model be updated?

A: This is to be determined and is included as item #8 on the ESG timeline.

Q2. What will the governance process be for monthly scenario releases, routine changes to the ESG calibration, and more structural changes to the ESG model?

A: This is to be determined and will be addressed as part of items #8 and #25 on the ESG timeline.

Q3. Will calibrated parameters of the GEMs model be published?

A: The expectation is that the parameters will be published. There will also be formulas published which link the target parameters, such as the MRPs, to the GEMS’ model parameters.

Q4. Will the data used for each calibration be publicly available?

A: Every attempt will be made to use public information. However, when that is not possible, Conning will release the Bloomberg ticker, or other appropriate indicators, for the source of the data.

Q5. Will a spreadsheet tool be made public that replicates the new algorithms used to develop the scenarios?

A: No. While some components of the model will be documented via spreadsheets, such as the Treasury Targets and Parameters.xlsx file that was included in the Exposure Draft, those interested in generating the scenarios directly should contact Conning about either the GEMS API or software.

Section H: Documentation

Q1. What is the plan for releasing additional documentation on the Treasury, Equity, and Corporate models?

A: Conning has produced initial documentation for the Treasury, Equity, and Corporate models. This documentation can be accessed by clicking the link under the “Economic Scenarios” section of the NAIC’s PBR...
Section I: 12/17/20 LATF Equity and Corporate Model Presentation

Q1. On page 13, are the 2 year and 30 year “columns” annualized returns?

A: No, those are summaries of the total return over the associated year. For example, the values in the second column reflect a summary of the 10,000 total returns from Sept 2021 through Sept 2022 from the current AIRG model.

Q2. On page 18, are the 34 negative thirty year returns for GEMS, and 3 for the AIRG, out of 10,000 scenarios? One would expect about 50 negative returns for the AIRG, if it is for 10,000 scenarios.

There have been no negative 30-year periods for the S&P 500, even if you include the Great Depression. There are some good reasons to exclude the Great Depression from consideration for S&P 500 returns. The S&P did not become 500 stocks until 1957, being only 90 stocks from 1929 until 1957. SEC rules and other governance and advances in understanding of economics provide greater information and protection for investors than existed in the 1920’s and 1930’s. Comparisons to those periods might be more appropriate for some of the smaller and less well diversified indices in the scenarios.

A: Yes, both of those counts are out of 10,000 scenarios. These were scenarios selected where the cumulative return was below 0 for all 30 years of the simulation. So, it is a subset of the ones that end the simulation below zero.

Q3. How are the correlations on page 22 being computed?

A: For those correlations, we first sorted the relevant scenarios (i.e. rolling 12-month periods for the historical data, the 10,000 scenarios for the first year for the simulations) based on the US Large Cap (i.e. S&P 500) total return. Next, we broke that data down into 5 equal quintiles. So, for the GEMS scenarios, the ones in the 1st quintile reflect the 2000 scenarios with the smallest US Large Cap total returns. Finally, the bars reflect the correlation between the US Large Cap and US Small Cap (i.e. Russell 2000) within these quintiles.

Section J: 12/18/20 LATF Exposure

Q1. Scenarios were provided as of 12/31/19. Can they be provided as of 9/30/20 or 12/31/20?

This would be useful given lower starting rates than 12/31/19, and the scenarios could use the 3.25% 20-year mean reversion target for UST.

A: Yes. However, we expect to improve the model calibration and provide a new set of scenarios based on comments received on the 12/18/20 exposure. We propose to wait until then to provide scenarios as of different dates.

Q2. In the target formulas shown in the Targeting Example.xlsx file included in the 12/18/20 exposure, it looks like Theta and Lambda0 get added together in the targets. Why are there two separate parameters?
A: For the Long-Term State value targets (i.e. Column J of the Model Parameters tab of Targeting Example.xlsx file), the formula does add together Theta and Lambda0. A similar manipulation happens with the Kappa and Lambda1 parameters: those same formulas use the difference between these two parameters. Both Lambda0 and Lambda1 are risk premium parameters. Specifically, they are the ones which allow the long-term reversion levels for Yields to differ from those implied by the initial Yield curve. Whenever the model needs to price a set of cash flows (e.g. determining a particular Spot Rate), it does NOT use these risk premiums. That is why all of the formulas on the Auxiliary Functions tab of that spreadsheet, which are used to determine spot rates at different tenors, only reference parameters from the Theta, Kappa, and Sigma columns. This is also why there are two separate parameters: one that gets used for pricing (i.e. Theta and Kappa) and one that gets used as a risk premium (i.e. Lambda0 and Lambda1).

For more information, see the Treasury Model documentation.

Q3. Do the mean reversion level and speed in the Risk-Neutral model impact the scenarios in the Real-World model?

A: No, the Real-World model only relies on the mean reversion characteristics of the Real-World model, just like the current Academy generator.

Section K: Governance

Q1. What is the LATF ESG exposure, testing, and approval process?

Please explain the process for:
- Regularly scheduled / routine updates beyond initial condition or formulaic updates (E.g., bringing an additional year of historical data into the calibration), and
- More fundamental model changes (e.g., structural changes, changes in calibration methodology / philosophy).

A: The governance process is to be determined and will be addressed as part of items #8 and #25 on the ESG timeline.
<table>
<thead>
<tr>
<th>Item #</th>
<th>Source</th>
<th>Question</th>
<th>Type</th>
<th>Addressed?</th>
<th>If so, where?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACLI</td>
<td>Criteria / stylized facts / distribution properties</td>
<td>Question</td>
<td>Pending/Partial</td>
<td>ESG Goals; Model Selection Slides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. What criteria or stylized facts did Conning apply and how did they assess the pros/cons when selecting / developing their ESG model?</td>
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<td>b. How does Conning assess the reasonableness of scenario outputs (i.e., in the exposed scenarios and on an ongoing basis)?</td>
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<td>c. What adjustments have been made either in model development or during the generation of scenarios as a result of these considerations?</td>
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<td>{Comprehensive information on these items should also be included in Conning’s documentation.}</td>
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<td>2</td>
<td>ACU</td>
<td>It seems like the selected model and proposed calibration approach may increase procyclicality (and/or create unintuitive relationships). How did that factor into the model decisions and recommendation?</td>
<td>Question</td>
<td>No</td>
<td>Expect this to be part of the Field Test</td>
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<td>3</td>
<td>ACLI</td>
<td>Documentation Request</td>
<td>Documentation</td>
<td>No</td>
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<td>Please provide greater specifics about the processes, distributions, etc. Such information needed includes:</td>
<td>Request</td>
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<td>a. Model selection considerations</td>
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<td>b. Direct and indirect relationships (e.g., equity risk premium, equity / credit / rate / spread relationships)</td>
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<td>c. Fund return mechanics - including the composition of bond indices and derivation of bond fund returns, use / modeling of exchange rates in international equity returns</td>
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<td>d. State process information - including all distributions and correlation structures</td>
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<td>e. Calibration information - including model parameters and calibration targets at multiple points in time; methodologies for setting initial values and long-term targets; how and where historical data is used and the benchmarks used; adjustment processes / use of judgment; process and judgment used when a calibration fails; identification of the values that would be updated at each reporting period, regularly, or based only on triggering events</td>
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<td>f. Process and criteria for evaluating the reasonableness each published scenario distribution (beyond validating that targets are reproduced)</td>
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<td>4</td>
<td>ACU</td>
<td>On the 2/25 call, Conning indicated that international equity returns use a different model. Please provide documentation for that model (as well as any FX model that may drive international returns).</td>
<td>Documentation</td>
<td>No</td>
<td>This will be available shortly</td>
</tr>
<tr>
<td>5</td>
<td>ACLI</td>
<td>Documentation Request</td>
<td>Statistical</td>
<td>Yes</td>
<td>Will be added to new Validation Report</td>
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<td>It would be beneficial for Conning to provide more meaningful statistics, both in the presentations and in the report packages that accompany the exposed scenarios sets and sensitivities.</td>
<td>Request</td>
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<td>a. Equity returns in the presentations and fan charts should focus on the distribution of accumulation factors over time. This information is more relevant that annual returns in a single year.</td>
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<td>b. Given the interrelationship between Conning's models, fan charts / statistics should be provided for rates, equities, bonds, and the underlying credit drivers. This information is necessary as changing interest rates will affect equity returns and perhaps other aspects of the model.</td>
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<td>6</td>
<td>ACLI</td>
<td>Please provide the SERT scenarios based on Revised Baseline UST calibration.</td>
<td>Scenario Request</td>
<td>Pending</td>
<td>Will be released shortly</td>
</tr>
<tr>
<td>7</td>
<td>ACLI</td>
<td>Please provide the scenario file and model parameters (including initial values) are also available which will make the 12/31/2010 scenarios a more useful data point in analysis.</td>
<td>Scenario Request</td>
<td>Pending</td>
<td>Will be released shortly</td>
</tr>
<tr>
<td>8</td>
<td>ACLI</td>
<td>For a +/- 25 bps change in the overnight rate, how would the accumulation factor distribution for equities change (across all periods – i.e., traditional calibration point table + additional percentiles)? Other sensitivities to individual initial conditions should also be provided (e.g., +/- initial vols since that seems to drive equity vol and jumps).</td>
<td>Question</td>
<td>No</td>
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<tr>
<td>9</td>
<td>Chris Conrad</td>
<td>With respect to the treasury calibration, is the optimization problem (i.e. solving for theta, kappa, displacement, etc.) convex. If not how does Conning ensure that the calibration used reflects a global minimum? Is this optimization problem as configured a constrained problem? Does the optimization function contain any regularization terms? Empirically does the optimization routine exhibit sensitivity to initial conditions (it would be nice to see a monte carlo optimization to show the algorithms stability)?</td>
<td>Question</td>
<td>No</td>
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<td>10</td>
<td>Chris Conrad</td>
<td>With respect to the equity model, do the parameters vary over time to correct for the induced vol from the rates model? If this isn’t corrected for, does that mean that the equity distribution for the first timestep will accurately reflect the history but at later timesteps will not?</td>
<td>Question</td>
<td>No</td>
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<tr>
<td>11</td>
<td>Connie Tang</td>
<td>{Describe} the mechanics of Conning’s calibration. Note:</td>
<td>Question</td>
<td>Pending</td>
<td>Will be released shortly</td>
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<tr>
<td>12</td>
<td>Connie Tang</td>
<td>{Discuss} Conning’s model selection decision and recommended calibration, e.g.,</td>
<td>Question</td>
<td>Partial/Pending</td>
<td>Model Selection Slides, to be released</td>
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<td>a. How did they pick this type of equity / rate linkage over other approaches, especially given that the different types can produce very different reserve/capital sensitivities?</td>
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<td>b. How did they get comfortable with the appropriateness of the changes in these sensitivities when certain LATF parameters were incorporated vs. their Standard Calibration?</td>
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<td>Question</td>
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<tr>
<td>13 Connie Tang</td>
<td>Describe the out-of-the-box capabilities in Excel to allow different ROIs to be considered. How would this work?</td>
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<td>14 Connie Tang</td>
<td>(Please advise if this is not a question or if the response is not relevant)</td>
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<tr>
<td>15 Connie Tang</td>
<td>What is the expected accuracy of the model?</td>
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<tr>
<td>16 Connie Tang</td>
<td>When would it be necessary to change or expand the model?</td>
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<tr>
<td>17 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<tr>
<td>18 Connie Tang</td>
<td>Is there any calibration or testing associated with the model?</td>
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<td>19 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<td>20 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<td>21 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<td>22 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<td>23 Connie Tang</td>
<td>How often would you expect to update the model?</td>
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<tr>
<td>24 Craig Chupp</td>
<td>Are there any boundary conditions on the state variables?</td>
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<tr>
<td>25 Q&amp;A</td>
<td>Are there any boundary conditions on the state variables?</td>
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<tr>
<td>26 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>27 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>28 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>29 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>30 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>31 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>32 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>33 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<td>34 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
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<tr>
<td>35 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 Mark Tamney</td>
<td>Are there any boundary conditions on the state variables?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>38</td>
<td>Scott Schneider</td>
<td>What time steps will be available (daily, weekly, monthly, quarterly, annual) within the scenarios? How many years of projection will be provided in each scenario? We would like the ability to get time steps of any frequency from daily to annual. We would also like 30 years' worth of time steps.</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section F, Q7</td>
</tr>
<tr>
<td>39</td>
<td>Scott Schneider</td>
<td>Will individual states (e.g. New York) have different requirements? We would like the scenarios to be provided with and without individual state requirements.</td>
<td>Question</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Scott Schneider</td>
<td>We believe that Conning has stated that the interest rate generator (GEMS) is arbitrage-free, but the equity return generator appears to add a positive risk premium resulting in scenarios which are not arbitrage-free. Is our understanding correct? If so, will there also be an arbitrage-free version of the equity scenarios?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q6</td>
</tr>
<tr>
<td>41</td>
<td>Seong-min Eom</td>
<td>I propose the scenarios listed below exposed for public comments and review. - The new revised scenario - Higher Volatility - Alternative Shift - Alternative Start Date If we can combine multiple revisions, I suggest adding Higher Volatility with Alternative Shift.</td>
<td>Scenario Request</td>
<td>Yes</td>
<td>Posted to naic.conning.com/scenario files 2/4/2021</td>
</tr>
<tr>
<td>42</td>
<td>Seong-min Eom</td>
<td>In the scenario statistics, I want to suggest adding maximum and minimum in the fan chart (already shown in the summary table) and providing volatility distributions. Also want to have correlations between credit and interest rates, between credit and equities, and between equity funds.</td>
<td>Statistic Request</td>
<td>Pending</td>
<td>New set of Fan Charts</td>
</tr>
<tr>
<td>43</td>
<td>Steve Tizoni</td>
<td>Please describe the process through which current @ valuation date) equity volatilities revert towards long term equity volatility targets, with a focus on the speed and strength of the reversion process.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Steve Tizoni</td>
<td>We appreciate the sensitivities that were recently performed and summarized on the NAIC website. Would it be possible to receive the raw scenario output for the 12/31/2020 scenario set?</td>
<td>Scenario Request</td>
<td>Yes</td>
<td>naic.conning.com/scenario files</td>
</tr>
<tr>
<td>45</td>
<td>Tim Finnegan</td>
<td>Q&amp;A Section F: Q3: # of projected periods for scenarios For most stochastic projections we prefer at least 40 years of stochastic scenarios. For certain product line testing, 65 year projections are used.</td>
<td>Comment</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Tim Finnegan</td>
<td>Related: SERT scenarios The exposed set of SERT scenarios extended for 30 years. We feel the projection period output for SERT scenarios needs to be even longer than what is reasonable for most stochastic projections because a section of VM-20 calls for projecting “cash flows for a period that extends far enough into the future so that no obligations remain.” For this purpose, a 100 year projection period should suffice.</td>
<td>Comment</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Vincent Tsang</td>
<td>In the graph “Equity Equation – Impact of Jumps” on page 10 of the ppt slides, the projected cumulative wealth factors from AIRG and GEMS at the end of the 30th year can be approximated by the line AIRG cumulative wealth factor = 1.3082(GEMS cumulative wealth factor) + 1.4558 For example, if GEMS cumulative factor is 4500%, the AIRG cumulative factor is approximately 6000%. Please explain the driver(s) which cause AIRG’s cumulative wealth factor being significantly higher than GEMS’s cumulative factor. Given that the title of the slide is “Equity Equation – Impact of Jumps,” is the difference in wealth factors attributable to the assumed jumps? If not, why?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q4</td>
</tr>
</tbody>
</table>
| 48 | Vincent Tsang | In the first page of the ppt slides “Equity Equation,” the differential equation is listed as follow: \[
de^{dt}/(S(t)) = (r(t)-D(t)) + \mu_0 + \mu_1 V(t) - \lambda N(t) + dW_0(t) + V(1) + dW_1(t) + \sigma N(t) \] As the jump parameters \( \mu_0 \) and \( \mu_1 \) are positive and \( \lambda \) negative in page 8, the drifting factor due to the jump parameters is negative. Does it mean that the jump parameters would reduce the drifting factor for the equity return? | Question | Yes | ESG Q&A, Section B, Q5 |
The Life Actuarial (A) Task Force met Feb. 25, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Judith L. French, Vice Chair, represented by Jason Wade (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li and Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV).

1. **Discussed General ESG Updates**

Pat Allison (NAIC) provided an update on the economic scenario generator (ESG) project. She said the landing page on the Conning & Company (Conning) website has been revised to facilitate access to ESG documentation. She said 23 companies have volunteered so far to participate in the ESG field test. She said participation requests will be accepted beyond the March 1 deadline. She said the question-and-answer (Q&A) document and technical documentation are available on the Conning website.

2. **Heard a Presentation on the Equity Model from Conning**

Daniel Finn (Conning) presented a slide deck (Attachment Three-A) on the GEMS equity model. He said the basic dataset provides equity indices for small cap, mid-cap, large and aggressive U.S. equities. He discussed the following items related to equity returns: 1) risk premium parameters; 2) variance parameters; 3) jump parameters; and 4) dividend parameters. He noted that the calibration methodology looks at recent equity price changes over the period leading up to the model start date.

3. **Received an Overview of the Recent Exposures**

Scott O’Neal (NAIC) provided an overview of the list of ESG documents (Attachment Three-B) that the Task Force chair exposed on Feb. 24. The exposures are available on the Exposure tab of the Task Force website for public comment through March 22. The documents are also available on the Conning website.

The recording of the virtual meeting is available on the Related Documents tab of the Task Force website.

Having no further business, the Life Actuarial (A) Task Force adjourned.
Overview of GEMS® Equity Model Formulae and Parameters
Feb. 25, 2021
Dan Finn, FCAS, ASA – Managing Director at Conning

Agenda

1. Equity Model Equations
2. Risk Premium Parameters
3. Variance Parameters
4. Jump Parameters
5. Dividend Parameters
Equity Equations

\[
\frac{dS(t)}{S(t)} = [(r(t) - D(t)) + \mu_0 + \mu_1 V(t) - \lambda mV(t)]dt + \sqrt{V(t)}dW_1(t) + \gamma dN(t)
\]

\[
dV(t) = (\alpha - \beta V(t))dt + \sigma \sqrt{V(t)}dW_2(t)
\]

\[
dD(t) = \kappa (\alpha_D + \beta z(t) - D(t))dt + \sigma_D \sqrt{D(t)}dW_3(t) + D(t)\gamma_D dN(t)
\]

Where:
- \( r(t) \) is the short rate simulated by the interest rate model
- \( D(t) \) is the stochastic dividend yield
- \( \mu_0 \) and \( \mu_1 \) are risk premia
- \( V(t) \) is the stochastic variance
- \( N(t) \) is a Poisson counting process with intensity \( \lambda \) which is shared by the price and dividend processes
- \( \gamma \) is a variable jump size
- \( m \) is the average of the variable jump size \( \gamma \)
- \( \beta \) is a parameter controlling the mean reversion speed of the variance process
- \( \sigma \) is the instantaneous variance of the variance process
- \( \kappa \) is a parameter controlling the mean reversion speed of the dividend process
- \( \alpha_D \) is a parameter controlling the mean reversion level of the dividend process
- \( \sigma_D \) is the instantaneous variance of the dividend process
- \( \gamma_D \) is the variable jump size of the dividend process

Equity Equations

Easiest to break it down into our categories:
1. Risk Premium Parameters
2. Variance Parameters
3. Jump Parameters
4. Dividend Parameters
Equity Equations

Easiest to break it down into our categories:

1. Risk Premium Parameters

<table>
<thead>
<tr>
<th>Risk Premium Parameters</th>
<th>Large Cap</th>
<th>Mid Cap</th>
<th>Small Cap</th>
<th>Aggressive US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Return ($\mu_0$)</td>
<td>0.05193343</td>
<td>0.054419634</td>
<td>0.058658186</td>
<td>0.065662379</td>
</tr>
<tr>
<td>Risk Premium Coefficient ($\mu_1$)</td>
<td>0.092564524</td>
<td>0.001976953</td>
<td>0.001216322</td>
<td>0.018593352</td>
</tr>
</tbody>
</table>

Equity Returns

![US Equity Total Return](chart.png)
Equity Equations

Easiest to break it down into our categories:

1. Risk Premium Parameters
2. Variance Parameters

<table>
<thead>
<tr>
<th>Risk Premium Parameters</th>
<th>Large Cap</th>
<th>Mid Cap</th>
<th>Small Cap</th>
<th>Aggressive US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Value</td>
<td>0.010408794</td>
<td>0.014820659</td>
<td>0.015796296</td>
<td>0.018894151</td>
</tr>
<tr>
<td>Alpha (α)</td>
<td>0.00556428</td>
<td>0.004701873</td>
<td>0.004907813</td>
<td>0.008586708</td>
</tr>
<tr>
<td>Beta (β)</td>
<td>0.396577448</td>
<td>0.261910925</td>
<td>0.278360478</td>
<td>0.307103203</td>
</tr>
<tr>
<td>Sigma (σ)</td>
<td>0.081871925</td>
<td>0.077045982</td>
<td>0.096470077</td>
<td>0.090934214</td>
</tr>
</tbody>
</table>

Equity Returns

[US Equity Total Return Chart]

Year 30 of Simulation
Equity Returns – Impact of Treasury Calibration

Equity Equations

Easiest to break it down into our categories:

1. Risk Premium Parameters
2. Variance Parameters
3. Jump Parameters

<table>
<thead>
<tr>
<th>Risk Premium Parameters</th>
<th>Large Cap</th>
<th>Mid Cap</th>
<th>Small Cap</th>
<th>Aggressive US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Jump Intensity (1.1)</td>
<td>139.5881991</td>
<td>113.4167777</td>
<td>112.9783715</td>
<td>128.7243452</td>
</tr>
<tr>
<td>Jump Size Mean (m)</td>
<td>-0.052498034</td>
<td>-0.042004029</td>
<td>-0.069631949</td>
<td>-0.050422735</td>
</tr>
<tr>
<td>Jump Size Volatility</td>
<td>0.0575</td>
<td>0.05749</td>
<td>0.057488</td>
<td>0.05949</td>
</tr>
</tbody>
</table>
Equity Equation - Impact of Jumps

**S&P 500 Total Return**

SQ. 2020

- AAA Generator
- GEMS Scenarios

Equity Equation - Impact of Jumps

**Cumulative 30-Year Wealth Factor**

GEMS vs AIRG

\[ y = 1.3082x + 1.4558 \]
Equity Equation - Impact of Jumps

Equity Equations

Easiest to break it down into our categories:

1. Risk Premium Parameters
2. Variance Parameters
3. Jump Parameters
4. Dividend Parameters

<table>
<thead>
<tr>
<th>Risk Premium Parameters</th>
<th>Large Cap</th>
<th>Mid Cap</th>
<th>Small Cap</th>
<th>Aggressive US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha ($\alpha$)</td>
<td>0.013265383</td>
<td>0.008360257</td>
<td>0.01212561</td>
<td>0.006587937</td>
</tr>
<tr>
<td>Kappa ($\kappa$)</td>
<td>0.461711897</td>
<td>0.330378827</td>
<td>1.149459043</td>
<td>0.550540254</td>
</tr>
<tr>
<td>Theta ($\theta$)</td>
<td>0.005172487</td>
<td>0.045636438</td>
<td>0.001348106</td>
<td>0.066856412</td>
</tr>
<tr>
<td>Sigma ($\sigma$)</td>
<td>0.030871345</td>
<td>0.020316506</td>
<td>0.047428824</td>
<td>0.019789501</td>
</tr>
</tbody>
</table>
ESG Comment Period Extensions

Please note that the comment period for all previous ESG exposures has been extended to **March 22nd, 2021**. Comments received on all the ESG exposures will be discussed at the Spring NAIC National Meeting LATF session on April 8th, 2021.

ESG Exposure 2/24/21: Alternative Treasury Calibrations

The items listed below are exposed for a public comment period ending on **March 22nd, 2021**.

**LATF ESG Exposure 2.24.21 for Revised Baseline Calibration** – exposed for comments through 3.22.2021

Regulators and the NAIC have received feedback on the 12/18/20 exposure of an initial set of proposed ESG parameters and associated economic scenarios. One key comment on the treasury scenarios was that the prevalence of inverted Yield curves in the scenarios was much higher than would be expected considering relevant history. The parameterization of the treasury model was adjusted to correct for this issue, and a new set of scenarios was produced using this calibration. The specifics of the revised parameterization are explained in the “Outline of Revised Baseline Calibration” file, a “Treasury Parameters – Revised Baseline” excel document, and a series of fan charts. This set of scenarios will be referred to as the “Revised Baseline” and are included on the ESG landing page.

Exposed Items:
- Outline of Revised Baseline Calibration
- GEMS Output for Dec 2019 - Revised Baseline Calibration
- Treasury Parameters – Revised Baseline
- Fan Charts - Revised Parameters
- Average Yield Summary from Basic Data Set – Revised Baseline

**LATF ESG Exposure 2.24.21 for Alternative Calibrations** – exposed for comments through 3.22.2021

(Note: Fan charts shown for this exposure display the Revised Baseline Scenarios as of 2019 Q4 as shaded blue percentiles compared to the Alternative Scenarios described in each file name)

To help regulators and interested parties understand the impact to the scenarios of changing parameters, key targets in the treasury model were altered from their values in the “Revised Baseline” and statistics and graphs were developed from the resulting scenarios. Individual targets for the mean reversion level, mean reversion speed, volatility, and shift parameters were tested. Additionally, a set of scenarios that altered the volatility and shift parameters together was also produced. Finally, the initial conditions in the “Revised Baseline” were updated from 12/31/2019 to 12/31/2020 to illustrate the impact on the scenarios. Details on the altered calibrations described above are described in “Outline of Alternative Calibrations”, Treasury Parameters excel spreadsheets, and fan charts.

Exposed Items:
- Outline of Alternative Calibrations
- Treasury Parameters - Higher MRP
- Fan Charts - Higher MRP
Purpose of the Alternative Treasury Calibrations

The materials described above are being exposed in order to:

- Educate regulators and interested parties on how changing various targets impacts the parameters and corresponding scenarios produced by the ESG, and to
- Generate comments on the desired calibration or calibrations to be utilized in industry field testing.

Supplemental Materials to Prior ESG Exposures

The items listed below are supplemental to previously exposed materials.

**LATF ESG Exposure 1.21.21 for ESG Scenario Statistics and Reports – exposed for comments through 3.22.2021**

The 1/21/21 ESG Scenario Statistics and Reports exposure detailed reports and statistics that are planned to be delivered with the production scenario files. The files below have been added to give examples of the simulation summary report, the subset reports, and the average Yield summary reports. These reports are based off of the calibration exposed 12/18/2020.

Supplemental Materials:

- 1000 Path Subset Summary from Basic Data Set exposed 12.18.20
- 500 Path Subset Summary from Basic Data Set exposed 12.18.20
- 200 Path Subset Summary from Basic Data Set exposed 12.18.20
- 50 Path Subset Summary from Basic Data Set exposed 12.18.20
- Average Yield Summary from Basic Data Set exposed 12.18.20
- Simulation Summary from Basic Data Set exposed 12.18.20
LATF ESG Exposure 1.21.21 for Scenario Picker Tool – exposed for comments through 3.22.2021

The 1/21/21 ESG Scenario Picker Tool exposure detailed a methodology to produce representative subsets from the full set of 10,000 scenarios. The files listed below are the scenario subset files and are based off of the calibration exposed 12/18/2020. Additionally, the “Significance Values – Data” file illustrates how the chosen methodology was used to produce scenario subsets.

Supplemental Materials:
1000 Path Subset from Basic Data Set exposed 12.18.20.
500 Path Subset from Basic Data Set exposed 12.18.20
200 Path Subset from Basic Data Set exposed 12.18.20
50 Path Subset from Basic Data Set exposed 12.18.20
Significance Values – Data

LATF ESG Exposure 1.21.21 for SERT Scenarios – exposed for comments through 3.22.2021

The 1/21/21 Stochastic Exclusion Ratio Test (SERT) exposure described the proposed methodology to produce the VM-20 SERT scenarios using the new ESG. The SERT scenarios produced using the proposed methodology have been added to the website.

Supplemental Materials:
SERT Scenarios from Basic Data Set exposed 12.18.20

Directions on how to access the ESG landing page on Conning’s website

The ESG landing page on Conning’s website, containing all the documents described above, is accessed by navigating to the “Economic Scenarios“ section of the NAIC’s PBR website. See below for more details.

Principle-Based Reserving (PBR) Section on the NAIC’s Website

Link: https://content.naic.org/pbr_data.htm

Navigation path: NAIC Home Page → Industry → click in the box for Principle-Based Reserving (PBR) → scroll down to the Economic Scenarios section

ECONOMIC SCENARIOS

Clicking on the link labeled “Economic Scenarios, Tools, Training Materials, and Documentation” will take you to the ESG landing page on Conning’s website. Related files, including files for the ESG Exposures, can be found on the landing page.
The Life Actuarial (A) Task Force met Feb. 11, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Judith L. French, Vice Chair, represented by Jason Wade (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li and Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV). Also attending was: Steve Boston (PA).

1. **Adopted Amendment Proposal 2020-11**

Mr. Robinson discussed his comments (Attachment Four-A) on amendment proposal 2020-11, which recommends revisions to the life principle-based reserving (PBR) exemption to modify the treatment of policies resulting from conversions. Ms. Hemphill said three editorial changes to the amendment proposal were made to reflect some of Mr. Robinson’s comments. The first change revises the language in the third paragraph of Subsection 1.D.1 from “company fails to meet either condition …” to “company does not meet either condition …”. The second and third changes revise Subsection 1.D.2 by respectively placing the words “that would otherwise be” in front of “subject to VM-20” and by deleting the phrase “that are being valued.”

Mr. Leung made a motion, seconded by Ms. Ahrens, to adopt amendment proposal 2020-11 (Attachment Four-B), including the editorial changes proposed by Ms. Hemphill. The motion passed unanimously.

2. **Discussed Amendment Proposal 2019-33**

Mr. Bock said the California Department of Insurance (DOI) comments (Attachment Four-C) on amendment proposal 2019-33 (Attachment Four-D) are largely editorial but specifically mention that the Subsection 1.B and Subsection 1.C references to Subsection 1.F should be revised to clarify whether they refer to Subsection 1.F.1 or Subsection 1.F.2. He said the proposal should also clarify whether retroactivity is permitted and for what years the premium for group business subject to individual underwriting will be included in the premium considered in the determination of eligibility for the PBR exemption. Mary Bahna-Nolan (American Academy of Actuaries—Academy) agreed to make the clarifications to the proposal based on the comments. Ms. Hemphill said the intent is to include all premiums for group business subject to individual underwriting regardless of the issue year. Ms. Allison said amendment proposal 2020-11 may also need clarification on that point.

Mr. Boston said his comment letter (Attachment Four-E) suggests the need for clarification of the transition language in Subsection 1.F.1. Ms. Bahna-Nolan said the intent was to have the language apply only to group life certificates, not to group master contracts. She said the Academy will review the language.

Mr. Robinson said the primary purpose of his comments (Attachment Four-F) is to redraft some of the language. He said his primary suggestion is to bring the footnote into the body of the text. Ms. Bahna-Nolan said the Academy agrees with the comments and will revise its proposal accordingly. Reggie Mazyck (NAIC) said that making a change to the annual statement blank to move the premium for group business subject to individual underwriting from the group column to the individual life column would alleviate the need for referencing group premiums in the footnote.

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

Rachel Hemphill, TDI – Allows exemption of policies from prior issue years when there is a change in the Life PBR Exemption requirements.

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:


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.)

Valuation Manual Section II, Subsection 1.D

D. Life PBR Exemption
1. A company meeting the at least one of the conditions in D.2 below may file a statement of exemption for ordinary life insurance policies, except for policies in D.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-20. If a company has no business issued directly or assumed during the current calendar year that would otherwise be subject to VM-20, 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 D.2 was met based on premiums from the prior calendar year annual statement 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-20 for the ordinary life policies 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 not to be rejected, unless: 1) the company fails to meet either condition in D.2 below, 2) the policies contain those in 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 policies. 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 Life PBR Exemption supplemental interrogatory and provide as an explanation that the company is utilizing an ongoing statement of exemption.

2. Conditions for Exemption:
   a. The company has less than $300 million of ordinary life premiums\(^1\), and if the company is a member of an NAIC group of life insurers, the group has combined ordinary life premiums\(^1\) of less than $600 million; or
   b. The only new policies subject to VM-20 being issued or assumed by the company are due to election of policy benefits or features from existing policies that were not being valued under VM-A and VM-C and the company was exempted from, or otherwise not subject to, the requirements of VM-20 in the prior year.

3. Policies Excluded from the Life PBR Exemption:
   a. Universal life with secondary guarantee (ULSG) policies with a secondary guarantee that does not meet the VM-01, Definitions for Terms in Requirements, definition of a “non-material secondary guarantee.”

4. Each exemption, or lack of an exemption, outlined in D.1–D.3 above applies only to policies issued as assumed in the current year, and it applies to all future valuation dates for those policies. However, if policies did not qualify for the Life PBR Exemption during the year of issue but would have qualified for the Life 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 policies to qualify for the exemption. The minimum reserve requirements for the ordinary life policies subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality as defined in VM-20 Section 3.C.1 and VM-M Section 1.H.

**Valuation Manual Section II, Subsection 1.D - Footnote**

\(^1\) Premiums are measured as total (first year, single, and renewal) direct plus total (first year, single, and renewal) reinsurance assumed from an unaffiliated company from the ordinary life line of business reported in the prior calendar year life/health annual financial statement, Exhibit 1, Part 1, Column 1, “Ordinary Life Insurance” excluding premiums for guaranteed issue policies and preneed life contracts and excluding amounts that represent the transfer of reserves in force as of the effective date of a reinsurance assumed transaction and are reported in Exhibit 1 Part 1, Column 3 as ordinary life insurance premium. Preneed is as defined in VM-01.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

Addresses the exemption of policies issued in 2020 and 2021 (such as conversions) that may be exempted under the 2022 Valuation Manual requirements but did not qualify under the 2020 or 2021 Valuation Manual requirements.
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.

   Rachel Hemphill, TDI – Allows exemption of policies from prior issue years when there is a change in the Life PBR Exemption requirements.

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:


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.)

Valuation Manual Section II, Subsection 1.D

D. Life PBR Exemption

1. A company meeting the at least one of the conditions in D.2 below may file a statement of exemption for ordinary life insurance policies, except for policies in D.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-20. If a company has no business issued directly or assumed during the current calendar year that would otherwise be subject to VM-20, 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 D.2 was met based on premiums from the prior calendar year annual statement 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-20 for the ordinary life policies 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 D.2 below, 2) the policies contain those in 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 policies. 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 Life PBR Exemption supplemental interrogatory and provide as an explanation that the company is utilizing an ongoing statement of exemption.

2. Conditions for Exemption:
   a. The company has less than $300 million of ordinary life premiums\(^1\), and if the company is a member of an NAIC group of life insurers, the group has combined ordinary life premiums\(^1\) of less than $600 million; or
   b. The only new policies that would otherwise be subject to VM-20 being issued or assumed by the company are due to election of policy benefits or features from existing policies valued under VM-A and VM-C and the company was exempted from, or otherwise not subject to, the requirements of VM-20 in the prior year.

3. Policies Excluded from the Life PBR Exemption:
   a. Universal life with secondary guarantee (ULSG) policies with a secondary guarantee that does not meet the VM-01, Definitions for Terms in Requirements, definition of a “non-material secondary guarantee.”

4. Each exemption, or lack of an exemption, outlined in D.1 – D.3 above applies only to policies issued or assumed in the current year, and it applies to all future valuation dates for those policies. However, if policies did not qualify for the Life PBR Exemption during the year of issue but would have qualified for the Life 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 policies. The minimum reserve requirements for the ordinary life policies subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality as defined in VM-20 Section 3.C.1 and VM-M Section 1.H.

Valuation Manual Section II, Subsection 1.D - Footnote

\(^1\)Premiums are measured as total (first year, single, and renewal) direct plus total (first year, single, and renewal) reinsurance assumed from an unaffiliated company from the ordinary life line of business reported in the prior calendar year life/health annual financial statement, Exhibit 1, Part 1, Column 3, “Ordinary Life Insurance” excluding premiums for guaranteed issue policies and preneed life contracts and excluding amounts that represent the transfer of reserves in force as of the effective date of a reinsurance assumed transaction and are reported in Exhibit 1 Part 1, Column 3 as ordinary life insurance premium. Preneed is as defined in VM-01.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

Addresses the exemption of policies issued in 2020 and 2021 (such as conversions) that may be exempted under the 2022 Valuation Manual requirements but did not qualify under the 2020 or 2021 Valuation Manual requirements.
TO: Mr. Mike Boerner  
Chair, Life Actuarial Task Force  

SUBJECT: APF 2019-33  

DATE: August 18, 2020   December 7, 2020  

California has a number of comments, largely editorial in nature, on APF 2019-33. These are as follows:

1. In multiple places, newly proposed language states “… subject to an individual risk selection process and meeting all the conditions in VM-20 Section 1.B”. We think it is redundant to state the first condition (“subject to an individual risk selection process”) since it is listed as a requirement in VM-20 Section 1.B, so we suggest deleting that first part.

2. In item 1.B of Section II, line 3, there is a section reference error. The words “paragraph D” should be changed to “subsection 1.G”. (The use of “subsection” in place of “paragraph” will bring about consistency with other verbiage on this same page.)

3. In subsection 1.B of Section II, we suggest changing “subsection 1.F” to “subsection 1.F.2” for maximum clarity. Similarly, in subsection 1.C of Section II, we suggest changing “subsection 1.F” to “subsection 1.F.1”.

4. In Section II, we suggest switching the ordering of Subsection 1.C and 1.D to improve the flow of the requirements.

5. We think it could be helpful if language were added somewhere to specifically state that there is to be no retroactivity to policies issued before the date of the company's adoption of this new treatment of individually underwritten group. As worded, the APF is not wrong but there could be some potential for confusion.


7. The last paragraph of Subsection 1.F is a bit confusing, now that two transition periods are being discussed. The phrase “may elect to use the 2017 CSO Tables” is meant to refer only to the 2017-2019 transition period, but it does not quite come across that way. And the phrase “during the three years” may leave the reader wondering which three year period is being discussed.

8. We suggest changing the first 3+ lines of Subsection 1.G.1 to “A company meeting the condition in subsection 1.G.2 below may file a statement of exemption for individual life insurance policies and certificates, except for policies described in subsection 1.G.3. below, …”

9. Also in subsection 1.G.1 there are some missing words, so we suggest replacing the phrase “that condition subsection G.2 was met” by “that the condition of subsection 1.G.2 was met”.

10. We suggest spelling out the word “September” in the last sentence of subsection 1.G.1.

11. The footnote 1 symbol in the first line of 1.G.2 needs to be turned into a superscript.

12. In the footnote, the parenthetical starts out with “For a statement of exemptions” and we suggest it be “For statements of exemption”.
13. In VM-20 Section 1.B, we suggest replacing the current lead-in sentence with this: “Individual life certificates under a group life contract shall be subject to the requirements of VM-20 if all of the following are met:” to better conform to the language style of the VM.

14. In VM-20 Section 1.B, it would be more usual to use numbers 1 through 5 rather than Romanettes.

15. In VM-20 1.B.iv (or 1.B.4) we think “similar ... to” would sound better than “similar ... as”.

16. In VM-20 Section 1.B.v (or 1.B.5), we suggest deleting “with an NPR floor” after “principle-based valuation”, since it seems unnecessary.

17. The Guidance Note in VM-20 Section 2.A need not be italicized or bold.

18. The complete cross-out of VM-51 verbiage is a bit confusing. Since we presume there is no intent to delete VM—51, the pages of the APF concerning VM-51 should simply be removed, in our view.

19. Both this APF and the currently pending APF from Rachel Hemphill (# 2020-11) about the Company-wide Exemption propose wording changes in the same area of the Valuation Manual, so at some point someone will need to weave those two sets of wording changes together in a logical way.

Sincerely,

Ben Bock & Elaine Lam
Office of Principle-Based Reserving (OPBR)
Financial Surveillance Branch
California Department of Insurance

CC: Reggie Mazycz
    Mary Bahna-Nolan
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.
   
   American Academy of Actuaries, Life Reserves Work Group

   Addition of language to clarify the definition of individually underwritten life insurance and the applicability of Principle-Based Reserve (PBR) requirements for group insurance contracts with individual risk selection issued under insurance certificates.

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:

   January 1, 2020 version of the Valuation Manual used.

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 Appendix

4. State the reason for the proposed amendment? (You may do this through an attachment.)

   Individual insurance certificates issued under a group contract which utilize an individual risk selection process, pricing, premium rate structures and product features are similar to individual life insurance policies. They are currently excluded from VM-20 because they are filed under a group contract, but they should be subject to VM-20 due to this similarity. See Appendix.

* 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.

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Notes: APF 2019-33

W:/National Meetings/2019.../TF/LHA/

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Appendix

Issue

Certain contracts issued under a master group contract require individual risk selection in order to qualify for issuance of the group insurance certificate and do not require continued membership in the group in order to maintain coverage. The certificates have similar acquisition approaches, provisions, certificate-holder rights, pricing and risk classification, and are managed in a similar manner as individual ordinary life insurance contracts. These individual certificates should follow the same reserve requirements as other individual life contracts of the same product type. Therefore, a change is needed within the Valuation Manual to bring these individual certificates into scope of VM-20.

Six changes are recommended:

1) Within the Reserve Requirements section (Section II), change the minimum reserve requirements to also apply to group life contracts which, other than the difference between issuing a policy and issuing a group certificate, have the same or mostly similar contract provisions, risk selection process and underwriting as individual ordinary life contracts;

2) Within the Reserve Requirements section (Section II), add a transition period for individual group certificates issued on or before 1/1/2024;

3) Within the Reserve Requirements section (Section II), add language to Subsection 1.D and the corresponding footnote to include premiums from group life contracts which have individual certificates that were issued using individual risk selection processes;

4) Add new paragraph, VM-20 Section 1.B (and reformat to make current paragraph Section 1.A) to clarify group life certificates issued using individual risk selection processes, including a definition and requirements to be met, are subject to the requirements of VM-20;

5) Add guidance note after first sentence in VM-20 Section 2.A.1 that group life certificates that meet the definition for individual risk selection process use the same VM-20 Reserving Categories as defined in Section 2;

6) Draft referral to the NAIC Blanks (E) Working Group, to revise the VM-20 Reserves Supplement, Part 2 to report premiums for total Group Life and Group Life with certificates subjected to an individual risk selection process and which meet all of the conditions as defined in VM-20 Section 1.B separately.
VM Changes 1, 2 and 3 – II. Reserve Requirements

II. Reserve Requirements

This section provides the minimum reserve requirements by type of product, as set forth in the seven subsections below, as follows:

1. Life Insurance Products
2. Annuity Products
3. Deposit-Type Contracts
4. Health Insurance Products
5. Credit Life and Disability Products
6. Riders and Supplemental Benefits
7. Claim Reserves

All reserve requirements provided by this section relate to business issued on or after the operative date of the Valuation Manual. All reserves must be developed in a manner consistent with the requirements and concepts stated in the Overview of Reserve Concepts in Section I of the Valuation Manual.

Guidance Note: The terms “policies” and “contracts” are used interchangeably.

Subsection 1: Life Insurance Products

A. This subsection establishes reserve requirements for all contracts issued on and after the operative date of the Valuation Manual that are classified as life contracts as defined in SSAP No. 50 in the AP&P Manual, with the exception of annuity contracts and credit life contracts. Minimum reserve requirements for annuity contracts and credit life contracts are provided below in subsection 2 and subsection 5, respectively.

B. Minimum reserve requirements for variable and nonvariable individual life contracts—excluding guaranteed issue life contracts, preneed life contracts, industrial life contracts, and policies of companies exempt pursuant to the life PBR exemption in paragraph D below—are provided by VM-20, Requirements for Principle-Based Reserves for Life Products, except for election of the transition period in subsection 1.F below. For this purpose, joint life policies are considered individual life.

C. Minimum reserve requirements for group life contracts with individual certificates which meet all the requirements in VM-20 Section 1.B are provided by VM-20, except for election of the transition period in subsection 1.F below.

D. Minimum reserve requirements of VM-20 are considered principle-based valuation requirements for purposes of the Valuation Manual.

E. Minimum reserve requirements for life contracts not subject to VM-20 are those pursuant to applicable requirements in VM-A and VM-C. For guaranteed issue life contracts issued after Dec. 31, 2018, mortality tables are defined in VM Appendix M – Mortality Tables (VM-M), and the same table shall be used for reserve requirements as is used for minimum nonforfeiture requirements as defined in VM-02, Minimum Nonforfeiture Mortality and Interest.

F. A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for:
1. Business described in subsection 1.C above and issued on or after the operative date of the Valuation Manual and prior to 1/1/2024.

2. Business not described subsection 1.C otherwise subject to VM-20 requirements and issued during the first three years following the operative date of the Valuation Manual.

A company electing to establish reserves using the requirements of VM-A and VM-C may elect to use the 2017 Commissioners’ Standard Ordinary (CSO) Tables as the mortality standard following the conditions outlined in VM-20 Section 3. If a company during the three years elects to apply VM-20 to a block of such business, then a company must continue to apply the requirements of VM-20 for future issues of this business.

G. Life PBR Exemption

1. A company meeting the condition in subsection G.2 below may file a statement of exemption for ordinary life insurance policies including group life insurance certificates subject to an individual risk selection process and meeting all the conditions in VM-20 Section 1.B, except for policies in subsection G.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-20. Such a statement must be filed with the domiciliary commissioner prior to July 1 of that year certifying that condition subsection G.2 was met based on premiums from the prior calendar year annual statement. 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-20 for the ordinary life policies covered by the statement.

2. Condition for Exemption:
   a. The company has less than $300 million of ordinary life premiums, and if the company is a member of an NAIC group of life insurers, the group has combined ordinary life premiums of less than $600 million.

3. Policies Excluded from the Life PBR Exemption:
   a. Universal life with secondary guarantee (ULSG) policies with a secondary guarantee that does not meet the VM-01, Definitions for Terms in Requirements, definition of a “non-material secondary guarantee.”

4. Each exemption, or lack of an exemption, applies only to policies issued or assumed in the current year, and it applies to all future valuation dates for those policies. The minimum reserve requirements for the ordinary life policies subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality as defined in VM-20 Section 3.C.1 and VM-M Section 1.H.

Footnote change

Premiums are measured as direct plus reinsurance assumed from an unaffiliated company from the ordinary life line of business reported in the prior calendar year life/health annual financial statement, Exhibit 1, Part 1, Column 3, “Ordinary Life Insurance”. Premiums should also include the premiums from group life insurance certificates that were subject to an individual risk selection process and meet all the conditions as defined in VM-20 Section 1.B, except for policies in subsection G.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-20. The premiums for these group life certificates were reported in the prior calendar year life/health annual financial statement, VM-20 Reserves Supplement, Part 2, if applicable. Premiums should exclude premiums for guaranteed issue policies and preneed life contracts and exclude amounts that represent the transfer of reserves in force as of the effective date of a reinsurance assumed transaction and are reported in Exhibit 1 Part 1, Column 3 as ordinary life insurance premium. Preneed and guaranteed issue life insurance policies are as defined in VM-01.
VM Change 4 – VM-20: Requirements for Principle-Based Reserves for Life Products

VM-20: Requirements for Principles-Based Reserves for Life Products

Section 1: Purpose

A. These requirements establish the minimum reserve valuation standard for individual life insurance policies issued on or after the operative date of the *Valuation Manual* and subject to a principle-based valuation with an NPR floor under Model #820. These requirements constitute the Commissioners Reserve Valuation Method (CRVM) for policies of individual life insurance.

B. If all of the following requirements are met, individual life certificates under a group contract are included in the requirements of VM-20.

(i) An individual risk selection process, defined below, is used to obtain group life insurance coverage;

(ii) The individual certificates utilize premiums or cost of insurance schedules and charges based on the individual applicant’s issue age, duration from underwriting, coverage amount and risk classification and there is a stated or implied schedule of maximum gross premiums or net cash surrender value required in order to continue coverage in force for a period in excess of one year;

(iii) The group master contract is designed, priced, solicited, and managed similar to individual ordinary life insurance policies rather than specific to the group as a whole;

(iv) The individual certificates have similar acquisition approaches, provisions, certificate-holder rights, pricing, and risk classification as individual ordinary life insurance contracts. The group master contract and individual certificates are issued on or after the operative date of the *Valuation Manual* and subject to a principle-based valuation with an NPR floor under Model #820.

An individual risk selection process is based on characteristics of the insured(s) beyond sex, gender, age, tobacco usage, and membership in a particular group. This may include, but is not limited to, completion of an application (beyond acknowledgement of membership to the group, sex, gender and age), questionnaire(s), on-line health history or tele-interview to obtain non-medical and medical or health history information, prescription history information, avocations, usage of tobacco, family history, or submission of fluids such as blood, Home Office Specimens (HOS), or oral fluid. The resulting risk classification is determined based on the characteristics of the individual insured(s) rather than the group, if any, of which it is a member (e.g., employer, affinity, etc.). The individual certificate holder is charged a premium rate based solely on the individual risk selection process and not on membership in a specific group.
**Guidance Note:** The use of evidence of insurability does not by itself constitute an individual risk selection process. Use of information obtained from a census or question(s) regarding gender, occupation, age, income and/or tobacco usage solely for purposes of determining a rate classification does not by itself qualify a group as having used an individual risk selection process. Group insurance where the underwriting based on the characteristics of the group and census data but where some individuals are subjected to individual risk selection as a result of compensation level, age, an existing medical condition or impairment, late entry into the group, failure of the group to meet minimum participation requirements or voluntary buy-up of increased coverage does not meet the definition of an individual risk selection process,
Section 2: Minimum Reserve

A. All policies subject to these requirements shall be included in one of the VM-20 Reserving Categories, as specified in Section 2.A.1, Section 2.A.2 and Section 2.A.3 below.

Guidance Note: Since Group Insurance subject to an individual risk selection process and meeting all the requirements, as defined by Section 1.B is subject to VM-20 requirements, Section 2.A shall apply- meaning that any such contracts will be included in one of the VM-20 Reserving Categories defined by Section 2.A.1, Section 2.A.2, and 2.A.3. All requirements in VM-31 which apply to a VM-20 Reserving Category shall apply to any group insurance subject to Individual Underwriting Selection that has been included in that VM-20 Reserving Category.

The company may elect to exclude one or more groups of policies from the stochastic reserve calculation and/or the deterministic reserve calculation. When excluding a group of policies from a reserve calculation, the company must document that the applicable exclusion test defined in Section 6 is passed for that group of policies. The minimum reserve for each VM-20 Reserving Category is defined by Section 2.A.1, Section 2.A.2 and Section 2.A.3, and the total minimum reserve equals the sum of the Section 2.A.1, Section 2.A.2 and Section 2.A.3 results below, defined as:
Refer to NAIC Blanks (E) Working Group, request for modification to the supplemental report for the Life PBR Exemption, to show the premiums for the group life that utilized an individual risk selection process and meets all of the requirements in VM-20 Section 1.B, as these premiums are currently grouped together with other Group Insurance in Exhibit 1. As there are other instances where the ordinary life premiums are not included in the determination of the Life PBR Exemption (e.g., for guaranteed issue policies), it may be useful to request addition of the breakdown of premiums used to determine the exemption.

Possible insertion between questions 1 and 2 for disclosure of premiums used in the determination of eligibility for the Life PBR exemption, split by ordinary life and group subject to an individual risk selection process and meeting all of the requirements in VM-20 Section 1.B.

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<td>2B. State Form(s) (Or)</td>
<td>Complete items “a” and “b,” as appropriate.</td>
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<td>a. Is the insurer in the State Form(s) (Or) different from the NAIC-adopted VM?</td>
<td>Yes [ ] No [ ]</td>
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<td>b. If the answer to “a” shows “Yes,” provide the insurer the state form used to grant the Life PBR Exemption (e.g., Group Endorsement letter) and the minimum reserve requirement that was required by the state of domicile. (If the minimum reserve requirement used the insurer the NAIC-adopted VM, write “NAIC-Adopted VM”.)</td>
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<td>2C. State Expectation (Or)</td>
<td>Complete items “a” and “b,” as appropriate.</td>
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Comment on APF 2019-33

In the exposed draft APF 2019-33, I have question about the intent with regard to the transition period language in Subsection 1: Life Insurance Products F. 1.

Can a company elect to value a certificate using VM-A and VM-C if the group master contract was issued before 1/1/2024 but that individual certificate was issued on or after 1/1/2024? If not, do you believe the transition period language is clear enough regarding that the certificate must also be "issued ... prior to 1/1/2024"?

Thanks for any clarification you can provide.

Stephen Boston
Life Actuary
Pennsylvania Insurance Department
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.

American Academy of Actuaries, Life Reserves Work Group

Addition of language to clarify the definition of individually underwritten life insurance and the applicability of Principle-Based Reserve (PBR) requirements for group insurance contracts with individual risk selection issued under insurance certificates.

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:

January 1, 2020 version of the Valuation Manual used.

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 Appendix

4. State the reason for the proposed amendment? (You may do this through an attachment.)

Individual insurance certificates issued under a group contract which utilize an individual risk selection process, pricing, premium rate structures and product features are similar to individual life insurance policies. They are currently excluded from VM-20 because they are filed under a group contract, but they should be subject to VM-20 due to this similarity. See Appendix.

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Notes: APF 2019-33
Appendix

Issue

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Eight changes are recommended:

1) Within the Reserve Requirements section (Section II), change the minimum reserve requirements to also apply to group life contracts which, other than the difference between issuing a policy and issuing a group certificate, have the same or mostly similar contract provisions, risk selection process and underwriting as individual ordinary life contracts;

2) Within the Reserve Requirements section (Section II), add a transition period for individual group certificates issued on or before 1/1/2024;

3) Within the Reserve Requirements section (Section II), add language to Subsection 1.D and the corresponding footnote to include premiums from group life contracts which have individual certificates that were issued using individual risk selection processes;

4) Add new paragraph, VM-20 Section 1.B (and reformat to make current paragraph Section 1.A) to clarify group life certificates issued using individual risk selection processes, including a definition and requirements to be met, are subject to the requirements of VM-20;

5) Add guidance note after first sentence in VM-20 Section 2.A.1 that group life certificates that meet the definition for individual risk selection process use the same VM-20 Reserving Categories as defined in Section 2;

6) Modify VM-51 Section 2.B to no longer exempt individually solicited group life which meet the requirements and definitions under items (1) and (2) above; and

7) Modify VM-51, Appendix 4, Item 17 to no longer exempt individually solicited group life contracts which meet the requirements under items (1) and (2) above.

8) Draft referral to the NAIC Blanks (E) Working Group, to revise the VM-20 Reserves Supplement, Part 2 to report premiums for total Group Life and Group Life with certificates subjected to an individual risk selection process and which meet all of the conditions as defined in VM-20 Section 1.B separately.

Commented [A1]: Is this a required criterion? If so, then it needs to be listed in VM-20 Section 1.B.
II. Reserve Requirements

This section provides the minimum reserve requirements by type of product, as set forth in the seven subsections below, as follows:

1. Life Insurance Products
2. Annuity Products
3. Deposit-Type Contracts
4. Health Insurance Products
5. Credit Life and Disability Products
6. Riders and Supplemental Benefits
7. Claim Reserves

All reserve requirements provided by this section relate to business issued on or after the operative date of the Valuation Manual. All reserves must be developed in a manner consistent with the requirements and concepts stated in the Overview of Reserve Concepts in Section I of the Valuation Manual.

Guidance Note: The terms “policies” and “contracts” are used interchangeably.

Subsection 1: Life Insurance Products

A. This subsection establishes reserve requirements for all contracts issued on and after the operative date of the Valuation Manual that are classified as life contracts as defined in SSAP No. 50 in the AP&P Manual, with the exception of annuity contracts and credit life contracts. Minimum reserve requirements for annuity contracts and credit life contracts are provided below in subsection 2 and subsection 5, respectively.

B. Minimum reserve requirements for variable and nonvariable individual life contracts—excluding guaranteed issue life contracts, preneed life contracts, industrial life contracts, and policies of companies exempt pursuant to the life PBR exemption in paragraph D below—are provided by VM-20, Requirements for Principle-Based Reserves for Life Products, except for election of the transition period in subsection 1.F below. For this purpose, joint life policies are considered individual life.

C. Minimum reserve requirements for group life contracts with individual certificates which meet all the requirements in VM-20 Section 1.B are provided by VM-20, except for election of the transition period in subsection 1.F below.

D. Minimum reserve requirements of VM-20 are considered principle-based valuation requirements for purposes of the Valuation Manual.

E. Minimum reserve requirements for life contracts not subject to VM-20 are those pursuant to applicable requirements in VM-A and VM-C. For guaranteed issue life contracts issued after Dec. 31, 2018, mortality tables are defined in VM Appendix M – Mortality Tables (VM-M), and the same table shall be used for reserve requirements as is used for minimum nonforfeiture requirements as defined in VM-02, Minimum Nonforfeiture Mortality and Interest.

F. A company may elect to establish minimum reserves pursuant to applicable requirements in VM-A and VM-C for.
1. Business described in subsection 1.C above and issued on or after the operative date of the Valuation Manual and prior to 1/1/2024.

2. Business not described subsection 1.C otherwise subject to VM-20 requirements and issued during the first three years following the operative date of the Valuation Manual.

A company electing to establish reserves using the requirements of VM-A and VM-C may elect to use the 2017 Commissioners’ Standard Ordinary (CSO) Tables as the mortality standard following the conditions outlined in VM-20 Section 3. If a company during the three years elects to apply VM-20 to a block of such business, then a company must continue to apply the requirements of VM-20 for future issues of this business.

E.G. Life PBR Exemption

1. A company meeting the condition in subsection DG.2 below may file a statement of exemption for ordinary life insurance policies including group life insurance certificates subject to an individual risk selection process and meeting all the conditions in VM-20 Section 1.B, except for policies in subsection DG.3 below, issued directly or assumed during the current calendar year, that would otherwise be subject to VM-20. Such a statement must be filed with the domiciliary commissioner prior to July 1 of that year certifying that condition subsection DG.2 was met based on premiums from the prior calendar year annual statement. 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-20 for the ordinary life policies covered by the statement.

2. Condition for Exemption:

The company has less than $300 million of exemption premium, and if the company is a member of an NAIC group of life insurers, the group has combined exemption premium of less than $600 million. Exemption premium is determined as follows:

(a) The amount reported in the prior calendar year life/health annual statement, Exhibit 1, Part 1, Column 3 (“Ordinary Life Insurance”), line 20.1; plus

(b) The portion of the amount in the prior calendar year life/health annual statement, Exhibit 1, Part 1, Column 3 (“Ordinary Life Insurance”), line 20.2 assumed from unaffiliated companies; minus

(c) Amounts included in either (a) or (b) that are associated with guaranteed issue insurance policies and/or preneed life insurance policies; minus

(d) Amounts included in either (a) or (b) that represent transfers of reserves in force as of the effective date of a reinsurance assumed transaction; plus

(e) Amounts of premium for group life certificates that were subject to an individual risk selection process and meet the conditions defined in VM-20, Section 1.B, and that are not included in either (a) or (b).

Guidance Note:
(i) Definitions of preneed and guaranteed issue insurance policy are in VM-01.
(ii) For a statement of exemption filed for calendar year 2022 and beyond, the amount in (e) was reported in the prior calendar year life/health annual statement, VM-20 Reserve Supplement, Part 2, if applicable.
a. The company has less than $300 million of ordinary life premiums, and if the company is a member of an NAIC group of life insurers, the group has combined ordinary life premiums of less than $600 million.

3. Policies Excluded from the Life PBR Exemption:

a. Universal life with secondary guarantee (ULSG) policies with a secondary guarantee that does not meet the VM-01, Definitions for Terms in Requirements, definition of a “non-material secondary guarantee.”

4. Each exemption, or lack of an exemption, applies only to policies issued or assumed in the current year, and it applies to all future valuation dates for those policies. The minimum reserve requirements for the ordinary life policies subject to the exemption are those pursuant to applicable methods required in VM-A and VM-C using the mortality as defined in VM-20 Section 3.C.1 and VM-M Section 1.H.

Footnote change
Premiums are measured as direct plus reinsurance assumed from an unaffiliated company from the ordinary life line of business reported in the prior calendar year life/health annual financial statement, Exhibit 1, Part 1, Column 3, “Ordinary Life Insurance.” Premiums should also include the premiums from group life insurance certificates that were subject to an individual risk selection process and meet all the conditions as defined in VM-20 Section 1.B and for a statement of exemptions filed for calendar year 2022 and beyond, the premiums for these group life certificates were reported in the prior calendar year life health annual financial statement, VM-20 Reserves Supplement, Part 2, if applicable. Premiums should excluding premiums for guaranteed issue policies and preneed life contracts and excluding exclude amounts that represent the transfer of reserves in force as of the effective date of a reinsurance assumed transaction and are reported in Exhibit 1, Part 1, Column 3 as ordinary life insurance premium. Preneed and guaranteed issue life insurance policies are as defined in VM-01.

VM Change 4 – VM-20: Requirements for Principle-Based Reserves for Life Products

VM-20: Requirements for Principles-Based Reserves for Life Products

Section 1: Purpose

A. These requirements establish the minimum reserve valuation standard for individual life insurance policies issued on or after the operative date of the Valuation Manual and subject to a principle-based valuation with an NPR floor under Model #820. These requirements constitute the Commissioners Reserve Valuation Method (CRVM) for policies of individual life insurance.

B. If all of the following requirements are met, individual life certificates under a group contract are subject to the requirements of VM-20, and these requirements constitute the Commissioners Reserve Valuation Method (CRVM) for such certificates.

An individual risk selection process, defined below as follows, is used to obtain group life insurance coverage:

An individual risk selection process is one that is based on characteristics of the insured(s) beyond sex, gender, age, tobacco usage, and membership in a particular group. This may include, but is not limited to,
An individual risk selection process is based on characteristics of the insured(s) beyond sex, gender, age, tobacco usage, and membership in a particular group. This may include, but is not limited to, completion of an application (beyond acknowledgement of membership to the group, sex, gender and age), questionnaire(s), on-line health history or tele-interview to obtain non-medical and medical or health history information, prescription history information, avocations, usage of tobacco, family history, or submission of fluids such as blood, Home Office Specimens (HOS), or oral fluid. The resulting risk classification is determined based on the characteristics of the individual insured(s) rather than the group, if any, of which it is a member (e.g., employer, affinity, etc.). The individual certificate holder is charged a premium rate based solely on the individual risk selection process and not on membership in a specific group.

**Guidance Note:** The use of evidence of insurability does not by itself constitute an individual risk selection process. Use of information obtained from a census or question(s) regarding gender, occupation, age, income and/or tobacco usage solely for purposes of determining a rate classification does not by itself qualify a group as having used an individual risk selection process.

Group insurance where the underwriting is based on the characteristics of the group and census data but where some individuals are subjected to individual risk selection as a result of compensation level, age, an existing medical condition or impairment, late entry into the group, failure of the group to meet minimum participation requirements or voluntary buy-up of increased coverage does not meet the definition of an individual risk selection process.

2. (ii) The individual certificates utilize premiums or cost of insurance schedules and charges based on the individual applicant’s issue age, duration from underwriting, coverage amount and risk classification and there is a stated or implied schedule of maximum gross premiums or net cash surrender value required in order to continue coverage in force for a period in excess of one year;

3. (iii) The group master contract is designed, priced, solicited, and managed similar to individual ordinary life insurance policies rather than specific to the group as a whole;

4. (iv) The individual certificates have similar acquisition approaches, provisions, certificate-holder rights, pricing, and risk classification as individual ordinary life insurance contracts.

5. (v) The group master contract and individual certificates are issued on or after the operative date of the Valuation Manual and subject to a principle-based valuation with an NPR floor under Model #820.

An individual risk selection process is based on characteristics of the insured(s) beyond sex, gender, age, tobacco usage, and membership in a particular group. This may include, but is not limited to, completion of an application (beyond acknowledgement of membership to the group, sex, gender and age), questionnaire(s), on-line health history or tele-interview to obtain non-medical and medical or health history information, prescription history information, avocations, usage of tobacco, family history, or submission of fluids such as blood, Home Office Specimens (HOS), or oral fluid. The resulting risk classification is determined based on the characteristics of the individual insured(s) rather than the group, if any, of which it is a member (e.g., employer, affinity, etc.). The individual certificate holder is charged a premium rate based solely on the individual risk selection process and not on membership in a specific group.

Commented [A11]: Renumber

Commented [A12]: Renumber

Commented [A13]: Renumber

Commented [A14]: Renumber

Commented [A15]: Delete. This results from meeting the criteria; it should not be a criterion.

Commented [A16]: Moved to a location which allows reference.
**Guidance Note:** The use of evidence of insurability does not by itself constitute an individual risk selection process. Use of information obtained from a census or question(s) regarding gender, occupation, age, income and/or tobacco usage solely for purposes of determining a rate classification does not by itself qualify a group as having used an individual risk selection process. Group insurance where the underwriting is based on the characteristics of the group and census data but where some individuals are subjected to individual risk selection as a result of compensation level, age, an existing medical condition or impairment, late entry into the group, failure of the group to meet minimum participation requirement or voluntary buy-up of increased coverage does not meet the definition of an individual risk selection process.
Section 2: Minimum Reserve

A. All policies subject to these requirements shall be included in one of the VM-20 Reserving Categories, as specified in Section 2.A.1, Section 2.A.2 and Section 2.A.3 below.

Guidance Note: Since group insurance subject to an individual risk selection process and meeting all the requirements, as defined by in Section 1.B is subject to VM-20 requirements, Section 2.A shall apply—meaning that any such contracts will be included in one of the VM-20 Reserving Categories defined by Section 2.A.1, Section 2.A.2, and 2.A.3. All requirements in VM-31 which apply to a VM-20 Reserving Category shall apply to any group insurance subject to individual Underwriting-risk Selection selection that has been included in that VM-20 Reserving Category.

The company may elect to exclude one or more groups of policies from the stochastic reserve calculation and/or the deterministic reserve calculation. When excluding a group of policies from a reserve calculation, the company must document that the applicable exclusion test defined in Section 6 is passed for that group of policies. The minimum reserve for each VM-20 Reserving Category is defined by Section 2.A.1, Section 2.A.2 and Section 2.A.3 results below, defined as:
Life Actuarial (A) Task Force
Virtual Meeting
February 4, 2021

The Life Actuarial (A) Task Force met Feb. 4, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Tynesia Dorsey, Vice Chair, represented by Peter Weber (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Jennifer Li (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV).

1. Exposed Amendment Proposal 2020-12

Ms. Hemphill said amendment proposal 2020-12 (Attachment Five-A) provides Valuation Manual edits to make the definition of the term “clearly defined hedging strategy” (CDHS) in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, consistent with the definition used in VM-20, Requirements for Principle-Based Reserves for Life Products. She said the definition is also applicable to the principle-based version of VM-22, Statutory Maximum Valuation Interest Rates for Income Annuities, currently in development. She noted that the amendment proposal moves the revised definition from VM-20 to VM-01, Definitions for Terms in Requirements. She said the amendment additionally proposes defining a new term, “seasoned hedging strategy” (SHS), which prevents companies from avoiding CDHS requirements by opting to fail one of the qualifying CDHS criteria. The SHS requirements mandate the modeling of an SHS that would increase the minimum reserve or total asset requirement (TAR). Ms. Hemphill also presented coordinating revisions to Statement of Statutory Accounting Principles (SSAP) 108—Derivatives Hedging Variable Annuity Guarantees (Attachment Five-B). The coordinating revisions will be forwarded to the Statutory Accounting Principles (E) Working Group following the Task Force adoption of amendment proposal 2020-12.

Mr. Robinson made a motion, seconded by Mr. Leung, to expose amendment proposal 2020-12 for a 50-day public comment period ending March 26. The motion passed unanimously.

2. Exposed Amendment Proposal 2020-13

Ms. Hemphill said amendment proposal 2020-13 (Attachment Five-C) revises the VM-20 starting asset collar parameters to correctly apply the collar to a modeled reserve that is negative.

Mr. Weber made a motion, seconded by Mr. Leung, to expose amendment proposal 2020-13 for a 21-day public comment period ending February 26. The motion passed unanimously.

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

Identification:
Rachel Hemphill and Karen Jiang, Texas Department of Insurance

Title of the Issue:
Create consistency between CDHS determination in VM-20 and VM-21. Revise hedge modeling to only require CDHS if modeling future hedging reduces the reserves under VM-20 or TAR under VM-21.

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:


January 1, 2021 NAIC Valuation Manual

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.)

We propose having consistent requirements for a CDHS in VM-20 and VM-21, as well as any future work on VM-22, and consolidating these requirements in the VM-01 definition of a CDHS. This involves adding two criteria to VM-21’s definition of CDHS that currently exist for VM-20:

- Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
- The circumstances under which hedging strategy will not be effective in hedging the risks.

These criteria are both reasonable and apply in principle to VM-21, and to any future work on VM-22, as well as VM-20.

Further, we propose revising the requirement for hedging to be a CDHS in order for future hedging to be modeled under VM-20, VM-21, and LR027’s C-3 RBC Amount calculation to only apply when modeling such hedging reduces the life reserve level or variable annuity Total Asset Requirement (TAR) level.

The current regulatory requirements for hedging to be a CDHS in order for future hedging to be modeled under VM-20, modeled under VM-21, modeled for the C-3 RBC Amount calculation for variable annuities,
and to be eligible for SSAP 108 treatment are all logical requirements when one considers whether hedging should be allowed to reduce the life reserve level or variable annuity TAR level, or whether any mismatch between movements in hedge assets and movements in the corresponding reserve levels should be allowed to be amortized over time.

However, this same requirement has led to a situation of there being unintended optionality in whether a hedging strategy that is like a CDHS is modeled or is not modeled, since a company may choose to satisfy or not satisfy certain of the criteria. This has been especially relevant for cases where modeling a company’s hedging strategy would increase reserves or variable annuity TAR.

As noted in the current guidance note in VM-20 Section 7.K.1 in the 2021 Valuation Manual:

“The prohibition in these modeled reserve requirements against projecting future hedging transactions other than those associated with a clearly defined hedging strategy is intended to address initial concerns expressed by various parties that reserves could be unduly reduced by reflection of programs whose future execution and performance may have greater uncertainty. The prohibition appears, however, to be in conflict with Principle 2 listed in VM-21. Companies may actually execute and reflect in their risk assessment and evaluation processes hedging strategies similar in many ways to clearly defined hedging strategies but lack sufficient clarity in one or more of the qualification criteria. By excluding the associated derivative instruments, the investment strategy that is modeled may also not reflect the investment strategy the company actually uses. Further, because the future hedging transactions may be a net cost to the company in some scenarios and a net benefit in other scenarios, the exclusion of such transactions can result in a modeled reserve that is either lower or higher than it would have been if the transactions were not excluded. The direction of such impact on the reserves could also change from period to period as the actual and projected paths of economic conditions change. A more graded approach to recognition of non-qualifying hedging strategies may be more theoretically consistent with Principle 2. It is recommended that as greater experience is gained by actuaries and state insurance regulators with the principle-based approach and as industry hedging programs mature, the various requirements of this section be reviewed.”

We propose to continue addressing the regulatory concern that reserves could be unduly reduced by reflection of programs whose future execution and performance may have greater uncertainty, by continuing to only allowing hedging strategies that qualify as a CDHS to reduce life reserves and variable annuity TAR. However, we propose that the treatment of CDHS be made more principles-based and less subject to manipulation. To accomplish this, the proposal requires that any hedging strategy that is a part of the investment strategy supporting the policies and is normally modeled as part of the company’s risk assessment and evaluation processes be modeled as if it were a CDHS if doing so results in an increase in life reserves or variable annuity TAR.

That is, CDHS becomes a requirement solely for hedging strategies that reduce life reserves or variable annuity TAR, and so becomes a more clear regulatory guardrail requiring that hedging strategies that reduce life reserves or variable annuity TAR must be clearly defined.

We continue to need the concept of a CDHS. A CDHS simply formally documents items that a company should be able to document for a robust, well-defined hedging strategy. It requires that the following be identified:

a. The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
b. The hedge objectives.
c. The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other 
utilization or decrement rates assumed in the hedging strategy, etc.).
d. The financial instruments used to hedge the risks.
e. The hedge trading rules, including the permitted tolerances from hedging objectives.
f. The metrics for measuring hedging effectiveness.
g. The criteria used to measure hedging effectiveness.
h. The frequency of measuring hedging effectiveness.
i. The conditions under which hedging will not take place.
j. The person or persons responsible for implementing the hedging strategy.
k. Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
l. The circumstances under which hedging strategy will not be effective in hedging the risks.

While the last two criteria have historically applied for life but not variable annuities, these are all 
reasonable documentation items that for a robust, well-defined hedging strategy regardless of whether the 
product is life or variable annuity.

The concept of a CDHS is used for accounting in SSAP 108. SSAP 108 allows companies to set up a 
defered asset or liability to amortize the mismatch between changes in the value of the liability and changes 
in the value of the hedging instruments attributable to the hedged risk underlying a highly effective CDHS 
modeled for VM-21. Allowing this treatment encourages companies to reduce risk through robust, well-
de ned and highly effective hedging. Without having the hedging strategy be well-defined, regulators 
could not rely on past effectiveness being indicative of future effectiveness, and so could not offer 
companies the benefit of SSAP 108 treatment. Once we recognize the need for a concept of a well-defined 
hedging strategy, the only question is what criteria would need to be met to be considered well-defined – 
that is, what criteria should be required to be considered a CDHS. This is a distinct question from whether 
the concept of a CDHS is needed. We have not heard critiques of individual criteria in the CDHS definition, 
but consideration of the criteria is appropriate as we go forward to make the definitions in VM-20 and VM-
21 consistent. Similarly, in reserve and capital calculations, we rely on the concept of historical 
effectiveness to determine an error factor. If modeling hedging reduces the reserve or capital amount, the 
error factor determines the magnitude to which this is reflected. However, this use of the historical 
effectiveness relies on the hedging strategy being well-documented and comparable between historical 
hedging and planned future hedging. So, again, a need for hedging strategies to be well-defined presents 
itself – a CDHS concept is needed.

Finally, edits to VM-31 are needed to reflect these updates and bring VM-20 and VM-21 reporting 
requirements more in line with one another where appropriate.

Note on Coordination with RBC and APPM: We have reviewed, and with these edits there are no 
corresponding edits necessary for LR027 for RBC but corresponding edits are necessary for SSAP 108. A 
referral to SAPWG is to be concurrently considered with this APF.

* 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.

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**VM-01**

- The term “clearly defined hedging strategy” (CDHS) means a strategy undertaken by a company to manage risks through the future purchase or sale of hedging instruments and the opening and closing of hedging positions. A CDHS must identify:
  
a. The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
b. The hedge objectives.
c. The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
d. The financial instruments used to hedge the risks.
e. The metrics for measuring hedging effectiveness.
f. The criteria used to measure hedging effectiveness.
g. The frequency of measuring hedging effectiveness.
h. The conditions under which hedging will not take place.
i. The person or persons responsible for implementing the hedging strategy.
j. The circumstances under which hedging strategy will not be effective in hedging the risks.

The hedge strategy may be dynamic, static or a combination thereof. A strategy involving the offsetting of the risks associated with products falling under the scope of different requirements within the *Valuation Manual* (e.g., VM-20, VM-21, or VM-22) does not qualify as CDHS. A CDHS must meet all of the principles outlined in VM-21 Section 1.B (the most relevant of which may be Principle 5).

**Guidance Note:** For purposes of the above criteria, “effectiveness” need not be measured in a manner as defined in SSAP No. 86—Derivatives in the AP&P Manual.

- The term “Seasoned Hedging Strategy” (SHS) means a hedging strategy that is part of the company’s investment strategy and is normally modeled as part of the company’s risk assessment and evaluation process. A SHS may or may not be a CDHS.

The hedge strategy may be dynamic, static or a combination thereof. A strategy involving the offsetting of the risks associated with products falling under the scope of different requirements within the *Valuation Manual* (e.g., VM-20, VM-21, or VM-22) does not qualify as SHS. A SHS must meet all of the principles outlined in VM-21 Section 1.B (the most relevant of which may be Principle 5).
**VM-20 Section 6.A.1.b**

A company may not exclude a group of policies for which there is one or more CDHS or one or more SHS required to be modeled pursuant to Section 7.K.4 from stochastic reserve requirements, except in the case where all CDHS and all SHS required to be modeled pursuant to Section 7.K.4 are solely associated with product features that are determined to not be material under Section 7.B.1 due to low utilization.

**VM-20 Section 7.E.1.g**

Notwithstanding the above requirements, the modeled reserve shall be the higher of that produced by the model 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 model 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 50% PBR credit rating 6 (A2/A) and 50% PBR credit rating 3 (Aa2/AA).

Policy loans, equities and derivative instruments associated with the execution of a CDHS (in compliance with the definition of CDHS in VM-01) or a SHS that is required to be modeled pursuant to Section 7.K.4 are not affected by this requirement.

**VM-20 Section 7.K**

**K. Modeling of Derivative Programs**

1. When determining the deterministic reserve and the stochastic reserve, the company shall include in the projections the appropriate costs and benefits of derivative instruments that are currently held by the company in support of the policies subject to these requirements. The company shall also include the appropriate costs and benefits of anticipated future derivative instrument transactions associated with the execution of a CDHS or a SHS that is required to be modeled pursuant to Section 7.K.4, as well as the appropriate costs and benefits of anticipated future derivative instrument transactions associated with non-hedging derivative programs (e.g., replication, income generation) undertaken as part of the investment strategy supporting the policies, provided they are normally modeled as part of the company’s risk assessment and evaluation processes.

2. For each derivative program that is modeled, the company shall reflect the company’s established investment policy and procedures for that program; project expected program performance along each scenario; and recognize all benefits, residual risks and associated frictional costs. The residual risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, etc.). Frictional costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. For CDHS or SHS required to be modeled pursuant to Section 7.K.4, the company may not assume that residual risks and frictional costs have a value of zero, unless the company demonstrates in the PBR Actuarial Report that “zero” is an appropriate expectation.
3. In circumstances where one or more material risk factors related to a derivative program are not fully captured within the cash-flow model used to calculate CTE 70, the company shall reflect such risk factors by increasing the stochastic reserve as described in Section 5.E.

4. If a SHS is not a CDHS but modeling it would result in an increase to the company’s minimum reserve, then the company shall model the SHS as if it were a CDHS when calculating reserves under VM-20.

**VM-20 Section 7.L (Remove entire Section 7.L)**

- **Deleted:** L. Clearly Defined Hedging Strategy
  - A clearly defined hedging strategy must identify:
    - The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
    - The hedge objectives.
    - The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
    - The financial instruments used to hedge the risks.
    - The hedge trading rules, including the permitted tolerances from hedging objectives.
    - The metrics for measuring hedging effectiveness.
    - The criteria used to measure hedging effectiveness.
    - The frequency of measuring hedging effectiveness.
    - The conditions under which hedging will not take place.
    - The person or persons responsible for implementing the hedging strategy.
    - Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
    - The circumstances under which hedging strategy will not be effective in hedging the risks.
  - Hedging strategies involving the offsetting of the risks associated with other products outside of the scope of these requirements is not a clearly defined hedging strategy.

- **Guidance Note:** For purposes of the above criteria, “effectiveness” need not be measured in a manner as defined in SSAP No. 86—Derivatives in the AP&P Manual.
VM-21 Section 1.D.2 (Delete entire definition and renumber subsequent sections VM-21 Section 1.D.3 and VM-21 Section 1.D.4)

VM-21 Section 4.A.4

Modeling of Hedges

a. For a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6:
   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 with a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6, the detailed requirements for the modeling of hedges are defined in Section 9. The following paragraphs are a high-level summary and do not supersede the detailed requirements.

i. 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.

ii. The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of the CDHS or the SHS that is required to be modeled pursuant to Section 9.A.6. 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 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 no future hedge purchases. These are discussed in greater detail in Section 9. The stochastic reserve

Deleted: The term “clearly defined hedging strategy” (CDHS) is defined in VM-01. In order to be designated as a CDHS, the strategy must meet the principles outlined in Section 1.B (particularly Principle 5) and shall, at a minimum, identify:

- The specific risks being hedged (e.g., delta, rho, vega, etc.).
- The hedge objectives.
- The risks not being hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
- The financial instruments that will be used to hedge the risks.
- The hedge trading rules, including the permitted tolerances from hedging objectives.
- The metric(s) for measuring hedging effectiveness.
- The criteria that will be used to measure hedging effectiveness.
- The frequency of measuring hedging effectiveness.
- The conditions under which hedging will not take place.
- The person or persons responsible for implementing the hedging strategy.

Guidance Note: It is important to note that strategies involving the offsetting of the risks associated with VA guarantees with other products outside of the scope of these requirements (e.g., equity-indexed annuities) do not currently qualify as a clearly defined hedging strategy under these requirements.
shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E) determined following the guidance of Section 9.C.4.

iii. The company is responsible for verifying compliance with CDHS requirements, or SHS requirements if required to be modeled pursuant to Section 9.A.6, and any other requirements in Section 9 for all hedging instruments included in the projections.

iv. The use of products not falling under the scope of these requirements (e.g., equity-indexed annuities) as a hedge shall not be recognized in the determination of accumulated deficiencies.

VM-21 Section 4.D.4.b

Notwithstanding the above requirements, the model 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 by substituting an alternative investment strategy in which all fixed income reinvestment assets are 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 50% PBR credit rating 6 (A2/A) and 50% PBR credit rating 3 (Aa2/AA).

Policy loans, equities and derivative instruments associated with the execution of a CDHS (in compliance with the definition of CDHS in VM-01) or a SHS that is required to be modeled pursuant to Section 9.A.6 are not affected by this requirement.

VM-21 Section 6.B.3.a.ii – Footnote (Footnote at Bottom of Page 21-22)

Throughout this Section 6, references to CTE70 (adjusted) shall also mean the Stochastic Reserve for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6 as discussed in Section 4.A.4.a.

VM-21 Section 6.B.3.b.ii

Calculate the Prescribed Projections Amount as the CTE70 (adjusted) using the same method as that outlined in Section 9.C (which is the same as the stochastic reserves following Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6) but substituting the assumptions prescribed by Section 6.C. The calculation of this Prescribed Projections Amount also requires that the scenario reserve for any given scenario be equal to or in excess of the cash surrender value in aggregate on the valuation date for the group of contracts modeled in the projection.

VM-21 Section 6.B.5

Cash flows associated with hedging shall be projected in the same manner as that used in the calculation of the CTE70 (adjusted) as discussed in Section 9.C or Section 4.A.4.a for a company without a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6.
VM-21 Section 9

Section 9: Modeling of Hedges under a CDHS

A. Initial Considerations

1. Subject to Section 9.C.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, determined in accordance with Section 3.D and Section 4.D.

2. If the company is following a CDHS, in accordance with an investment policy adopted by the board of directors, or a committee of board members, 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 based on the execution of the hedging strategy, and it is eligible to reduce the amount of the stochastic reserve using projections otherwise calculated. The investment policy must clearly articulate the company’s hedging objectives, including the metrics that drive rebalancing/trading. This specification could include maximum tolerable values for investment losses, earnings, volatility, exposure, etc. in either absolute or relative terms over one or more investment horizons vis-à-vis the chance of occurrence. Company management is responsible for developing, documenting, executing and evaluating the investment strategy, including the hedging strategy, used to implement the investment policy.

3. 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.

4. 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.

5. Before either a new or revised hedging strategy can be used to reduce the amount of the stochastic reserve otherwise calculated, the hedging strategy should be in place (i.e., effectively implemented by the company) for at least three months. The company may meet the time requirement by having evaluated the effective implementation of the hedging strategy for at least three months without actually having executed the trades indicated by the hedging strategy (e.g., mock testing or by having effectively implemented the strategy with similar annuity products for at least three months).

6. If a SHS is not a CDHS but modeling it as if it were a CDHS would result in an increase in the company’s TAR, then the company shall model the SHS as if it were a CDHS when calculating reserves under AG43 and/or VM-21 and when calculating the C-3 RBC Amount under LR027. The company shall not treat the SHS as a CDHS for purposes of SSAP 108.
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 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.

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 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 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 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.

5. A safe harbor approach is permitted for CDHS reflection 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 (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the CDHS (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 CDHS
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 CDHS, therefore following the requirements of Section 4.A.4.a.

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 is given by:

\[ \text{Stochastic reserve} = \text{CTE70 (best efforts)} + E \times \max[0, \text{CTE70 (adjusted)} – \text{CTE70 (best efforts)}] \]

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 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 strategy 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 no history, E should be at least 0.50. However, E may be lower than 0.50 if some reliable experience is available and/or if the change in strategy is a refinement rather than a substantial 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., ≥ 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 CDHS 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).

D. 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 stochastic reserve 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.

E. 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, 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 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 variable annuity 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 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, 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 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.

VM-31 Section 3.C.5

**Assets and Risk Management** – A brief description of the asset portfolio, and the approach used to model risk management strategies, such as hedging, and other derivative programs, including a description of any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4.

Deleted: clearly defined hedging strategies

VM-31 Section 3.D.6.f

**Risk Management** – Detailed description of model risk management strategies, such as hedging and other derivative programs specific to the groups of policies covered in this sub-report and not discussed in the Life Summary Section 3.C.5. This should include documentation for any hedging strategy that meets the requirements to be a CDHS. It should also include, for any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4, documentation of any CDHS criteria met, listing of CDHS criteria not met, and documentation of the reserve level with and without the SHS being modeled as if it were a CDHS.

Deleted: , including any clearly defined hedging strategies


a. **Investment Officer on Investments** – A certification from a duly authorized investment officer that the modeled company investment strategy including any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4, is representative of and consistent with the company’s investment policy.

b. **Qualified Actuary on Investments** – A certification by a qualified actuary, not necessarily the same qualified actuary that has been assigned responsibility for the PBR Actuarial Report or this sub-report, that the modeling of any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4 was performed in accordance with VM-20 and in compliance with all applicable ASOPs, and the alternative investment strategy as defined in VM-20 Section 7.E.1.g reflects the prescribed mix of assets with the same WAL as the reinvestment assets in the company investment strategy.

Deleted: clearly defined hedging strategies
VM-31 Section 3.E.5

Assets and Risk Management – A brief description of the general account asset portfolio, and the approach used to model risk management strategies, such as hedging and other derivative programs, including a description of any CDHS or any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, and any material changes to the hedging strategy from the prior year.

VM-31 Section 3.F.8

Hedging and Risk Management – The following information regarding the hedging and risk management assumptions used by the company in performing a principle-based valuation under VM-21:

a. Strategies – Detailed description of risk management strategies, such as hedging and other derivative programs, including any CDHS or any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, specific to the groups of contracts covered in this sub-report.
   i. Descriptions of basis risk, gap risk, price risk and assumption risk.
   ii. Methods and criteria for estimating the a priori effectiveness of the strategy.
   iii. Results of any reviews of actual historical hedging effectiveness.

b. CDHS – Documentation for any hedging strategy that meets the requirements to be a CDHS.

c. Other Modeled Hedging Strategies – Documentation for any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, including documentation of any CDHS criteria met, listing of CDHS criteria not met, and documentation of the TAR level with and without the SHS being modeled as if it were a CDHS.

d. Strategy Changes – Discussion of any changes to the hedging strategy during the past 12 months, including identification of the change, reasons for the change, and the implementation date of the change.

e. Hedge Modeling – Description of how the hedge strategy was incorporated into modeling, including:
   i. Differences in timing between model and actual strategy implementation.
   ii. For a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, disclosure of the method used to consider hedge assets included in the starting assets, either (1) including the asset cash flows in the projection model; or (2) replacing the hedge positions with cash and/or other general account assets in an amount equal to the market value of the hedge positions, as discussed in VM-21 Section 4.A.4.a.
   iii. Evaluations of the appropriateness of the assumptions on future trading, transaction costs, other elements of the model, the strategy, and other items that are likely to result in materially adverse results.
   iv. If residual risks and frictional costs are assumed to have a value of zero, a demonstration that a value of zero is an appropriate expectation.
   v. Any discontinuous hedging strategies modeled, and where such discontinuous hedging strategies contribute materially to a reduction in the stochastic reserve, any evaluations of the interaction of future trigger definitions and the discontinuous hedging strategy, including any analyses of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

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vi. Disclosure of any situations where the modeled hedging strategies make money in some scenarios without losing a reasonable amount in some other scenarios, and an explanation of why the situations are not material for determining the CTE 70 (best efforts).

vii. Results of any testing of the method used to determine prices of financial instruments for trading in scenarios against actual initial market prices, including how the testing considered historical relationships. If there are substantial discrepancies, disclosure of the substantial discrepancies and documentation as to why the model-based prices are appropriate for determining the stochastic reserve.

viii. Any model adjustments made when calculating CTE 70 (adjusted), in particular, any liquidation or substitution of assets for currently held hedges.

e. Error Factor ($E$) and Back-Testing – Description of $E$, the error factor, and formal back-tests performed, including:
   i. The value of $E$, and the approach and rationale for the value of $E$ used in the reserve calculation.
   ii. For companies that model hedge cash flows using the explicit method, as described in VM-21 Section 9.C.6.a, and have 12 months of experience, an analysis of at least the most recent 12 months of experience and the results of a back-test showing that the model is able to replicate the hedging results experienced in a way that justifies the value used for $E$. Include at least a ratio of the actual change in market value of the hedges to the modeled change in market value of the hedges at least quarterly.
   iii. For companies that model hedge cash flows using the implicit method, and have 12 months of experience, as described in VM-21 Section 9.C.6.b, the results of a back-test in which (a) actual hedge asset gains and losses are compared against (b) proportional fair value movements in hedged liability, including:
      a) Delta, rho and vega coverage ratios in each month over the back-testing period, which may be presented in a chart or graph.
      b) The implied volatility level used to quantify the fair value of the hedged item, as well as the methodology undertaken to determine the appropriate level used.
   iv. For companies that do not model hedge cash flows using either the explicit method or the implicit method, as described in VM-21 Section 9.C.6.c, and have 12 months of experience, the results of the formal back-test conducted to validate the appropriateness of the selected method and value used for $E$.
   v. For companies that do not have 12 months of experience, the basis for the value of $E$ is chosen based on the guidance provided in VM-21 Section 9.C.7, considering the actual history available and the degree and nature of any changes made to the hedge strategy.

f. Safe Harbor for CDHS – If electing the safe harbor approach for CDHS, as discussed in VM-21 Section 9.C.8, a description of the linear instruments used to model the option portfolio.

g. Hedge Model Results – Disclosure of whether the calculated CTE 70 (best efforts) is below both the fair value and CTE 70 (adjusted), and if so, justification for why that result is reasonable, as discussed in VM-21 Section 9.D.

**VM-31 Section 3.F.12.c**

CTEPA – If using the CTEPA method, a summary including:

i. Disclosure (in tabular form) of the scenario reserves using the same method and assumptions as those used by the company to calculate CTE 70 (adjusted) as outlined in VM-21 Section 9.C (or the stochastic reserves...
following VM-21 Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-21 Section 9.A.6), as well as the corresponding scenarios reserves substituting the assumptions prescribed by VM-21 Section 6.C.

ii. Summary of results from a cumulative decrement projection along the scenario whose reserve value is closest to the CTE 70 (adjusted), as outlined in VM-21 Section 9.C (or the stochastic reserves following VM-21 Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-21 Section 9.A.6), under the assumptions outlined in VM-21 Section 6.C. Such a cumulative decrement projection shall include, at the end of each projection year, the projected proportion (expressed as a percent of the total projected account value) of persisting contracts as well as the allocation of projected decrements across death, full surrender, account value depletion, elective annuitization, and other benefit election.

iii. Summary of results from a cumulative decrement projection, identical to (ii) above, but replacing all assumptions outlined in VM-21 Section 6.C with the corresponding assumptions used in calculating the stochastic reserve.

**VM-31 Section 3.F.16.a and Section 3.F.16.b**

a. **Investment Officer on Investments** – A certification from a duly authorized investment officer that the modeled asset investment strategy, including any CDHS and any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, is consistent with the company’s current investment strategy except where the modeled reinvestment strategy may have been substituted with the alternative investment strategy, and also any CDHS meets the requirements of a CDHS.

b. **Qualified Actuary on Investments** – A certification by a qualified actuary, not necessarily the same qualified actuary that has been assigned responsibility for the PBR Actuarial Report or this sub-report, that the modeling of any CDHS and any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6 was performed in accordance with VM-21 and in compliance with all applicable ASOPs.

Deleted: clearly defined hedging strategies
TO: Dale Bruggeman (OH), Chair of the Statutory Accounting Principles (E) Working Group
FROM: Mike Boerner, (TX), Chair of the Life Actuarial (A) Task Force
DATE: February 4, 2021
RE: Clearly Defined Hedging Strategy (CDHS) Requirements

This referral has been provided to notify the Working Group of revisions to the Valuation Manual being considered by the Life Actuarial (A) Task Force during the 2/4/2021 Meeting on APF 2020-12, regarding CDHS. The proposed revisions in APF 2020-12 would require an update to SSAP 108 to maintain consistency between the Valuation Manual and the Accounting Practices and Procedures Manual.

APF 2020-12 under consideration by Life Actuarial (A) Task Force:

1) Moves the definition of a CDHS from VM-21 to VM-01;
2) Adds two criteria from the VM-20 CDHS definition that had not been in the VM-21 CDHS definition to the final definition in VM-01 that applies to both VM-20 and VM-21;
3) Requires that companies model hedging strategies that do not meet the definition of a CDHS under VM-21 if they increase TAR. However, it is noted in the Valuation Manual that this does not impact the treatment of such non-CDHS hedging strategies under SSAP 108.

For coordination between the Valuation Manual and the Accounting Practices and Procedures Manual, proposed edits to SSAP 108 are shown in the attached Appendix. Please contact NAIC staff of the Life Actuarial (A) Task Force with any questions on this proposal. Also attached is a copy of LATF APF 2020-12.

cc Julie Gann, Robin Marcotte, Dave Fleming, Reggie Mazyck, Pat Allison
Proposed edit to SSAP 108, Paragraph 6.b.ii

Certification by a financial officer of the company (CFO, treasurer, CIO, or designated person with authority over the actual trading of assets and derivatives) that the hedging strategy meets the definition of a Clearly Defined Hedging Strategy within VM-01 and that the Clearly Defined Hedging Strategy is the hedging strategy being used by the company in its actual day-to-day risk mitigation efforts. This provision does not require reporting entities to use a hedging strategy in determining VM-21 reserves, nor does it require entities to use the special accounting provision within this standard. However, it does require reporting entities that use the special accounting provisions within this standard to certify that the hedging strategy within scope of this standard is a Clearly Defined Hedging Strategy and is reflected in the establishment of VM-21 reserves.

Proposed edit to SSAP 108, Paragraph 7

As identified in paragraph 2, eligibility for the special accounting provision within this standard is strictly limited to variable annuity contracts and other contracts involving certain guaranteed benefits similar to those offered with variable annuities that are reserved for in accordance with VM-21. This special accounting provision requires the reporting entity to engage in highly effective fair value hedges that follow a Clearly Defined Hedging Strategy, as defined in VM-01, meeting all required provisions of VM-21 allowing the reporting entity to reduce the amount of the Conditional Tail Expectation (CTE) Amount. In order to qualify as a Clearly Defined Hedging Strategy (which may be dynamic, static, or a combination thereof), the strategy must meet the principles outlined in VM-21, be in place (implemented) for at least three months, and shall at a minimum, identify:

a. Specific risks being hedged,
b. Hedge objectives,
c. Risks not being hedged,
d. Financial instruments that will be used to hedge the risks,
e. Hedge trading rules, including permitted tolerance terms from hedging objectives,
f. Metric(s) used for measuring hedging effectiveness,
g. Criteria that will be used to measure effectiveness,
h. Frequency of measuring hedging effectiveness,
i. Conditions under which hedging will not take place,
j. The individuals responsible for implementing the hedging strategy,
k. Areas where basis, gap or assumption risk related to the hedging strategy have been identified, and
l. The circumstances under which hedging strategy will not be effective in hedging the risks.

Proposed edit to SSAP 108, Paragraph 23.a

Discussion of hedged item, including information on the guarantees sensitive to interest rate risk, along with information on the designated hedging instruments being used to hedge the risk. Discussion of the hedging instruments shall identify whether a hedging instrument is a single instrument or portfolio, as well as information on the hedging strategy (including whether there have been changes in strategy from the prior reporting period, along with detailed information on the changes), assessment of hedging effectiveness and compliance with the “Clearly Defined Hedging Strategy” of VM-01. Identification shall occur on whether the hedged item is intended to be fully hedged under the hedging strategy, or if the strategy is only focused on a portion of the liability characteristics or a portion of the interest rate sensitivity. Hedging strategies shall be identified as highly effective or not highly effective. If the strategy for a particular hedging relationship excludes a specific component of the gain or loss, or related cash flows, from the assessment of hedge effectiveness, details on the excluded components shall be disclosed.
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.

Identification:
Dany Provencher, Appointed Actuary, Industrial Alliance group of companies

Title of the issue:
Asset collar when modeled reserve is negative

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:

VM-20 Section 7.D.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.)

If for all model segments combined, the aggregate annual statement value of the final starting assets, less the corresponding PIMR balance, is
(a) less than 98% of modeled reserve; or
   (i) 98% of the modeled reserve if modeled reserve is positive;
   (ii) 102% of the modeled reserve if modeled reserve is negative; or
(b) greater than the largest of:
   (i) 102% of the modeled reserve;
   (ii) the NPR for the same set of policies, net of due and deferred premiums thereon:
       and
   (iii) zero,
then the company shall provide documentation in the PBR Actuarial Report that provides reasonable assurance that the modeled reserve is not materially understated as a result of the estimate of the amount of starting assets.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

If modeled reserve is negative, using assets corresponding to 100% of modeled reserve, would not fall within the asset collar.

* 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.
The Life Actuarial (A) Task Force met Jan. 28, 2021. The following Task Force members participated: Doug Slape, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Tynesia Dorsey, Vice Chair, represented by Peter Weber (OH); Lori K. Wing-Heier represented by Sharon Comstock (AK); Jim L. Ridling represented by Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Muleady represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV).

1. Discussed the Questions on the ESG Exposures

Scott O’Neal (NAIC) discussed items related to the economic scenario generator (ESG). He said the revised ESG timeline (see the Jan. 21 Task Force minutes) is posted on the Related Documents tab on the Task Force webpage. He said the public comment period for the Initial ESG Recommendation has been extended to March 7. He noted that an addendum was added to the exposure to indicate the extended comment period and provide clarifying information about the industry field test. He gave a reminder that ESG scenario statistics and reports, the scenario picker tool, and the stochastic exclusion test scenarios are exposed for a public comment period ending March 7.

Mr. O’Neal discussed the ESG question and answer (Q&A) document being developed by NAIC actuarial staff to capture and respond to the questions submitted by industry members. He said references to the submitted questions have been removed. The Q&A document will be posted on the Conning website. Randall McCumber (Lincoln Financial Group) asked when Conning expects to provide revised scenarios that fix the issue with the short end of the yield curve and when the actual scenarios for the Valuation Manual (VM)-20, Requirements for Principle-Based Reserves for Life Products, Stochastic Exclusion Ratio Test (SERT) will be available. Mr. O’Neal said NAIC staff and Conning are working to produce and evaluate additional scenario sets, and they will provide them as soon as possible. Dan Finn (Conning) said the SERT scenarios should be available in two weeks. Mr. McCumber asked if the deterministic reserve (DR) would still be linked to the same SERT scenario from the new ESG. Pat Allison (NAIC) said that is still the case. Mr. McCumber asked what scenario data companies will receive for the field test. Ms. Allison said it will probably include both the full set of 10,000 scenarios and a smaller subset of scenarios. Connie Tang (Prudential) asked if additional statistics and reports could be provided when the scenarios are released. Ms. Allison expressed openness to receiving feedback on specific statistics that industry members would like to see. Brian Bayerle (American Council of Life Insurer—ACLI) and Jason Kehrberg (American Academy of Actuaries—Academy) communicated that having additional documentation as soon as possible will facilitate the development of better questions from industry. Mr. Boerner said any existing documentation questions should be submitted as soon as possible.

2. Discussed Comments on the Criteria to Assess VM-20 YRT Reinsurance Solutions

Mr. Bayerle discussed the ACLI comment letter (Attachment Six-A) on the Criteria to Assess VM-20 YRT Solutions (Attachment Six-B). He said industry is supportive of allowing a prudent level of mortality improvement in the reserve projection. He said the ACLI believes that a principle-based yearly renewable term (YRT) solution should not be constrained by the current requirements of the Accounting Practices and Procedures Manual (AP&P Manual). He opined that changes to the AP&P Manual to address the YRT solution may be appropriate depending on the solution chosen.

Mr. Robinson said his comment letter (Attachment Six-C) provides feedback on the considerations listed in the solutions document. He suggested that a few of the criteria included in the considerations could be eliminated.

Having no further business, the Life Actuarial (A) Task Force adjourned.
Brian Bayerle  
Senior Actuary

December 15, 2020

Mr. Mike Boerner  
Chair, NAIC Life Actuarial Task Force (LATF)

Re: Criteria to Assess VM-20 Solutions for Modeling Non-guaranteed YRT Reinsurance

Dear Mr. Boerner:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the exposed document “Criteria to Assess VM-20 Solutions for Modeling Non-guaranteed YRT Reinsurance”.

ACLI recognizes the inherent challenges in addressing the level of the YRT reinsurance credit under a PBR framework. We appreciate the criteria document that the members of LATF have pulled together to assess potential solutions. We believe that some of the inherent complexity in addressing this issue is due to the level of margins, notably mortality margins, in the computation of the direct reserve. The results of the field study demonstrate the difficulty of clarity, consistency in interpretation, and application of any of the proposed solutions. Some companies favor a simpler solution; other companies support a solution that balances principles-based criteria and model complexity, considers the level of margins, and reflects an appropriate level of risk shared between the direct writer and reinsurer.

Among the criteria outlined, industry is intrigued by the sixth criteria on consideration of mortality improvement beyond the valuation date. Industry supports a prudent level of mortality improvement in the reserve projection as a step to right-size the mortality margin. We support the effort of the joint SOA/Academy POG that is exploring a future mortality improvement methodology for use in projected reserves.

Regarding the requirements outside of the Valuation Manual, we believe the point should make clear that changes to the APPM may be appropriate depending on the solution decided by regulators. As worded, it seems to suggest that the solution should fit into the confines of the accounting requirements, rather than appropriate reserve requirements informing the accounting requirements.

We appreciate the consideration of our comments, and look forward to discussing on a future LATF call. Thank you.
Sincerely,

[Signature]

cc: Reggie Mazyck, NAIC
Criteria to Assess VM-20 Solutions for Modeling Non-guaranteed YRT Reinsurance

Below is a list of potential criteria that could be used to assess proposed VM-20 amendments regarding non-guaranteed YRT reinsurance.

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Potential APF selection criteria and other requirements</th>
</tr>
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</table>
| 1. Level of prescription                   | ▪ The APF should be principles-based, as defined in VM Section I, Overview of Reserve Concepts:  
  ▪ Uses one or more methods, or one or more assumptions, determined by the insurer pursuant to requirements of Model #820 and the Valuation Manual  
  ▪ Reflects risks that are associated with the policies being valued capable of materially affecting the reserve  
  Note: The definition above does not preclude the use of appropriate guardrails or the use of a formulaic component.                                                                                                                                                                                                                   |
| 2. Modeling complexity                      | ▪ The APF should be practical to implement  
  ▪ The APF should be audit able  
  ▪ The APF should allow simplified methods  
  ▪ The APF should provide a safe harbor (e.g., use $c_x$, if a company has a de minimis amount of YRT reinsurance or the product type (e.g., term) produces a small modeled reserve credit). This is in the spirit of the definition of PBR as reflecting risks that are “capable of materially impacting the reserve.”                                                                                                                                                          |
| 3. Variation in interpretations leading to variation in results | ▪ The APF should contain an appropriate degree of alignment between the modeled reinsurance premiums paid by the ceding company and the modeled death claims paid by the assuming company.  
  ▪ The APF should allow for variations in results due to treaty differences  
  ▪ The APF should allow for variations in results from established relationships between a reinsurer and the ceding company that can be supported in the PBR Actuarial Report, and there should be appropriate application of ASOP 56 Section 3.1.6 (Assumptions used as Input)  
  ▪ The APF should contain clear and unambiguous language  
  ▪ The wording of the APF should not result in a wide range of company interpretations (i.e., there are clear requirements). It should produce similar reserve credits for two identical companies, i.e., companies with the same products, income, mortality experience, reinsurance treaties, etc.  
  VM-20 Section 8.C.1: The company shall use assumptions and margins that are appropriate for each company pursuant to a reinsurance agreement. In such instance, the ceding and assuming companies are not required to use the same assumptions and margins for the reinsured policies.                                                                                   |
| 4. Potential for asymmetry between assumed and ceded interpretation | ▪ Although mirror reserving is not a VM-20 requirement (VM-20 Section 8.C.1), the APF should provide guidance on modeling non-guaranteed reinsurance features to be considered by both ceding companies and assuming companies that promotes a reasonable relationship between 1) the ceding company’s pre-reinsurance reserves vs. 2) the ceding company’s post reinsurance ceded reserve + the reserve held by the assuming company.                                                                                                           |
5. Defined level of risk sharing

- The APF should contain provisions for appropriate risk sharing between reinsurance counterparties such that the level of assuming company loss acceptance produced is realistic and consistent with the projected scenario and treaty provisions.
- The approach for setting assumptions for non-guaranteed reinsurance elements under the APF should be consistent with the considerations in VM-20 Section 8.C.7. In addition to the economic environment considered in 8.C.7.b, the NGE assumptions should reflect other relevant moderately adverse conditions – including a moderately adverse mortality scenario.
- The APF should reflect that assumptions used in determining the modeled reserve should account for any actions that the counterparty has taken or is likely to take (VM-20 Sections 8.C.8 and 8.C.10)

**VM-20 8.C.7:** 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:
- a. The usual and customary practices associated with such agreements.
- b. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
- c. Any limits placed upon either party’s ability to exercise contractual options in the reinsurance agreement.
- d. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.
- e. Actions that might be taken by a party if the counterparty is in financial difficulty.

**VM-20 8.C.8:** The company shall account for any actions that the ceding company and, if different, the direct-writing company have taken or are likely to take that could affect the expected cash flows of the reinsured business in determining assumptions for the modeled reserve.

**VM-20 8.C.10:** The company shall use assumptions in determining the modeled reserve that account for any actions that the assuming company has taken or is likely to take that could affect the expected cash flows of the reinsured business.

6. Consideration of mortality improvement beyond the valuation date

- Differences between the future mortality improvement assumption in the VM-20 prudent estimate mortality (currently not allowed) and any future mortality improvement assumption embedded in the current scale of YRT premiums should not be the primary driver to an undue reduction in the aggregate reserve for the business, that is the sum of the ceding company’s post-reinsurance reserve and the assuming company’s reserve

7. Requirements outside the Valuation Manual

- The APF must coordinate and align with the Accounting Practices and Procedures Manual (APPM), or if needed, acknowledge that changes would be required
  - The APF should consider SSAP No. 61R
  - The APF should consider APPM Appendix A-791

8. Other considerations not shown above

- The APF should promote a level playing field (e.g. not favor large companies over small companies, not favor companies with YRT reinsurance over companies without YRT reinsurance)
- The APF should not encourage the use of captives
- The APF should not lead to market disruption (e.g. discouraging use of YRT reinsurance; greatly increasing cost to consumers)
- The APF should not discourage innovation
- The APF should handle all existing types of non-guaranteed reinsurance. While the most commonly considered non-guaranteed reinsurance feature

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**Commented [OS1]:** Consider changing 8.C.7.b economic environment in Valuation Manual to encompass more potential moderately adverse environments – such as a moderately adverse mortality environment
is future YRT premium rates, other non-guaranteed features are also to be considered, such as non-guaranteed expense allowances.

| 9. Outstanding Questions | Should negative reserve credits be avoided, i.e. should there be a floor on the reserve credit (such as \( \frac{1}{2} Cx \))? |

The APF should ideally contain language flexible enough to address emerging reinsurance structures that have not yet been seen in the marketplace.
### Criteria to Assess VM-20 Solutions for Modeling Non-guaranteed YRT Reinsurance

Below is a list of potential criteria that could be used to assess proposed VM-20 amendments regarding non-guaranteed YRT reinsurance.

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  - Reflects risks that are associated with the policies being valued capable of materially affecting the reserve  
  Note: The definition above does not preclude the use of appropriate guardrails or the use of a formulaic component.  
  *JR Comment:* If the APF pertains to DR and/or SR, then meeting this criterion is automatic. Consider deleting. |
| 2. Modeling complexity | The APF should be practical to implement  
  *JR Comment:* “Practical” is in the eye of the beholder.  
  The APF should be auditable  
  *JR Comment:* “Auditable”, which pertains to the VM-31 report, depends on actuary’s ability to explain (to regulator’s satisfaction), which an APF can neither confirm nor deny.  
  The APF should allow simplified methods  
  *JR Comment:* VM already has guidance on simplifications, which should be followed where applicable. Consider deleting.  
  The APF should provide a safe harbor (e.g. use ½ cx if a company has a de minimis amount of YRT reinsurance or the product type (e.g. term) produces a small modeled reserve credit). This is in the spirit of the definition of PBR as reflecting risks that are “capable of materially impacting the reserve.”  
  *JR Comment:* Failure to provide a safe harbor should not lead to exclusion. |
| 3. Variation in interpretations leading to variation in results | The APF should contain an appropriate degree of alignment between the modeled reinsurance premiums paid by the ceding company and the modeled death claims paid by the assuming company.  
  *JR Comment:* Add “from the perspectives of the ceding and assuming companies, respectively”.  
  Also, who decides “appropriate degree of alignment”?  
  The APF should allow for variations in results due to treaty differences |
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<tr>
<td>JR Comment: An APF may not be able to ensure this. Principle-based reserves are based on the notion that each company right-sizes its reserves relative to its unique situation. Therefore, each company should be assumed to be unique.</td>
</tr>
</tbody>
</table>

**VM-20 Section 8.C.1:** The company shall use assumptions and margins that are appropriate for each company pursuant to a reinsurance agreement. In such instance, the ceding and assuming companies are not required to use the same assumptions and margins for the reinsured policies.

**JR Comment:** Ceding and assuming companies are independent actors. An APF cannot ensure a reasonable relationship via principle-based calculations alone.

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* JR Comment: If APPM sets YRT reserve at ½ cx, then any APF will require a change to APPM. (My hope is that the APPM change is to refer to VM rather than set out a specific formula, so future changes to VM don’t require APPM changes.) |

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* JR Comment: The use of captives is motivated by one or more outcomes. Consider identifying which specific outcomes are undesirable. |
| - The APF should not lead to market disruption (e.g. discouraging use of YRT reinsurance; greatly increasing cost to consumers) |

* JR Comment: Who is the judge? |
| The APF should not discourage innovation |

* JR Comment: Who is the judge?
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<th>9. Outstanding Questions</th>
<th>o Should negative reserve credits be avoided, i.e. should there be a floor on the reserve credit (such as ½ Cx)?</th>
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- The APF should handle all existing types of non-guaranteed reinsurance. While the most commonly considered non-guaranteed reinsurance feature is future YRT premium rates, other non-guaranteed features are also to be considered, such as non-guaranteed expense allowances.

  *JR Comment:* So far, we have only considered YRT. Let’s nail down YRT and then expand later if needed.

- The APF should ideally contain language flexible enough to address emerging reinsurance structures that have not yet been seen in the marketplace.

  *JR Comment:* If the structure has not been seen in the marketplace, a determination as to whether a particular APF is applicable doesn’t seem possible. Let’s nail down YRT.
The Life Actuarial (A) Task Force met Jan. 21, 2021. The following Task Force members participated: Texas, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Tynesia Dorsey, Vice Chair, represented by Peter Weber (OH); Jim L. Ridling represented by Steve Ostlund (AL); Ricardo Lara represented by Ben Bock and Perry Kupferman (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); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Jonathan T. Pike represented by Tomasz Serbinowski (UT); Scott A. White represented by Craig Chupp (VA); and James A. Dodrill represented by Tim Sigman (WV).

1. **Adopted its 2020 Fall Meeting Minutes**

Mr. Chou made a motion, seconded by Mr. Ostlund, to adopt the Task Force’s Dec. 3, 2020, minutes (Attachment Seven-A). The motion passed unanimously.

2. **Heard an Update on IRC Section 7702**

Paul Graham (American Council of Life Insurers—ACLI) said the U.S. Congress passed the federal Consolidated Appropriations Act of 2020 at the end of December 2020. He said the Act included COVID-19 relief and changes to Section 7702 of the Internal Revenue Code (IRC), replacing the hard-coded 4% rate for the cash value accumulation test and the 6% rate used in the net single premium calculation for the guideline premium test with an indexed rate. He said that based on the revisions to Section 7702, a 2% life insurance nonforfeiture interest rate floor will be in place for 2021 and 2022, allowing a reduction in the maximum nonforfeiture interest rate to 3.75% for guarantee durations greater than 20 years. He said the ACLI will review the relevant wording in VM-02, Minimum Nonforfeiture Mortality and Interest, to fine-tune it as needed. Mr. Boerner said that companies will have 12 months to comply with the 3.75% rate for states that provide the 12-month option as found in the *Standard Nonforfeiture Law for Life Insurance* (#808), Section 5cH(1). He said state insurance regulators should expect a surge in product filings.

3. **Heard a Status Report on the ESG and Exposed the Scenario Statistics and Reports, the Senior Picker Tool, and the Stochastic Exclusion Ratio Test Documents**

Pat Allison (NAIC) discussed the revised economic scenario generator (ESG) implementation timeline (Attachment Seven-B). She said the timing of the Executive Committee (EX) and Plenary anticipated adoption of ESG-related *Valuation Manual* amendments has been moved from the Summer National Meeting to the Fall National Meeting. She said the Life Insurance and Annuities (A) Committee and the Task Force target adoption dates have been adjusted accordingly. She discussed other target dates that have been adjusted to reflect the revised adoption dates. Brian Bayerle (ACLI) said the timeline is still aggressive and does not allow time for a second round of field testing, if necessary. Mr. Boerner said that if an additional field test is needed, the date for adoption of the *Valuation Manual* amendments will likely be pushed to 2022.

Ms. Allison said the initial ESG recommendations exposed for public comment in December will be revised to include an addendum indicating the types of feedback being sought. The exposure period was extended to March 7 without Task Force objection. Ms. Allison said the ESG field test is expected to run from June through August. NAIC staff will work with state insurance regulators to design the ESG field test. A request for field test participants will be distributed in the next few days. Companies will be asked to respond by March 1. Reports developed from field test results will be shared publicly.

Scott O’Neal (NAIC) shared that ESG-related exposures are posted on the Exposure tab of the Task Force web page. He said production scenario files and documentation will be available on the landing page of the Conning website. He said instructions for accessing these items are provided in the “Navigation to ESG Information” document (Attachment Seven-C) on the Related Documents tab of the Task Force web page. Mr. O’Neal and Dan Finn (Conning) discussed the Scenario Statistics and Reports (Attachment Seven-D), the Scenario Picker Tool (Attachment Seven-E), and the Stochastic Exclusion Ratio Test (Attachment Seven-F) documents.

Mr. Boerner exposed the three documents for a 45-day public comment period ending March 7.
Having no further business, the Life Actuarial (A) Task Force adjourned.
Draft Pending Adoption

Draft: 12/14/20

Life Actuarial (A) Task Force
Virtual 2020 Fall National Meeting
December 3, 2020

The Life Actuarial (A) Task Force met via conference call Dec. 3, 2020. The following Task Force members participated: Texas, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Tynesia Dorsey, Vice Chair, represented by Peter Weber (OH); Jim L. Ridling represented by Steve Ostlund (AL); Ricardo Lara represented by Perry Kupferman (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou and Jim Jakielo (CT); Doug Ommen represented by Mike Yanacheak (IA); Robert H. Muriel represented by Bruce Sartain and Vincent Tsang (IL); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Seong-min Eom (NJ); Russell Toal represented by Anna Krylova (NM); Linda A. Lacerwell represented by Bill Carmello (NY); Glen Mulready represented by Andrew Schallhorn (OK); Tanji J. Northrup represented by Tomasz Serbinowski (UT); and Scott A. White represented by Craig Chupp (VA).


The Task Force met Nov. 12, Nov. 5, Oct. 29, Oct. 27, Oct. 22, Oct. 8, Oct. 1, Sept. 24 and Aug. 27. During these meetings, the Task Force took the following action: 1) adopted its Summer Meeting minutes; 2) adopted its 2021 proposed charges; 3) adopted the 2021 Generally Recognized Expense Tables (GRET); 4) adopted revisions to Actuarial Guideline XLIX—The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest (AG 49); 5) adopted changes to the Standard Nonforfeiture Law for Individual Deferred Annuities (#805); 6) adopted amendment proposal 2020-02, which clarifies guidance on the boundaries of a company’s latitude in following VM-20, Requirements for Principle-Based Reserves for Life Products, steps; 7) adopted amendment proposal 2020-03, which clarifies net premium reserve (NPR) calculation requirements; and 8) adopted amendment proposal 2020-09, which modifies the life principle-based reserving (PBR) exemption.

Mr. Andersen made a motion, seconded by Mr. Chou, to adopt the Task Force’s Nov. 12 (Attachment One), Nov. 5 (Attachment Two), Oct. 29 (Attachment Three), Oct.27 (Attachment Four), Oct. 22 (Attachment Five), Oct. 8 (Attachment Six), Oct. 1 (Attachment Seven), Sept. 24 (Attachment Eight) and Aug. 27 (Attachment Nine) minutes. The motion passed unanimously.

2. Adopted the Report of the Longevity Risk (E/A) Subgroup

Mr. Ostlund made a motion, seconded by Mr. Weber, to adopt the report of the Longevity Risk (E/A) Subgroup (Attachment Ten). The motion passed unanimously.

3. Adopted the Report of the Guaranteed Issue (GI) Life Valuation (A) Subgroup

Mr. Ostlund made a motion, seconded by Mr. Weber, to adopt the report of the Guaranteed Issue (GI) Life Valuation (A) Subgroup (Attachment Eleven). The motion passed unanimously.

4. Adopted the Report of the Experience Reporting (A) Subgroup

Mr. Ostlund made a motion, seconded by Mr. Weber, to adopt the report of the Experience Reporting (A) Subgroup (Attachment Twelve). The motion passed unanimously.

5. Adopted the Report of the Indexed Universal Life (IUL) Illustration (A) Subgroup

Mr. Ostlund made a motion, seconded by Mr. Weber, to adopt the report of the Indexed Universal Life (IUL) Illustration (A) Subgroup (Attachment Thirteen). The motion passed unanimously.

6. Adopted the Report of the Variable Annuities Capital and Reserve (E/A) Subgroup

Mr. Ostlund made a motion, seconded by Mr. Weber, to adopt the report of the Variable Annuities Capital and Reserve (E/A) Subgroup (Attachment Fourteen). The motion passed unanimously.
7. **Adopted the Report of the Valuation Manual (VM)-22 (A) Subgroup**

Mr. Sartain said that during the Subgroup’s Sept. 29 meeting, Aaron Sarfatti (Equitable), who was heavily involved in the development of VM-21, Requirements for Principle-Based Reserves for Variable Annuities, advocated for the fixed annuity PBR framework using a standard projection amount (SPA) analogous to the SPA in VM-21.

Mr. Sartain said the American Academy of Actuaries’ (Academy) Annuity Reserve Work Group (ARWG) presented a slide deck titled “ARWG Preliminary Framework” during the Subgroup’s Oct. 28 and Oct. 26 meetings. He said the most critical aspect of the presentation was addressing the aggregation issue. The deck was exposed for a 45-day public comment period ending Dec. 14. Mr. Sartain said the ARWG has begun drafting a chapter for the Valuation Manual reflecting the concepts in the deck. He noted that during its Oct. 21 meeting, the Subgroup voted unanimously to recommend to the Task Force that the feasibility of developing an SPA analogous to that in VM-21 be explored. He said the determination of whether the proposed SPA might serve as either a floor or disclosure item will be made later.

Mr. Sartain said that in addition to the four meetings for which the minutes are provided, the Subgroup had an educational session in November. The session was led by Rick Hayes (Willis Towers Watson), a consultant for the ARWG. Mr. Hayes presented preliminary modeling results using the ARWG’s preliminary framework as guidance. The modeling focused on a generic fixed income annuity (FIA) product with guaranteed withdrawal benefits (GWBs). The modeling results showed numerical examples of reserves calculated under the ARWG preliminary framework. The modeling results are intended to assist those parties who are interested in commenting on the framework.

Mr. Sartain made a motion, seconded by Mr. Leung, to adopt the report of the VM-22 (A) Subgroup, including its Oct. 28 (Attachment Fifteen), Oct. 26 (Attachment Sixteen), Oct. 21 (Attachment Seventeen) and Sept. 29 (Attachment Eighteen) minutes. The motion passed unanimously.

8. **Heard an Update from the Compact on its Activities**

Katie Campbell (Interstate Insurance Product Regulatory Commission—Compact) provided an update on the activities of the Compact. She said the Compact Management Committee plans to meet Dec. 4 to consider a proposed emergency rule, drafted at the request of Compact officers, to stay the effectiveness of Model #805, the revisions to which are expected to be adopted by the Executive (EX) Committee and Plenary next week. She said that without the stay of effectiveness, the uniform standard would require compliance with the revisions to Model #805 once NAIC adoption has been completed, regardless of whether the revisions have been passed by individual Compact states. She said the delay will be in effect for 120 days. During that period, the Product Standards Committee (PSC) will determine whether or how to implement the revised standard.

Ms. Campbell said a subgroup of the Actuarial Working Group is working on a standard for interim values for index-linked variable annuities (ILVAs), also known as registered indexed-linked annuities (RILAs), with a goal of having it available early in 2021. She said additional standards for waiver of monthly deductions, waiver of insurance premium and waiver of surrender charges are being referred to the Management Committee.

Ms. Campbell said the Compact has received 1,135 filings through Oct. 31, of which 1,074 have been approved. Those numbers are down 20% compared to last year. She said the average wait time for review of a filing is 20 days, compared to 33 days last year. The median number of states on a Compact filing is 43. The number of mix-and-match filings has continued to decrease and now comprises 21% of filings. She said 54% of the filings are for life products, 33% of the filings are for annuity products, and most of the remaining filings are for long-term care (LTC) and disability income. She said a filing information notice 2020-01, related to companies filing changes to the life insurance nonforfeiture interest rate, has been published.

Mr. Carmello asked if the Task Force should look at the interim value requirements for ILVAs. Mr. Weber, who chairs the Compact Interim Values Subgroup, said there is no existing regulatory framework for the product. He said the Subgroup is working to develop standards. He said he anticipates bringing those standards to the Task Force for its consideration. Mr. Carmello suggested that, in the future, the Task Force should take the lead on developing standards for new products.

9. **Heard an Update on SOA Research and Education**

Dale Hall (Society of Actuaries—SOA) gave a presentation (Attachment Nineteen) on U.S. data on mortality by socioeconomic group and updating the Task Force on SOA research efforts. He said the mortality study period covers years 1999 through 2018 and shows the growing disparities across socioeconomic groups. He said the disparities are also evident in mortality improvement data.
Mr. Hall discussed other SOA research efforts, highlighting the recently completed SOA research study assessing the impact of COVID-19 on group life mortality. He said information on the impact of COVID-19 on individual life mortality will be available in spring 2021.

10. Heard an Update from the Academy LPC on its Recent Activities and 2021 Priorities

Laura Hanson (Academy Life Practice Council—LPC) gave a presentation (Attachment Twenty) on the LPC’s recent activities and its 2021 priorities. She said that in addition to the items listed as recent activities, the LPC is finalizing a letter to the Life Insurance and Annuities (A) Committee to raise awareness of the implications on underwriting and risk classification of some recent regulatory and legislative actions taken by a few states.

Ms. Hanson said the results of the asset adequacy testing survey and analysis will be presented early next year. She discussed the webinars and boot camps planned for 2021. She listed a few of the Academy efforts supporting its promotion of diversity and inclusion within the actuarial profession and in the broader insurance industry, including the NAIC initiatives related to race and insurance issues. She noted that the Academy is developing a policy statement on race and insurance issues.

11. Heard a Report on the Applicability of HIPAA Privacy and Security to the NAIC as Experience Reporting Agent

Dan Schelp (NAIC) addressed issues raised with respect to amendment proposal 2019-56 and the use of accelerated underwriting. He said the issue was raised as to whether the information collected in accordance with VM-50, Experience Reporting Requirements (VM-50), and VM-51, Experience Reporting Formats (VM-51), would be covered under the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA). He said that after legal review by an outside counsel, it is not believed that the NAIC is subject to HIPAA confidentiality requirements in its role as experience reporting agent. He said the NAIC will continue to take the most conservative approach by developing a confidentiality framework that will provide protections, similar to those required by HIPAA, for the sensitive information it is collecting.

Mr. Schelp provided a brief discussion of the NAIC Legal Division’s review of this issue and the plan of action the NAIC will take as the Experience Reporting Agent to protect the confidentiality of this information going forward. He said VM-50 designates the NAIC as experience reporting agent. The requirements in VM-50 include guidance for the experience reporting process, the roles of the relevant parties, the intended use of and access to the experience data, and the process to protect the confidentiality of the data as outlined in the Standard Valuation Law (#820). He said VM-50 resulted from a long and detailed series of negotiations between the regulators and the insurance industry, with the highest consideration being given to the protection of confidential experience data. He said that, with that level of confidentiality at the forefront, VM-51 was drafted to guide the implementation of statistical plans used in the collection of the experience data. Under its current statistical plan, VM-51 contains 46 data elements to be collected from individual companies on an annual basis. These data elements contain confidential and individually identifiable information. The initial collection of this data was to begin in 2020 but was delayed for one year due to the COVID-19 pandemic.

Mr. Schelp explained that some insurers are currently using accelerated underwriting techniques as a substitute for requiring a physical examination by supplementing the application process with information obtained using new analytics and modeling techniques. Amendment proposal 2019-56 was submitted in response to the need to: 1) collect data that allows comparison of accelerated underwriting findings to existing underwriting techniques; 2) identify the variables that affect and differentiate mortality; and 3) allow for the development of industry mortality experience tables, which are more reflective of actual experience. He said that during the public exposure of amendment proposal 2019-56, industry expressed a new series of concerns as to whether the expanded collection of data caused increased confidentiality concerns under HIPAA. Mr. Schelp said that while amendment proposal 2019-56 would greatly increase the number of individual data elements to be collected, it would not change the nature of these data elements or increase the NAIC’s risks under HIPAA. He said the NAIC retained the Haynes Benefits law firm, a nationally known HIPAA consulting firm, to provide an overview of any HIPAA issues and guidance on how to best address these issues. He said that Haynes Benefits has worked with the NAIC on its own HIPAA-related issues for several years and has intimate knowledge of the NAIC data systems.

Mr. Schelp shared the specific guidance on the applicability of HIPAA to VM-51 provided by Haynes Benefit:

A. To be subject to HIPAA, the NAIC must either be a Covered Entity or a Business Associate. The types of data reported under VM-50 and VM-51 most likely will not be subject to HIPAA because the NAIC as the Experience Reporting Agent will not be either a Covered Entity or Business Associate.
There are 3 types of Covered Entities under HIPAA:

(1) Health Plans;

(2) Healthcare Clearinghouses; and

(3) Healthcare providers that conduct certain types of transactions in electronic format.

C. The NAIC in its role as the Experience Reporting Agent is clearly not a Health Plan, which is defined as a plan that pays for the costs of health care.

D. The NAIC in its role as the Experience Reporting Agent is clearly not a Healthcare Provider, which is defined as a provider of medical or other services, or any entity that furnishes, bills, or is then paid for healthcare in the normal course of business. This definition includes, for example, physicians, pharmacies, nursing homes, etc. Clearly the NAIC in its role as Experience Reporting Agent is not a Healthcare Provider.

E. The NAIC in its role as the Experience Reporting Agent is clearly not a Healthcare Clearinghouse, which is defined as an entity that facilitates the processing of health information received from another entity. When HIPAA was enacted, Clearinghouses served the useful function of taking non-standard provider billings and converting them into claims to be presented to health carriers. The NAIC as the experience Reporting Agent will be collecting this information solely for underwriting and rating purposes, not for community health related concerns.

F. The NAIC in its role as the Experience Reporting Agent is not a Business Associate, which is defined as an entity that performs a function or activity on behalf of a Covered Entity and uses or discloses Protected Health Information in connection with that function. Actuarial and Data Aggregation are considered to be services that can make an entity a Business Associate. Haynes Benefits is of the opinion that the NAIC in its role as Experience Reporting Agent most likely will not be deemed a Business Associate.

Mr. Schelp said that while the NAIC is not a covered entity or business associate subject to HIPAA, on the remote chance that the NAIC may be found to be either a covered entity or a business associate, it has taken and will continue to maintain measures to make sure that the experience data will be secure and in compliance with both HIPAA and VM-50, including the provision of a Statement on Standards for Attestation Engagements (SSAE) 18 Service Organization Control (SOC) 2 audit report. He said the NAIC will work with Haynes Benefits to conduct a HIPAA risk analysis and prepare corresponding policies and procedures under VM-50. He noted that the NAIC has already entered into several agreements to assure the confidentiality of the experience data being requested, including entering into an Experience Reporting Agent Agreement with the Missouri Department of Commerce and Insurance (DCI), as well as implementing a click agreement for companies submitting data that incorporates the confidentiality provisions of VM-50.

12. **Adopted Amendment Proposal 2020-08**

Tim Cardinal (Cardinalis 1 Consulting) said the *Valuation Manual* allows either a top-down or bottom-up method of aggregating company mortality experience. He said these methods are limiting for a company with highly granular mortality assumptions, resulting in numerous segments with lower credibility. He said amendment proposal 2020-08 recommends a hybrid approach that uses the bottom-up approach to aggregate to an acceptable level of credibility, followed by application of the top-down approach to subdivide those segments. Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI comment letter (Attachment Twenty-One) questions whether the bottom-up approach, the top-down approach and the approach being recommended comprise the universe of possible aggregation approaches and requests that, sometime in the future, the Task Force consider replacing the language defining the requirements of the aggregation approaches with language that is less prescriptive and more principle-based language. Ms. Hemphill said aggregation is an area where company compliance is an issue. She expressed concern that the proposed method may cause more compliance issues but agrees that the proposed method should be allowed and supports Task Force adoption of the amendment proposal. In response to the ACLI comment, she said she does not consider the three methods prescriptive and said they should comprise the universe of approaches. Leonard Mangini (Academy) said the proposed approach fixes issues with the existing approaches and offers flexibility that captures the universe of approaches.

Mr. Weber made a motion, seconded by Mr. Leung, to adopt amendment proposal 2020-08 (Attachment Twenty-Two). The motion passed unanimously.
13. Exposed Amendment Proposal 2019-33

Mary Bahna-Nolan (Academy) said amendment proposal 2019-33 addresses policies that have rate structures and underwriting similar to individual policies but are filed under group life insurance contracts. She said the proposal recommends that the policies receive the same reserve treatment as individual policies. She noted that an earlier version of the amendment proposal included edits to VM-51. She said the references to VM-51 have been removed and will be considered in a different amendment proposal that specifically addresses experience reporting data elements. The change proposed by amendment proposal 2019-33 will be applicable to policies issued on or after Jan. 1, 2024 and is optional for such policies issued on or after the VM operative date but prior to Jan. 1, 2024. Mr. Sartain asked if the proposal’s long-term guarantee requirement should be a stand-alone criterion. Mr. Boerner suggested that Mr. Sartain submit his question during the public comment period. Mr. Carmello suggested that the criteria listed in the amendment proposal are not specific enough. He said that the requirements should be more prescriptive with perhaps fewer criteria.

Mr. Robinson made a motion, seconded by Mr. Leung, to expose amendment proposal 2019-33 (Attachment Twenty-Three) for a 60-day public comment period ending Feb. 4. The motion passed unanimously.

14. Exposed Amendment Proposal 2020-11

Ms. Hemphill said amendment proposal 2020-09 (see the Nov. 5 Task Force minutes), which the Task Force adopted previously, will be effective for the 2022 Valuation Manual. She said states could consider allowing a permitted practice for 2020 and 2021 if companies wish to use the exemption provided in the amendment. She said amendment proposal 2020-11 adds language that supports amendment proposal 2020-09 such that after 2021, an annual granting of a permitted practice for policies issued in 2020 and 2021 is not required.

Mr. Boerner said the exposure of amendment proposal 2020-11 will include the language of amendment proposal 2020-09.

Mr. Robinson said the language of 2020-09 should not reference Appendix VM-A and Appendix VM-C. Mr. Boerner suggested making a comment to that effect during the public comment period.

Mr. Leung made a motion, seconded by Mr. Chupp, to expose amendment proposal 2020-11 (Attachment Twenty-Four) for a 60-day public comment period ending Feb. 4. The motion passed unanimously.

15. Discussed Experience Reporting Time Lag

Ms. Bahna-Nolan said that the reprieve from experience data reporting requirements in 2020 has resulted in a slowing of the SOA industry mortality development process. She asked the Task Force to consider reducing the two-year time lag for experience reporting to a one-year time lag to help alleviate the slowdown. Mr. Boerner said the Task Force will work to expose the possibility of using a one-year time lag for public comment and discuss comments during a future meeting.

16. Discussed the ESG Implementation Timeline and Overview of Treasury Model

Pat Allison (NAIC) reviewed the implementation timeline for the economic scenario generator (ESG) (Attachment Twenty-Five). She noted that the first three milestones have been completed and reminded the audience that the presentation given to the Task Force and the Life Risk-Based Capital (E) Working Group on Oct. 27 is posted on the groups’ web pages. She said there is ongoing development work on both the NAIC’s and Conning’s website to allow access to prescribed scenarios, documentation, training materials and tools. State insurance regulators can obtain access to Conning’s full documentation related to the basic dataset by requesting it directly from Conning. Interested parties will be able to obtain access to the documentation but must first sign a nondisclosure agreement.

Ms. Allison noted that there will be a single field test, unless the field test results indicate that a second field test is warranted. She said the NAIC has models remaining from the Oliver Wyman work on the yearly renewable term (YRT) field test that can be used in the ESG field test. She said the field test is still being designed but is expected to include comparisons of reserves and capital produced by the Conning GEMS Treasury Model against those produced by the Academy interest rate generator.

Ms. Allison said milestone 21, the July 2021 Life Insurance and Annuities (A) Committee adoption of the ESG-related Valuation Manual amendments, is a critical milestone that cannot be moved and cannot be missed if the project is to meet its January 2022 implementation target date. Mr. Boerner said the timeline will be adjusted as needed.
Daniel Finn (Conning) shared a slide presentation (Attachment Twenty-Six) on the GEMS model. Mr. Finn noted that while the Academy interest rate generator (AIRG) uses one-year and 20-year maturities to fit the yield curve, the GEMS model uses the three-month maturity and two other maturity points selected as part of an optimization routine that minimizes the gap between the actual and fitted curves. Mr. Finn discussed the following set of goals and the related Task Force decisions:

1. **Goals relating to the yield curve shape:**
   
   a. The model’s starting yield curve should match the actual yield curve as closely as possible.
   
   b. The model should produce a variety of yield curve shapes, and they should change over time.
   
   c. Interest rates can be negative.

   **Task Force Decisions:**
   
   How fast should the actual vs. fitted curve discrepancies disappear?
   
   Should the model produce negative interest rates?
   
   • If so, how low should rates be allowed to go, and how frequently should negative rates occur?
   
   • If not, how absolute is this? Should there be a floor?

2. **Goals relating to interest rate mean reversion:**

   a. The model should be capable of producing a reasonable range of results for very long simulations.

   b. The ESG should be capable of producing low interest rates for an extended period of time.

   **Task Force Decisions:**
   
   • What is the mean reversion target, and what methodology will be used to determine it?
   
   • What mean reversion speed is desired?
   
   • How many low for long scenarios are desired?
   
   • What sensitivities should be tested prior to field testing, and how should they be determined?

3. **Goals relating to interest rate volatility:**

   a. The model should produce interest rate levels that fluctuate significantly over long periods.

   **Task Force Decision:** No decision needed.

4. **Other goals:**

   a. The interest rate generator should be arbitrage-free.

   b. The ESG should be calibrated using an appropriate historical period.

   **Task Force Decision:**
   
   • The GEMS model is arbitrage-free. However, if a floor is introduced, it will no longer be arbitrage-free.

The audio of the timeline discussion and the overview of the GEMS Treasury Model will be posted on the Related Documents tab of the Task Force page.

Having no further business, the Life Actuarial (A) Task Force adjourned.
**ESG Implementation Timeline**

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<td>10/27 LATF/LRBC WG meeting on background &amp; deliverables</td>
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<td>Website development: Conning creates page to house prescribed scenarios, documentation, training materials, and tools, with access provided via link on NAIC website. Websites go live by 12/31/20.</td>
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<td>Documentation: Conning edits current documentation to include only information relevant to the Basic Data Set. Access to be provided by 12/31/20.</td>
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<td>Education sessions: Conning presents ESG overview, calibration, parameters, and tools at LATF/Life RBC WG meetings</td>
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<td>ESG modifications: Potential changes to calibration, parameters, and tools are discussed and exposed for comment at LATF/Life RBC WG meetings</td>
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<td>Parameter updates: Proposed frequency of updates is discussed and exposed for comment at LATF/Life RBC WG meeting</td>
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<td>Conning's scenario reduction tool (to allow companies to choose a specific number of representative scenarios from a universe of 10,000) is discussed and exposed for comment at LATF/Life RBC WG meeting.</td>
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<td>Conning's calibration criteria (to determine whether stratified scenario subsets are sufficiently dispersed relative to the universe of 10,000 scenarios) are discussed and exposed for comment at LATF/Life RBC WG meeting.</td>
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<td>Conning's tool to generate scenarios for the VM-30 Stochastic Exclusion Ratio Test is discussed and exposed for comment at LATF/Life RBC WG meeting.</td>
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<td>Conning's tool to generate the VM-21 Company Specific Market Path scenarios is discussed and exposed for comment at LATF/Life RBC WG meeting.</td>
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<td>Conning's tool to generate statistics, to be determined, on the scenario output, and validation reports (summarizing key characteristics of the Basic Data Set) are exposed for comment at LATF/Life RBC WG meeting.</td>
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<td>14</td>
<td>LATF/LRBC WG meetings to discuss comment letters received on exposures, and approve desired ESG and tool modifications for field testing</td>
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<td>15</td>
<td>Conning makes ESG and tool modifications for field testing</td>
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<td>16</td>
<td>Preparation for reserve and capital field tests</td>
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<td>17</td>
<td>Conduct VM-20 and VM-21 industry field tests to determine life and VA reserve impacts and compile results</td>
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<td>Field Testing</td>
<td>Compile Results</td>
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<tr>
<td>18</td>
<td>Conduct C3 Phase 1 and C3 Phase 2 industry field tests and compile results</td>
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<td>24</td>
<td>LATF/URBC WG meetings to discuss 1) aggregate field test results, 2) whether any calibration or parameter changes are needed based on the results (this timeline assumes none), and 3) potential VM and RBC instruction impacts, e.g. phase-in language</td>
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<td>25</td>
<td>LATF exposes and adopts any necessary VM-20, VM-21, and VRM-31 amendments</td>
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<tr>
<td>26</td>
<td>NAIC A Committee adopts Valuation Manual amendments</td>
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<tr>
<td>27</td>
<td>Conduct field test for fixed deferred and immediate annuities (assumed not to be required to implement new ESG for the 2022 VM since VM-22 framework is targeted for 2023)</td>
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<td>28</td>
<td>Conning updates documentation to reflect modifications adopted by regulators, and finalizes training materials</td>
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<td>29</td>
<td>Life RBC WG begins discussion on C3 Phase 1 and C3 Phase 2 instruction changes by 3/31/22 and exposes them for comment by 4/30/22</td>
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<td>30</td>
<td>Life RBC WG adopts C3 Phase 1 and C3 Phase 2 instruction changes by 5/31/22</td>
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<td>31</td>
<td>NAIC E Committee adopts RBC changes by 8/31/22</td>
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<td>32</td>
<td>NAIC Exec/Plenary adopts Valuation Manual amendments</td>
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<tr>
<td>33</td>
<td>NAIC Exec/Plenary adopts RBC instruction changes by Dec. 2022</td>
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<td>34</td>
<td>Conning sets up process to run the Basic Data Set as of each month-end and produce scenarios and related tools</td>
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<td>35</td>
<td>NAIC and Conning prepare websites for links to final documentation, training materials, scenarios and tools</td>
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<td>36</td>
<td>New ESG prescribed for VM-21 and VM-22 effective 1/1/22, and for C3 Phase 1 and C3 Phase 2 effective 12/31/22.</td>
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Note: The intent would be to compare Conning’s ESG against the AAA ESG throughout milestones 6-13.
Navigation to ESG Information

Link:  https://content.naic.org/cmte_a_latf.htm

Navigation path:  NAIC Home Page → Committees → Expand (+) button to the right of Life Insurance and Annuities (A) Committee → Life Actuarial (A) Task Force

ESG Exposure documents can be found on the tab labeled “Exposure Drafts”

Some of the reference materials related to the implementation effort for the ESG can be found in the tab labeled “Related Documents”

Principle-Based Reserving (PBR) Section on the NAIC’s Website

Link:  https://content.naic.org/pbr_data.htm

Navigation path:  NAIC Home Page → Industry → click in the box for Principle-Based Reserving (PBR) → scroll down to the Economic Scenarios section

ECONOMIC SCENARIOS

Clicking on the link labeled “Economic Scenarios, Tools, Training Materials, and Documentation” will take you to the ESG landing page on Conning’s website. Related files, including files for the ESG Exposures, can be found on the landing page.
ESG Exposure 1/21/21: Scenario Statistics and Reports

A set of scenario statistics and reports (ESG Timeline Item #13) are being exposed for a public comment period. Please send comments to Reggie Mazyck (RMazyck@naic.org) by close of business March 7th, 2021.

**Background and Monthly Process:**

To help companies understand the range of results, Conning will produce statistics and reports based on the scenario output. These will be delivered with the scenario output by 4:00 PM Central Time on the first business day of the following month.

**Simulation Summary**

For the base model, there will be one Simulation Summary report for each column of the Basic dataset. The Simulation Summary will include:

- a “fan chart” illustrating percentiles of the return distribution over time,
- a table of statistics at different periods in the projection, and
- a graph of the cross-sectional volatility throughout the projection.

The Simulation Summary reports for the 10,000 scenarios as of 12/31/19 exposed on December 18th, 2020 can be accessed via a link from the PBR section on the NAIC’s website to the ESG landing page on Conning’s website, or by clicking the following link directly below.

**Simulation Summary as of 12/31/19**

Note: The Simulation Summary currently contains separate reports for income and price and displays monthly returns. It may be preferable to:

- summarize just total returns, and/or
- summarize returns year over year, instead of monthly.

We are seeking feedback on this.
Average Yield Summary

To help envision the progression of yield curves, Conning will also produce a summary of average yields over time. (Note: To avoid over burdening the chart, the report will only include selected future time periods.)
**Additional Items**

Conning will also provide charts to help analyze other key items. For example, this may include information on yield curve inversion frequency, correlation (e.g. between different points on the yield curve, between equity and treasury returns, etc.), excess returns (e.g. excess returns over cash, equity returns over long treasury returns, long corporates over long treasuries etc.). The list of items can be extended as needed.

**Subset Reports**

Conning will produce reports which compare the scenario subset results to those from the entire distribution of 10,000 scenarios. For the Yields, the percentile results from the 10,000 scenarios would be compared to the percentiles taken from each subset and would be presented in a similar fashion to the graph below where the full set of GEMS scenarios is compared to AIRG scenarios. The actual subset reports will be available shortly via a link from the PBR section on the NAIC’s website to the ESG landing page on Conning’s website.
**Request for Comments**

Please send your comments to Reggie Mazyck (RMazyck@naic.org) by close of business March 7th, 2021. Comments are appreciated on any aspect of the reports, including:

- the format and useability of the reports,
- the desired statistics to be included,
- whether reports for total returns are more desirable than separate reports for income and price, and
- whether returns should be summarized on a monthly or annual basis.
ESG Exposure 1/21/21: Scenario Picker Tool

A Scenario Picker Tool (ESG Timeline Item #9) is being exposed for a public comment period. Please send comments to Reggie Mazyck (RMazyck@naic.org) by close of business March 7th, 2021.

Background
One of the components of the Academy Interest Rate Generator which needs to be replaced is the Scenario Picker Tool. This tool creates subsets (i.e., 50, 200, 500, and 1000 scenarios) from the full set of 10,000 scenarios, which can be used to reflect the full distribution.

Currently, if a scenario subset is used in reserve calculations, VM-20 prescribes use of the scenario picker tool but VM-21 does not. Applicable VM language is shown below.

VM-20 Section 7.G.2.c:

Use of fewer scenarios rather than a higher number of scenarios is permissible as a model efficiency technique provided that:

i. The smaller set of scenarios is generated using the scenario picker tool provided within the prescribed scenario generator, and

ii. The use of the technique is consistent with Section 2.G.

VM-21 Section 8.F:

1. For straight Monte Carlo simulation (with equally probable “paths” of fund returns), the number of scenarios should typically equal or exceed 1000. The appropriate number will depend on how the scenarios will be used and the materiality of the results. The company should use a number of scenarios that will provide an acceptable level of precision.

2. Fewer than 1,000 scenarios may be used provided that the company has determined through prior testing (perhaps on a subset of the portfolio) that the CTE values so obtained materially reproduce the results from running a larger scenario set.

3. Variance reduction and other sampling techniques are intended to improve the accuracy of an estimate more efficiently than simply increasing the number of simulations. Such methods can be used provided the company can demonstrate that they do not lead to a material underestimation of results. Many of the techniques are specifically designed for estimating means, not tail measures, and could in fact reduce accuracy (and efficiency) relative to straight Monte Carlo simulation.


4. The above requirements and warnings are not meant to preclude or discourage the use of valid and appropriate sampling methods, such as Quasi Random Monte Carlo (QRMC), importance sampling or other techniques designed to improve the efficiency of the simulations (relative to pseudo-random Monte Carlo methods).
Scenario Picker Tool Methodology

The proposed scenario picker tool follows the current Academy methodology ([https://www.actuary.org/sites/default/files/files/esg/2009_ESWG_tool.zip](https://www.actuary.org/sites/default/files/files/esg/2009_ESWG_tool.zip)) to create scenario subsets. Scenario subsets as of a given valuation date will contain the same scenarios for all users.

Monthly Process

Conning will run the Basic Data Set as of each month-end and produce the full set of 10,000 scenarios, along with four subsets containing 50, 200, 500, and 1,000 scenarios. This process will be completed in time to post the output by 4:00 PM Central Time on the first business day of the following month.

Note: Validation reports for the Basic Data Set and additional statistics will be delivered simultaneously with the scenario files. Users will be provided access to these items via a link from the PBR section on the NAIC’s website to the ESG landing page on Conning’s website.

Note: Rather than providing a scenario picker tool for users to run, Conning will deliver four scenario subsets (50, 200, 500, and 1,000) monthly. Users will not be able to pick a custom number of scenarios.

12/31/2019 Scenario Subsets
Scenario subsets produced as of 12/31/2019 will be provided shortly via a link from the PBR section on the NAIC’s website to the ESG landing page on Conning’s website. These will be selected from the full set of 10,000 scenarios included with the December 18th, 2020 exposure.

Request for Comments
Please send your comments to Reggie Mazyck ([RMazyck@naic.org](mailto:RMazyck@naic.org)) by close of business March 7th, 2021. Comments are appreciated on any aspect of the scenario picker tool, such as:

1. The methodology used in the proposed scenario picker tool,
2. The number and sizes of the subsets to be produced, and
3. The format and usability of the output.
ESG Exposure 1/21/21: VM-20 Stochastic Exclusion Ratio Test (SERT) Scenarios

A methodology to produce the SERT scenarios (ESG Timeline Item #11) is being exposed for a public comment period. Please send comments to Reggie Mazyck (RMazyck@naic.org) by close of business March 7th, 2021.

**Background**
A tool must be developed to produce the prescribed set of 16 scenarios to be used for the VM-20 Stochastic Exclusion Ratio Test (SERT).

**Methodology**
The methodology used to produce the SERT scenarios is intended to follow the current AAA methodology (add link) except where the AAA methodology appears to differ from the scenario descriptions provided in VM-20 Appendix 1.E. For scenarios 13 through 16, the equity scenarios are described as “maintain the cumulative equity return at the 90% (or 10%) level”. The new SERT methodology follows this description. However, the equity returns for scenarios 13-16 produced in the AAA ESG have a delayed pop-up or pop-down.

The recommendation is to convert the Academy’s methodology into target percentiles for the three key variables: 1-Year and 20-Year Treasury Yields and Large Cap Total Return. Note that for scenario 10, the target percentiles are applied to the spread between the short and long rates. See the “Percentile Selection.xlsx” document below to find graphs and formulae describing how the Academy’s SERT methodology will be converted.

Going forward, Conning will take these percentiles and apply them to each projection’s 10,000 scenarios in order to produce 16 paths for these variables. For the additional Treasury Yields, Conning will apply the existing interpolation methodology. For the additional native GEMS equity models (i.e. Mid Cap, Small Cap and Aggressive US Equity), Conning will apply the percentiles from the Large Cap selection. These values will be entered into GEMS using the native User Path technology. This will allow GEMS to calculate all of the other items in both the Basic and Robust datasets conditional on these values. For example, the returns on the **Long Inv Corp Bonds** will include the following:

- Changes in Treasury Yields
- Expected changes in Corporate Spreads due to Treasury and Large Cap movements
- Expected transitions, defaults and recoveries due to current spread levels
SERT Scenarios produced as of 12/31/2019 will be provided shortly via a link from the PBR section on the NAIC’s website to the ESG landing page on Conning’s website. These SERT scenarios will be produced to align with the calibration used in the December 18th, 2020 exposure of 10,000 scenarios.

**Request for Comments**
Please send your comments to Reggie Mazyck (RMazyck@naic.org) by close of business March 7th, 2021. Comments that provide feedback on the methodology used, the output produced, the process to access the output, the format of the output files, or any other aspect of the exposure are welcome.
The Life Actuarial (A) Task Force met Dec. 17, 2020. The following Task Force members participated: Texas, Chair, represented by Mike Boerner and Rachel Hemphill (TX); Tynesia Dorsey, Vice Chair, represented by Peter Weber (OH); Ricardo Lara represented by Ben Bock and Perry Kupferman (CA); Michael Conway represented by Eric Unger (CO); Andrew N. Mais represented by Wanchin Chou (CT); Doug Ommen represented by Mike Yanacheak (IA); Shannon Whalen represented by Vincent Tsang (IL); Stephen W. Robertson represented by Karl Knable (IN); Vicki Schmidt represented by Nicole Boyd (KS); Grace Arnold represented by Fred Andersen and John Robinson (MN); Chlora Lindley-Myers represented by William Leung (MO); Bruce R. Ramge represented by Rhonda Ahrens (NE); Marlene Caride represented by Kevin Clarkson (NJ); Linda A. Lacewell represented by Bill Carmello and Amanda Fenwick (NY); Glen Mulready represented by Andrew Schallhorn (OK); Tanji J. Northrup represented by Tomasz Serbinowski (UT); and Scott A. White represented by Craig Chupp (VA).

1. Exposed the Goals Spreadsheet and Treasury Targets and Parameters Spreadsheet

Daniel Finn (Conning Inc.) provided a GEMS equity and corporate models overview presentation (Attachment Eight-A), which outlines the potential goals related to the models and gives background information and rationale for each goal. Pat Allison (NAIC) discussed a spreadsheet that lists the goals for U.S. Treasury rates, equity and corporate bond returns, and the market proxies used to produce fund returns. The spreadsheet includes the related decisions the Task Force is asked to make for each goal and the initial Conning recommendations for each decision. Connie Tang (Prudential) asked if information supporting the initial Conning recommendations will be made available to interested parties. Ms. Allison said access to the Conning basic data set as of Dec. 31, 2019, calibrated based on the initial set of recommendations, will be made available on the Principle-Based Reserving (PBR) page on the Industry tab of the NAIC website (https://content.naic.org/pbr_data.htm). Mr. Finn said the information will be updated over time to reflect interested party comments and Task Force decisions.

Mr. Boerner asked if any Task Force members objected to exposing the spreadsheet summarizing the decisions needed for the Treasury, equity and corporate models (Attachment Eight-B) and the spreadsheet showing the parameters of the Treasury Model (Attachment Eight-C) for a public comment period ending Jan. 31. There was no objection from Task Force members.

Having no further business, the Life Actuarial (A) Task Force adjourned.
Overview of GEMS® Equity and Corporate Models
Dec. 17, 2020

Dan Finn, FCAS, ASA – Managing Director at Conning
Pat Allison, FSA, MAAA – NAIC Managing Life Actuary

Agenda

1. Presentation Approach
2. Reference Materials and Documentation
3. GEMS® Equity and Corporate Models: Potential Goals
4. Exposure for comments
Presentation Approach

1. Potential goals relating to the GEMS® Equity and Corporate Models are outlined.

2. For each goal:
   a. Background information is provided for educational purposes, along with an underlying rationale
   b. Similarities and differences between the Academy ESG and GEMS® will be discussed
   c. Items requiring decisions are highlighted, along with initial recommendations

Reference Materials and Documentation

The following materials are available on the LATF webpage (Related Documents tab):
https://content.naic.org/cmte_a_latf.htm
1. NAIC Technical Documentation - Corporate Bonds.pdf
2. NAIC Technical Documentation - Equity, DRAFT.pdf

ESG Background Information:

Economic Scenario Generators: A Practical Guide
https://www.soa.org/resources/research-reports/2016/2016-economic-scenario-generators/
Goal relating to equity and bond fund scenarios:

1. Returns should be provided for funds representative of those offered in U.S. insurance products

Rationale and Background: Funds must be mapped to proxy funds. Applicable VM-21 language is shown below. There is similar language in VM-20.

VM-21 Section 4.A.2 (second paragraph) - An appropriate proxy fund for each variable subaccount shall be designed in order to develop the investment return paths. The development of the scenarios for the proxy funds is a fundamental step in the modeling and can have a significant impact on results. As such, the company must map each variable account to an appropriately crafted proxy fund normally expressed as a linear combination of recognized market indices, sub-indices or funds.
### Equity Scenarios: AAA ESG compared to GEMS®

<table>
<thead>
<tr>
<th>AAA ESG Returns*</th>
<th>Market Proxy Used to Produce AAA ESG Returns*</th>
<th>Corresponding GEMS® Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversified Large Capitalized U.S. Equity</td>
<td>S&amp;P500 Total Return Index</td>
<td>S&amp;P 500</td>
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<tr>
<td>Diversified International Equity</td>
<td>MSCI-EAFE $USD Total Return Index</td>
<td>MSCI EAFE</td>
</tr>
<tr>
<td>Intermediate Risk Equity</td>
<td>U.S. Small Capitalization Index</td>
<td>Russell 2000</td>
</tr>
<tr>
<td>Aggressive Equity**</td>
<td>25% Emerging Markets, 12.5% NASDAQ, 62.5% Hang Seng</td>
<td>MSCI Emerging Market, NASDAQ</td>
</tr>
</tbody>
</table>

Additional GEMS® Returns: Russell Midcap (Diversified Midcap U.S. Equity)

The AAA ESG Model produces total returns.

GEMS® returns will be split between income and price, which can be combined to get total returns. Dividends are linked to the 10-Year Treasury yield and are negatively correlated with S&P price movements. Dividends do not affect total returns.

*Source: AAA LCAS C3 Phase II RBC for Variable Annuities: Pre-Packaged Scenarios January 2006

**The Academy Equity Model Aggressive Equity proxy is not meant to suggest a representative asset profile for this class but used merely to build an historic index with high volatility and sufficient history.

### Bond Fund Scenarios: AAA ESG compared to GEMS®

<table>
<thead>
<tr>
<th>AAA ESG Returns*</th>
<th>Market Proxy used to produce AAA ESG Returns*</th>
<th>Corresponding GEMS® Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Market</td>
<td>3 Month Treasury returns</td>
<td>Money Market</td>
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<tr>
<td>U.S. Long Term Corporate Bonds</td>
<td>U.S. Long Term Corporate Bonds</td>
<td>U.S. Long Term Investment Grade Corporate Bonds</td>
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<tr>
<td>Diversified Fixed Income</td>
<td>65% ITGVT + 35% LTCORP</td>
<td>GEMS® produces corresponding components</td>
</tr>
<tr>
<td>Diversified Balanced Allocation</td>
<td>60% Diversified Equity + 40% Fixed Income</td>
<td>GEMS® produces corresponding components</td>
</tr>
</tbody>
</table>


*Source: AAA LCAS C3 Phase II RBC for Variable Annuities: Pre-Packaged Scenarios January 2006
Decision to be made: Which returns should be included in the Basic Data Set?

Initial Recommendation: See table below. Fund returns in blue are new. For the other fund returns, there may be differences between the market proxies used for the AAA ESG and GEMS.

<table>
<thead>
<tr>
<th>Fund Returns</th>
<th>Market Proxy Used to Produce Fund Returns</th>
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<tbody>
<tr>
<td>Diversified Large Capitalized U.S. Equity</td>
<td>S&amp;P 500</td>
</tr>
<tr>
<td>Diversified International Equity</td>
<td>MSCI EAFE</td>
</tr>
<tr>
<td>Intermediate Risk Equity</td>
<td>Russell 2000</td>
</tr>
<tr>
<td>Aggressive Equity 1 (Name TBD)</td>
<td>MSCI Emerging Market</td>
</tr>
<tr>
<td>Aggressive Equity 2 (Name TBD)</td>
<td>NASDAQ</td>
</tr>
<tr>
<td>Diversified Midcap U.S. Equity</td>
<td>Russell Midcap</td>
</tr>
<tr>
<td>Money Market</td>
<td>Money Market</td>
</tr>
<tr>
<td>U.S. Short-Term Government Bonds</td>
<td>50/50 Blend of 1 and 5-year US Treasuries</td>
</tr>
<tr>
<td>U.S. Short-Term Investment Grade</td>
<td>50/50 Blend of 1 and 5-year maturities, 50/50 Blend of A and BBB</td>
</tr>
<tr>
<td>U.S. Intermediate Term Government Bonds</td>
<td>50/50 Blend of 5 and 10-year US Treasuries</td>
</tr>
<tr>
<td>U.S. Intermediate-Term Investment Grade</td>
<td>50/50 Blend of 5 and 10-year maturities, 50/50 Blend of A and BBB</td>
</tr>
<tr>
<td>U.S. Long-Term Government Bonds</td>
<td>50/50 Blend of 10 and 30-year US Treasuries</td>
</tr>
<tr>
<td>U.S. Long Term Corporate Bonds</td>
<td>50/50 Blend of 10 and 30-year maturities, 50/50 Blend of A and BBB</td>
</tr>
<tr>
<td>Diversified Fixed Income</td>
<td>65% Intermediate Term Government Bonds + 35% Long Term Corporate Bonds</td>
</tr>
<tr>
<td>Diversified Balanced Allocation</td>
<td>60% Diversified Large Capitalized U.S. Equity + 40% Diversified Fixed Income</td>
</tr>
<tr>
<td>High Yield Corporates</td>
<td>BB Rated Corporates</td>
</tr>
</tbody>
</table>

Note: The proposed set of equity returns allows direct mapping to MSCI Emerging Market, NASDAQ, and the additional Russell Midcap. This would eliminate a blended mix of indices for the Aggressive Equity investment category (VM-20 and VM-21 allow companies to create their own proxy fund blends).

Goal relating to equity and bond fund scenarios:

2. The ESG should be calibrated using an appropriate historical period.

Rationale for this goal: It is important to incorporate a historical period that captures an appropriate range of market dynamics while also being careful not to introduce bias into the generated scenarios.

AAA ESG compared to GEMS®:

- Generally, GEMS Equity model uses historical data back to 1994. The Corporate model uses historical data back to 1991
  - Impacted by large spike in 2008 Financial Crisis

Decision to made: What historical period would regulators like to use?

Initial Recommendation: Use Conning’s current calibration.

*Source: CONSTRUCTION AND USE OF PRE-PACKAGED SCENARIOS TO SUPPORT THE DETERMINATION OF REGULATORY RISK-BASED CAPITAL REQUIREMENTS FOR VARIABLE ANNUITIES AND SIMILAR PRODUCTS, Revised 2006, AAA C-3 Phase II Working Group
Goal relating to the equity scenarios:

3. The equity model should have stochastic volatility and the initial volatility should be updated frequently

Rationale for this Goal: Most equity models have stochastic volatility because this allows for fatter tails in the scenario distribution. Without it, there would be little ability to produce big drops, such as the 2008 financial crisis or Black Monday.

The initial volatility should be updated frequently to reflect recent market movements.

Background: Chicago Board Options Exchange Volatility Index (VIX) reflects the market’s estimate of future volatility. When the VIX is high, there tends to be more volatility in the short term.

AAA ESG compared to GEMS®: Both have stochastic volatility. However, in the AAA ESG, the initial volatility is not updated. So, each time a new set of scenarios is produced, the same starting level of volatility is used.

In GEMS, the initial volatility is updated based on recent market movements (usually during the last month). The process references the VIX and is consistent with how the parameter is simulated.

Decision to be made: Do regulators want to begin using a method to update the initial volatility level?

Initial Recommendation: Utilize GEMS stochastic volatility and process for continued parameter calibration.

Historical Chicago Board Options Exchange Volatility Index (VIX) Level

Goal relating to the equity scenarios:

4. The ESG should have the ability to generate very large losses and gains in short periods of time (i.e. jumps)

Rationale and Background: Historically there have been short periods of large losses (e.g. 1Q 2020, Black Monday) as well as short periods with large gains (e.g. 2Q 2020). This suggests the need for a jump process.

AAA ESG compared to GEMS®:

- AAA ESG does not have a jump process.
- The GEMS jump process is based on historical data and a target for the fatness of the tails (e.g. how likely is a Black Monday). GEMS has more moments and can allow skew and kurtosis, which impact the fatness of the tails.

Decision to be made: How will the targets which impact the calibration of the jump process (e.g. skew and kurtosis) be expressed?

Initial Recommendation: Use Conning’s existing calibration.
Goal relating to the equity scenarios:

5. Equity scenarios need to reflect the possibility of a very long recovery after a period of losses

Rationale and Background: During certain periods of time after periods of recession or depression, there have been extended periods of equity market recovery. This is important to reflect in the scenarios due to the long-term nature of some insurance liabilities.

AAA ESG compared to GEMS®: Both the AAA ESG and GEMS can produce equity scenarios that exhibit low returns over an extended period of time. This is largely driven by volatility and the expected return. If there is enough volatility or if there are low enough expected returns, low for long scenarios will be produced.

As of 9/30/20, GEMS produced 34 scenarios with cumulative negative returns over a 30-year projection compared to 3 scenarios for the AAA ESG.

Decision to be made: None
Goal relating to the equity scenarios:

**6. There should be higher correlation in the tail scenarios between different equity indices**

**Rationale and Background:** Historically, equity markets have been highly correlated in bad times. This is particularly important for reserve and capital CTE calculations.

**Applicable VM-21 language:**

VM-21 8.C.9: It is not necessary to assume that all markets are perfectly positively correlated, but an assumption of independence (zero correlation) between the equity markets would inappropriately exaggerate the benefits of diversification. An examination of the historic data suggests that correlations are not stationary and that they tend to increase during times of high volatility or negative returns. As such, the company should take care not to underestimate the correlations in those scenarios used for the reserve calculations.

**AAA ESG compared to GEMS®:**

- AAA ESG uses a static correlation matrix based on data going back to 1953
- GEMS is capable of producing returns that exhibit higher degrees of correlation in the tail scenarios. GEMS correlations are based on historical data going back mainly to 1994, and back to 1953 for some components.

---

**AAA ESG compared to GEMS® as of 9/30/20:**

*Correlation between S&P 500 and Russell 2000 by Quintile*

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Historical</th>
<th>GEMS</th>
<th>AAA ESG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>75%</td>
<td>90%</td>
<td>85%</td>
</tr>
<tr>
<td>2nd</td>
<td>65%</td>
<td>75%</td>
<td>70%</td>
</tr>
<tr>
<td>3rd</td>
<td>55%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>4th</td>
<td>45%</td>
<td>55%</td>
<td>50%</td>
</tr>
<tr>
<td>5th</td>
<td>35%</td>
<td>45%</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Decision to be made:** Should the Conning calibration be utilized or would regulators like to calibrate to a specific historical period?

**Initial Recommendation:** Use Conning’s existing calibration.

*Historical Correlation measured from 1979 to current*
Goal relating to the equity scenarios:

7. There should be a link between equity returns and Treasury yields

Rationale and Background: It is difficult to see strong relationships between equities and Treasuries because the equity market is so volatile. However, investors typically demand equity returns in excess of those offered by risk-free assets to compensate for bearing risk. Today’s low yields imply lower equity returns.

AAA ESG compared to GEMS®:
- AAA ESG has no link between the equity returns and Treasury yields.
- GEMS links expected equity return to current short Treasury Yield
  - Produces different expected returns across start dates
  - Also makes them impacted by Treasury model’s mean reversion
  - This is a functional relationship, not a correlation

Decisions to be made:
1. Do regulators want a link between equity and treasury scenarios?
2. If so, are any changes to the functional relationship between equities and Treasuries desired?

Initial Recommendation: Use Conning’s existing calibration.

Impact of Changing Initial Treasury Yield
S&P 500 Total Return, 12 Month Projections with 9/30/20 Start

Goal 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.

Rationale and Background:
- Use of the same model will ensure consistency between the total returns in the Basic and Robust Data Sets.
- The Basic and Robust Data Sets provide different levels of detail in the output.
  - The Basic Data Set includes only the total returns for the bond indices.
  - The Robust Data Set will provide details on the components (i.e., spreads, transitions, and defaults).

*The Basic Data Set will be prescribed. The Robust Data Set is optional and is available at a cost.

AAA ESG compared to GEMS®: The AAA ESG and GEMS Basic Data Set both provide total returns for bond indices.
- The AAA ESG total returns are linked to Treasuries, with a remainder modeled as a residual based on historical data
- GEMS Basic Data Set total returns will reflect modeled spreads, transitions, and defaults. Returns are expected to be between Treasuries and Corporate Yields minus a haircut.
  - “Haircut” typically reflects impact of defaults over a holding period
  - GEMS’ returns will also reflect up- and downgrades
  - Since downgrades tend to be more frequent and have a larger impact, the impact of including them will tend to exceed “haircut”

Decision to be made: Do regulators want any changes to the methodology used to generate credit rating transitions, defaults, and dynamic spreads?

Initial Recommendation: Use Conning’s existing calibration.
As Treasury yields increase, bond fund returns tend to decrease

As corporate spreads over Treasuries increase, bond fund returns tend to decrease
As downgrade probability increases, bond fund returns tend to decrease.

AAA ESG compared to GEMS®: Year 1 Long Corporate Total Return

- Much of the difference between bars 1 and 3 is driven by higher volatility in the GEMS Treasury model.
- Bars 2 and 4 show the difference between the Corporate returns and Treasury returns.
Goal relating to the bond fund scenarios:

9. Separate yield curves should be generated by rating, and they should be linked to each other

Rationale and Background:
• Life insurers purchase a wide range of Corporate bonds.
• There are large differences in spreads between ratings.
• For blended bond funds (e.g., 50/50 blend of A/BBB), the total returns provided will be driven off blends of distinctly rated bonds. Bond returns by rating will not be provided in the Basic Data Set

Decision to be made: None

Historical Corporate Spreads over US Treasuries

Goal relating to the bond fund scenarios:

10. The spread between Treasuries and corporate bonds should be stochastic

Rationale and Background: This allows spreads to gap out like they did during the 2008 Financial Crisis and 1Q 2020. The tail of the Corporate Bond returns is driven by these types of jumps. The magnitude of the jump has been significantly different between ratings.

This makes stochastic spreads very important for life insurer’s capital considerations, especially given the very large allocation to bond investments.

Decision to be made: None
Historical Corporate Spreads over US Treasuries (2008 Financial Crisis)

Projected GEMS Corporate Spreads over US Treasuries (single scenario)
Goal relating to the bond fund scenarios:

11. The ESG should include bond credit rating transitions and they should be dynamic

Rationale and Background: When Corporate spreads gap out, the market is indicating that these bonds have additional risk. The higher the spread, the more downward rating transitions.
- Increasing the volatility of spreads is helpful, but it won’t impact expected returns much in these situations
- Need to have some additional risk of downgrade (e.g., make an A Corporate “act” like a BBB Corporate)

Without this, the extra spread will simply lead to extra returns

Decision to be made: Do regulators want to change any of the assumptions driving spreads, rating transitions, and defaults?

Initial Recommendation: Use Conning’s existing calibration.

As spreads increase, downgrade probability increases

Prepared by Conning. Source: GEMS® Economic Scenario Generator scenarios
Summary of Goals

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.

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.

ESG Exposure

The items listed below are exposed for a public comment period ending on 1/31/21.

1. A spreadsheet summarizing the decisions needed for the Treasury, equity, and corporate models (these were included in the 12/3/20 and 12/17/20 LATF presentations), along with an initial set of recommendations.
2. The entire Basic Data Set as of 12/31/19, calibrated based on the initial set of recommendations. This includes:
   - The full set of 10,000 interest rate scenarios
   - Equity and bond fund returns for the funds shown on slide 9.
   - Fan charts summarizing the interest rate scenarios
3. A spreadsheet showing the parameters of the Treasury model, and how targets (e.g., short and long-term mean reversion level, mean reversion speed) are converted into these parameters.

Notes regarding the materials:
- The initial set of recommendations and resulting scenarios represent a first cut at the types of changes that may be desired for the ESG. Additional modifications are expected based on comments received.
- These scenarios are a starting point for discussions, and are not intended to be used for an industry field test. A formal field test is currently planned in the March - May timeframe.
- Comments are appreciated on any aspect of the ESG.
<table>
<thead>
<tr>
<th>12/17/20 LATF Presentation Goal Number</th>
<th>Goal</th>
<th>Decision Needed</th>
<th>Initial Recommendation for Baseline ESG Calibration</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Returns should be provided for funds representative of those offered in U.S. insurance products</td>
<td>Decision to be made: Which returns should be included in the Basic Data Set?</td>
<td>See Fund Returns Tab</td>
</tr>
<tr>
<td>2</td>
<td>The ESG should be calibrated using an appropriate historical period.</td>
<td>What historical period would regulators like to use?</td>
<td>Use Conning's current calibration.</td>
</tr>
<tr>
<td>3</td>
<td>The equity model should have stochastic volatility and the initial volatility should be updated frequently</td>
<td>Do regulators want to begin using a method to update the initial volatility level?</td>
<td>Utilize GEMS stochastic volatility and process for continued parameter calibration.</td>
</tr>
<tr>
<td>4</td>
<td>The ESG should have the ability to generate very large losses and gains in short periods of time (i.e., jumps)</td>
<td>How will the targets which impact the calibration of the jump process (e.g., skew and kurtosis) be expressed?</td>
<td>Use Conning's existing calibration.</td>
</tr>
<tr>
<td>5</td>
<td>Equity scenarios need to reflect the possibility of a very long recovery after a period of losses</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>There should be higher correlation in the tail scenarios between different equity indices.</td>
<td>Should the Conning calibration be utilized or would regulators like to calibrate to a specific historical period?</td>
<td>Use Conning's existing calibration.</td>
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<tr>
<td>7</td>
<td>There should be a link between equity returns and Treasury yields</td>
<td>1. Do regulators want a link between equity and Treasury scenarios? 2. If so, are any changes to the functional relationship between equities and Treasuries desired?</td>
<td>Use Conning's existing calibration.</td>
</tr>
<tr>
<td>8</td>
<td>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.</td>
<td>Do regulators want any changes to the methodology used to generate credit rating transitions, defaults, and dynamic spreads?</td>
<td>Use Conning's existing calibration.</td>
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<td>9</td>
<td>Separate yield curves should be generated by rating, and they should be linked to each other</td>
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<td>10</td>
<td>The spread between Treasuries and corporate bonds should be stochastic</td>
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<td>11</td>
<td>The ESG should include bond credit rating transitions and they should be dynamic</td>
<td>Do regulators want to change any of the assumptions driving spreads, rating transitions, and defaults?</td>
<td>Use Conning's existing calibration.</td>
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### Model Parameters

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<th>Kappa</th>
<th>Sigma</th>
<th>Lambda0</th>
<th>Lambda1</th>
<th>Gamma</th>
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### Mean Reversion Speed

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<th>Target</th>
<th>Calculated</th>
<th>Target</th>
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<td>7.22%</td>
<td>7.22%</td>
<td>3.60</td>
<td>3.60</td>
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<tr>
<td>6.29%</td>
<td>6.29%</td>
<td>3.69</td>
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</tr>
<tr>
<td>3.47%</td>
<td>3.47%</td>
<td>16.80</td>
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</table>

### Long Term Levels

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Target</th>
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</thead>
<tbody>
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<td>1-Year</td>
<td>2.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>20-Year</td>
<td>3.50%</td>
<td>3.50%</td>
</tr>
</tbody>
</table>

### Diff

0.0%

### Time Shift Function

0 \(-0.1271\)

Auxiliary functions which are applied to the short rate from CIR 1
March 25, 2021

From:  Rhonda Ahrens, Chair  
The Longevity Risk (E/A) Subgroup

To:    Mike Boerner, Chair  
The Life Actuarial (A) Task Force

Subject: The Report of the Longevity Risk (A) Subgroup to the Life Actuarial (A) Task Force

The Longevity Risk (A) Subgroup has not met since the Fall National Meeting and is not likely to meet prior to the Summer National Meeting. A Drafting Group has been formed to contemplate reserve requirements related to pension risk transfer (PRT) and longevity reinsurance (LR) transactions that are more specific to the PRT reserves and are not solely related to the longevity component. The Subgroup will reconsider C-2 RBC for PRT products or LR transactions after reviewing the Drafting Group’s recommendations for resolution of identified issues.
March 25, 2021

From: Rhonda Ahrens, Chair
The Guaranteed Issue (GI) Life Valuation (A) Subgroup

To: Mike Boerner, Chair
The Life Actuarial (A) Task Force

Subject: The Report of the GI Life Valuation (A) Subgroup to the Life Actuarial (A) Task Force

The GI Life Valuation (A) Subgroup has not met since the Fall National Meeting and may meet prior to the Summer National Meeting depending on availability of subgroup members or their concerns. Otherwise, it is in a dormant/monitoring mode given that there have been no new known studies of GI Life mortality that could prove useful in formulating a new prescriptive requirement for the reserves for GI Life products. One direction we could go is to continue consideration of how to adopt the GI Life table but require companies with credible experience to use a credibility weighted mortality whether their experience is lower or higher than the table.
March 17, 2021

From: Fred Andersen, Chair
The Experience Reporting (A) Subgroup

To: Mike Boerner, 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 met on March 2, 2021 (see the attached minutes) to discuss plans for collecting life insurance mortality and policyholder behavior data using the NAIC as the statistical agent. There are plans to start developing mandatory reporting of variable annuity data and to continue work on evaluating actuarial aspects of accelerated underwriting in 2021.
Experience Reporting (A) Subgroup
Virtual Meeting
March 2, 2021

The Experience Reporting (A) Subgroup of the Life Actuarial (A) Task Force met March 2, 2021. The following Subgroup members participated: Fred Andersen, Chair (MN); Perry Kupferman (CA); Wanchin Chou (CT); Nicole Boyd (KS); Rhonda Ahrens (NE); Bill Carmello (NY); and Mike Boerner (TX).

1. Received an Update on the Mortality Experience Data Collection Project

Pat Allison (NAIC) provided an overview of the mortality experience data collection project (Attachment 1). She said companies will be asked to submit data for the 2018 and 2019 observation years using 2020 and 2021 Valuation Manual requirements. Data for 129 companies, representing 90% of industry claims, is expected to be submitted by the Sept. 30 deadline. Ms. Allison said that VM-51, Experience Reporting Formats, lists the data items to be collected and the format to be used for record submission. She said validity checks and reasonability checks will be used to screen the data for accuracy. Jim Stinson (NAIC) discussed the internal NAIC reports, designed using the Tableau software, to facilitate the reasonability checks. Ms. Allison noted that the reasonability checks will include multiyear comparisons. She said data from the Kansas data call was used to help develop the validity and reasonability checks. She requested Subgroup feedback on the data screening approach.

An interested party asked whether each participating company will be asked to sign an agreement that outlines the details of the engagement. Dan Schelp (NAIC) responded that each company will execute a click agreement with the NAIC at the time of data submission. Ms. Allison discussed the multiple methods used to determine whether company submissions are acceptable. She noted the automated validity checks within the Regulatory Data Collection (RDC) tool. She said that the NAIC actuarial team will perform additional data validity checks. The results of the data validity checks will be shared with the submitting companies. Ms. Allison closed with a discussion of the responsibilities of participating companies.

Having no further business, the Experience Reporting (A) Subgroup adjourned.

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March 15, 2021

From: Fred Andersen, Chair  
     The Indexed Universal Life (IUL) Illustration (A) Subgroup

To: Mike Boerner, Chair  
    The Life Actuarial (A) Task Force

Subject: The Report of the Indexed Universal Life (A) Subgroup to the Life Actuarial (A) Task Force

The Indexed Universal Life Illustration (A) Subgroup has not met since the Fall National Meeting. The Subgroup plans to meet again after any significant market developments following the adoption of Actuarial Guideline XLIX-A, The Application of the Life Illustrations Model Regulation to Policies with Index-Based Interest Sold On or After November 25, 2020 (AG 49-A).
April 8, 2021

From: Pete Weber, Chair
The Variable Annuity Capital and Reserve (E/A) Subgroup

To: Mike Boerner, Chair
The Life Actuarial (A) Task Force

Subject: The Report of the Variable Annuity Capital and Reserve (E/A) Subgroup to the Life Actuarial (A) Task Force

The Variable Annuity Capital and Reserve (E/A) Subgroup has not met since the Fall National Meeting. The Subgroup will monitor results of companies implementing the Variable Annuity framework and stand ready to consider any requests of the Task Force or the Life Risk-Based Capital (E) Working Group.
Valuation Manual (VM)-22 (A) Subgroup  
Virtual Meeting  
March 17, 2021

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met March 17, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Ahmad Kamil, Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Nicole Boyd (KS); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello and Amanda Fenwick (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. **Voted to Use Two Risk Categories for VM-22 Valuations**

Mr. Sartain said the consideration before the Subgroup is whether to have separate reserve categories for deferred and income annuities or have a single reserve category including both product types.

Mr. Carmello made a motion, seconded by Ms. Ahrens, to require two reserve categories for VM-22, Statutory Maximum Valuation Interest Rates for Income Annuities, with the requirement defaulting to a single risk category if the motion failed. The motion passed 6–4, with California, Kansas, Missouri, Nebraska, New York and Virginia in favor of the motion.

2. **Tabled a Motion to Retain the VM-20 Integrated Risk Management Language**

Ms. Lam made a motion, seconded by Mr. Leung, to retain the language in Section 5A of VM-20, Requirements for Principle-Based Reserves for Life Products, that allows for aggregation of products with significantly different risk profiles if the products are managed as part of an integrated risk management process. Ben Slutsker (American Academy of Actuaries—Academy) said the Academy Annuity Reserves and Capital Work Group (ARCWG) recommendation to have principles for aggregation was accompanied by a recommendation for having a single reserve category. He said, given the Subgroup vote for two reserve categories and the lack of clarity surrounding the integrated risk management language, the ARCWG favors removing the language in Section 5A from consideration for VM-22. Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI concurs with the ARCWG position. Ms. Hemphill said the language should be removed because it is unclear and may result in differing state insurance regulator interpretations and applications. Mr. Carmello and Ms. Ahrens said they believe the language serves as a useful regulatory tool.

Ms. Lam said she would be willing to amend the motion to include principles that might help clarify the VM-20 language but was unable to immediately offer specific language. Mr. Sartain suggested tabling the motion. Mr. Carmello made a motion, seconded by Ms. Lam, to table the motion. The motion passed unanimously.

3. **Voted to Retain the VM-20 SERT Language**

Mr. Sartain asked the Subgroup to consider whether the language in VM-20 Section 6.A.2.b.iv prohibiting the grouping of “contract types with significantly different risk profiles” when performing the stochastic exclusion ratio test (SERT) should be retained for VM-22.

Mr. Carmello made a motion, seconded by Ms. Hemphill, to retain VM-20 Section 6.A.2.b.iv language. The motion passed unanimously.

Having no further business, the VM-22 (A) Subgroup adjourned.

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The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met March 3, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Ahmad Kamil and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Nicole Boyd (KS); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Anna Krylova (NM); Amanda Fenwick (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Discussed Field Test Timing

Mr. Sartain said the VM-22, Statutory Maximum Valuation Interest Rates for Income Annuities, field test is now scheduled from February 2022 through June 2022. He said the new date will necessitate a shift in the target date for the implementation of the revised VM-22 beyond January 2023 as initially planned. He said an additional change is the inclusion of capital considerations into the scope of the field test as a means of updating C-3 Phase 1. He noted that different conditional tail expectation (CTE) measures will be used for the annuity valuation and the C-3 Phase 1 efforts.

2. Discussed the Product Scope of the Proposed ARCWG Framework

Chris Conrad (American Academy of Actuaries—Academy) said the Academy Annuity Reserves and Capital Work Group (ARCWG) has determined that the scope of VM-22 should include both deferred and immediate annuities, on both an individual and group basis. He said account value-based deferred annuities, including single premium deferred annuities (SPDAs), flexible premium deferred annuities (FPDAs) and fixed indexed annuities (FIAs), will be in scope. Examples of the payout annuities that are in scope are single premium immediate annuities (SPIAs), pension risk transfers (PRTs), deferred income annuities (DIAs) and structured settlement contracts. He said the ARCWG has proposed excluding, for now, guaranteed investment contracts (GICs), stable value contracts and funding agreements from the scope of VM-22, primarily because those products exhibit less optionality and are tied to other regulations. He said the application of the framework to in-force business is still in question. Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI suggests exempting products that are expected to consistently pass the exclusion test. Mr. Sartain asked if the certification method of exclusion testing would sufficiently address the ACLI concern. Mr. Bayerle said the ACLI would prefer an approach similar to the treatment of guaranteed issue (GI) products.

3. Discussed Starting Assets and Discount Rates

Mr. Conrad said the ARCWG recommends that the treatment of starting assets and discount rate follow the requirements of VM-21, Requirements for Principle-Based Reserves for Variable Annuities, with a safe harbor of using the new money re-investment rate for net asset earned rate (NAER) discount rate upon depletion of assets to avoid anomalous re-investment rates when the asset base is small. Mr. Bayerle said the ACLI agrees but would like the ARCWG to revisit making borrowing cost restrictions more principle-based. Mr. Tsang suggested using a higher cost of borrowing when assets are depleted. Mr. Conrad said the Academy’s proposal provides a guardrail that would allow a company the option to choose a more conservative rate. He said the issue may surface during the field test and can be addressed at that time.

4. Discussed Allocation of Policy Reserves

Ben Slutsker (Academy) said the method of reserve allocation affects the reporting categories in the annual financial statement, as well as per policy comparisons to cash value floor, which may have tax considerations. He said those considerations make allocation a sensitive issue. He said the ARCWG proposes a rigid approach that looks at the greatest present value of accumulated deficiencies (GPVAD) under a moderately adverse scenario. Ms. Hemphill said she is concerned about using a single scenario because it can be overly influenced by the business that drives the GPVAD for the CTE 70 scenario. She said the Texas Department of Insurance (TDI) recommended in its comment letter the disclosure of reserves for certain categories of business separately. She proposed using those same categories as the basis of an approach that could be scaled for the purpose of allocation. Mr. Slutsker said he will discuss the approach with the ARCWG. Mr. Sartain said he will add the disclosure proposal to the issues list.

Having no further business, the VM-22 (A) Subgroup adjourned.
The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Feb. 24, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Elaine Lam, Ahmad Kamil and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Nicole Boyd (KS); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Anna Krylova (NM); Bill Carmello (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. **Discussed Adding Longevity Risk to the Exclusion Test**

Mr. Sartain said the topic of adding longevity risk to the exclusion test will be added to the issues list for consideration during the field test.

2. **Discussed Whether to Allow a Policy with a CDHS to be Eligible for Exclusion from the Stochastic Reserve**

Mr. Sartain said that VM-20, Requirements for Principle-Based Reserves for Life Products, does not allow a policy supported by a clearly defined hedging strategy (CDHS) to be excluded from the stochastic reserve calculation. He said the reasons given on the Feb. 17 Subgroup call were: 1) the existence of a CDHS implies that there is material economic risk that should preclude the associated policies from being excluded from the stochastic reserve; and 2) the possibility that policies could be excluded due to hedging is discomforting. Ben Slutsker (American Academy of Actuaries—Academy) said the Academy believes that hedging programs should generally require stochastic reserve modeling, with the exception of hedging programs that are solely for the purpose of funding interest credits. He said fixed indexed annuities (FIAs) are examples of products that inherently have hedging in their designs, may not contain significant basis risk and should be allowed to use an exclusion test. Mr. Slutsker agreed to have the Academy look at the existing language in VM-21, Requirements for Principle-Based Reserves for Variable Annuities, to determine how it might be revised to address non-variable annuity hedging programs.

3. **Discussed Reinvestment Guardrails**

Chris Conrad (Academy) said that given the emphasis on the general account spread for fixed annuity products, the Academy is asking the Subgroup to revisit the existing fixed income guardrail of 50% A-rated bonds and 50% AA-rated bonds. He said the current split no longer reflects industry experience. He said the Academy recommends using the VM-22, Statutory Maximum Valuation Interest Rates for Income Annuities, credit quality distribution, which better represents average industry holdings. Ms. Hemphill said the Texas Department of Insurance (TDI) comment letter lists its concerns with the Academy recommendation. Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI supports the Academy recommendations. Steve Tizzoni (Equitable) said the Equitable comment letter expresses its belief that spread limits on reinvestments and existing assets ensure that there is no outsized reliance on excess credit spreads. He said Equitable’s letter suggests that the timing for contraction of spreads should be shortened.

Mr. Sartain asked for a brief history of the data supporting the VM-22 credit quality distribution categories. Mr. Conrad said the bond data was obtained for the Academy C-1 Working Group, which provided granular data from the years 2011 and 2013. Mr. Tsang said he supports guardrails that consider industry trends but believes boundaries are necessary. He suggested that members of industry develop a proposal for state insurance regulator consideration. Mr. Bayerle said the ACLI will work to develop proposals for both life and annuity products.

Having no further business, the VM-22 (A) Subgroup adjourned.
The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Feb. 10, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Elaine Lam, Ahmad Kamil and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT) and Craig Chupp (VA).

1. **Announced the Formation of a PRT Drafting Group**

Mr. Sartain said pension risk transfer (PRT) business is often originated in other countries, which raises the question of whether U.S. population tables are appropriate when reserving for PRT business. He said a regulator-to-regulator drafting group is being formed to look at this and other issues related to PRT business.

2. **Discussed Treatment of Longevity Risk for Exclusion Testing**

Ben Slutsker (American Academy of Actuaries—Academy) said the Academy proposed a stochastic exclusion ratio test (SERT) that had an up shock and a down shock to longevity for each of the 15 designated equity and interest scenarios. The greatest of the scenarios would become the numerator of the SERT. A baseline economic scenario without shocks would form the denominator of the SERT. Mr. Slutsker discussed a deterministic certification option, indicating that a stochastic run may not be necessary for contracts without policyholder options. He said a single deterministic scenario calibrated to a given conditional tail expectation (CTE) level may be sufficient. He said other criteria will have to be met.

Ms. Hemphill said that mortality is just one consideration to be addressed by the exclusion test; other risks will also need to be considered. She noted hedging as one such item that will need to be given consideration.

Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI believes that it is not clear whether including longevity as one of the considerations for stochastic testing makes sense. He said applying margins to the mortality assumptions might be a better way to capture longevity risk.

Ms. Hemphill said the Texas Department of Insurance (TDI) has concerns about having fixed SERT parameters that apply universally. She suggested incorporating a principle-based materiality threshold into the SERT determination.

3. **Discussion of Whether to Allow Risks to Be Combined**

Mr. Sartain asked if interest rate risk and longevity risk should be netted together. Mr. Slutsker said the intent of netting the two risks is to reflect any covariance that may exist. He said it also facilitates implementation. Mr. Tsang said he prefers keeping blocks of business separate to allow for a meaningful understanding of the specific risks in each block. Mr. Slutsker said that approach is similar to the deterministic certification option. He said the option does not eliminate the stochastic calculation but requires it less frequently.

4. **Discussed Exclusion Testing for FIAs**

Mr. Tsang discussed the reasoning for not allowing products for which a company uses a clearly defined hedging strategy (CDHS) to qualify for the exclusion tests. Mr. Sartain noted that if the VM-20, Requirements for Principle-Based Reserves for Life Products, language were to be used, fixed indexed annuities (FIAs) without guaranteed minimum benefits would not be eligible for exclusion.

Having no further business, the VM-22 (A) Subgroup adjourned.
Valuation Manual (VM)-22 (A) Subgroup
Virtual Meeting
February 3, 2021

The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Feb. 3, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Elaine Lam, Ahmad Kamil and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); William Leung (MO); Seong-min Eom (NJ); Bill Carmello (NY); and Rachel Hemphill and Karen Jiang (TX).

1. **Discussed the Standard Projection Amount**

   Mr. Sartain said that a straw poll taken during Subgroup’s Jan. 27 showed that most Subgroup members prefer limiting the standard projection amount (SPA) to a disclosure item instead of a stochastic reserve floor. He asked if anyone who prefers the SPA as a disclosure item had an alternative stochastic reserve floor in mind other than the cash value. No Subgroup members indicated a desire for an alternative stochastic reserve floor.

2. **Discussed Aggregation Principles**

   Mr. Sartain said the final straw poll taken during the Subgroup’s Jan. 27 meeting asked whether the language governing the criteria for aggregating products based on the management of associated risks should remain principle-based, be more prescriptive or be removed from the framework. He said that members voted, by a small margin, to remove the language. Ben Slutsker (American Academy of Actuaries—Academy) said the Academy initially thought that the language would apply to exclusion testing criteria, as well as reserving. He said now that the Subgroup is separately considering aggregation criteria for exclusion testing, the Academy believes the language is not needed for reserving. Brian Bayerle (American Council of Life Insurers—ACLI) and Mr. Leung agreed with the Academy’s position. Ms. Lam said she considers the reserve categories as guardrails and believes the principles may still be necessary within the specific categories. Mr. Sartain said the principles are vague and might be difficult to regulate. He asked why it should matter whether their risks are managed together if the products can offset one another. Ms. Hemphill said if there are clear reasons that certain products should not be aggregated, that might be an indication that additional reserve categories are needed. Mr. Kamil said the principles should be further investigated before deciding they are not needed. Mr. Sartain said discussion will continue, with the goal of a final vote on the issue in March.

3. **Discussed Aggregation for Exclusion Testing**

   Mr. Sartain said that VM-20, Requirements for Principle-Based Reserves for Life Products, requires that the types of business aggregated for exclusion testing must be similar. He asked if participants agreed that the VM-20 concept should be included in the language of the principle-based reserving (PBR) for non-variable annuities. Mr. Slutsker said the Academy would not be opposed to application of the principle for the purpose of exclusion testing but would be cautious about the granularity of exclusion testing restrictions. Mr. Sartain said the VM-20 language would be used as it currently stands. Ms. Hemphill said she is supportive of that position.

4. **Discussed Other Exclusion Testing Issues**

   Mr. Bayerle said the ACLI comments include a suggestion that a materiality threshold be considered. He said decisions on the exclusion test should be deferred until they can be informed by the results of the field test. He said the ACLI has concerns about the inclusion of longevity risk in exclusion testing. He said products that will always be able to pass the exclusion tests should possibly be considered out of scope. He said the exclusion tests should be performed at the highest level of aggregation.

Having no further business, the VM-22 (A) Subgroup adjourned.
The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Jan. 27, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Nicole Boyd (KS); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Russell Toal (NM); Bill Carmello (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Discussed the Academy’s Preliminary Framework Elements for Fixed Annuity PBR

The Subgroup discussed whether the Valuation Manual should have separate categories for deferred annuities and payout annuities. Ms. Ahrens advocated for having separate chapters in recognition of the inherent differences in the products. She said the benefits of risk diversification between the products is not a sufficient reason for aggregating the products for the purpose of calculating reserves. She said she is comfortable with the two reserve categories for now. She noted that additional categories can be developed later if the necessity arises due to product innovation. Mr. Yanacheak said he is less concerned with whether deferred annuities and payout annuities are separated by chapters. He said he is more interested in developing principles that would apply appropriate reserving treatment for the two types of annuities.

The Subgroup took a straw poll on whether there should be one or two reserve categories for reserve aggregation. The vote was seven to five in favor of two reserve categories. Mr. Sartain noted that two or more categories could be required for disclosure.

A second straw poll asked whether the standard projection amount (SPA) should be used as a reserve floor or solely for disclosure. The vote was seven to four in favor of limiting the SPA to a disclosure item. The Subgroup agreed that multiple reserve categories should be required for the SPA.

The final straw poll asked whether the language governing the criteria for aggregating products based on the management of associated risks should remain principle-based, be more prescriptive, or be removed from the framework. There were four votes for removal of the principle-based language, three votes for retaining the principle-based language, and three abstentions. No members voted for more prescriptive language. Two members left the call prior to voting.

Having no further business, the VM-22 (A) Subgroup adjourned.
The VM-22 (A) Subgroup of the Life Actuarial (A) Task Force met Jan. 20, 2021. The following Subgroup members participated: Bruce Sartain, Chair, and Vincent Tsang (IL); Elaine Lam and Thomas Reedy (CA); Lei Rao-Knight (CT); Mike Yanacheak (IA); Nicole Boyd (KS); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Russell Toal (NM); Bill Carmello (NY); Rachel Hemphill and Karen Jiang (TX); Tomasz Serbinowski (UT); and Craig Chupp (VA).

1. Discussed the Academy’s Preliminary Framework Elements for Fixed Annuity PBR

Mr. Sartain explained that the Subgroup will address the subject of aggregation separately for stochastic reserve calculation and exclusion testing. Ben Slutsker (American Academy of Actuaries [Academy] Annuity Reserve and Capital Work Group—ARCWG) said the aggregation of the reserve categories when calculating the conditional tail expectation (CTE)-70 allows for the benefits of diversification. He said the ARCWG favors a single reserving category for reserve aggregation. He said the ARCWG is open to considering multiple categories for exclusion testing aggregation.

Mr. Sartain asked commenters to discuss the portions of their comment letters that address aggregation. John Robinson (MN) said his comment letter (Attachment Twenty-One-A) reflects his concern with the auditability of non-variable annuity reserves if deferred and payout annuities are aggregated for the stochastic reserve calculation. Mr. Sartain asked if the auditability goal could be accomplished with additional disclosures. Mr. Robinson responded that even if the deferred and payout reserve numbers are separately disclosed, reconciling them to the aggregate reserve will be difficult. He reiterated his preference for at least two reserving categories. He also said the criteria applicable to aggregation requires greater definition.

Ms. Hemphill said page 3 of her comment letter (Attachment Twenty-One-B) addresses aggregation. She said the aggregation principles in the preliminary framework will lead to inconsistent aggregation across companies. She said aggregation based on the principles would be difficult to review. She said she favors full aggregation with disclosures of the aggregation benefits and application of the standard projection amount (SPA).

Brian Bayerle (American Council of Life Insurers—ACLI) said the ACLI comment letter (Attachment Twenty-One-C) supports the principle that aggregation be consistent with how assets are managed. He said the ACLI supports full aggregation with the disclosure of aggregation benefits.

Steve Tizzoni (Equitable) said the Equitable comment letter (Attachment Twenty-One-D) supports full aggregation because it reflects the diversification benefits that are core to the insurance industry. He also spoke in favor of the SPA as a floor to ensure that the diversification benefit is not excessive.

A straw poll was taken on the issue of whether, in the determination of the stochastic reserve, all fixed annuity business should be aggregated as a single reserving category with the appropriate disclosures or more than one reserving category should be required for aggregation. The Subgroup member voting was split evenly, with both options getting six votes. Mr. Sartain, the chair, refrained from voting. He suggested that given the tightness of the voting, the topic requires more discussion.

Having no further business, the VM-22 (A) Subgroup adjourned.
Comments On:

Preliminary Framework Elements for Fixed Annuity PBR

John Robinson, Director PBR – Valuation Actuary, Minnesota

I thank and congratulate the ARWG for this work.

I would like to comment on Slide 21, Aggregation.

The principles enunciated are focused on how the business is managed, particularly from a risk perspective. However, the fourth ARWG Pillar of Objective (Slide 2) calls for a process that is, among other things, auditable. I believe it is the intent of ARWG that the pillars on Slide 2 supersede the principles on Slide 21.

“Auditable” means that the process must facilitate the explanation of results. Qualified Actuaries performing reserve calculations have traditionally determined and analyzed reserves by product type. This facilitates insight and understanding when explaining results to company management, regulators and other actuaries.

The promise of PBR is that reserves will be “right-sized” relative to the company’s circumstances. In the case of deferred annuities, the conventional wisdom is that the current formula-based methods produce worst-case-scenario, overly conservative reserves; so, right-sizing the reserves should decrease them. On the other hand, the current formula-based reserves for immediate annuities generally understate reserves due to the lock-in of out-dated mortality and interest assumptions; so, right-sizing the reserves should increase them. In order to determine whether this promise has been kept, it will be necessary to determine reserves for deferred annuities and immediate annuities separately.

I therefore call for the establishment of VM-22 Reserving Groups which would, at a minimum, separate deferred and immediate annuities.

Thank you.

John Robinson FSA, FCA, MAAA
Dear Bruce:

We appreciate the opportunity to provide input on the draft ARWG framework.

- Reinvestment mix should represent the fixed income assets portion of the investment portfolio and reflect moderately adverse conditions.
- A CDHS concept is needed for future hedge modeling that materially reduces the reserves.
- Aggregation requirements and methodology should be clearly defined.
- The design of the exclusion test needs to be clarified and consider non-tested risk factors that may have material impact on the ratio test results, e.g., liability assumptions and hedging. The ratio test passing criteria should be linked to the company’s definition of materiality, with the VM-22 threshold as a guardrail.
- The implication of the PBR reserve framework on the non-PBR capital framework needs to be carefully considered.
- Comments for other topics.

Sincerely,

Karen Jiang, FSA, MAAA, FRM
PBR Actuary
Actuarial Office, Financial Regulation Division

Rachel Hemphill, Ph.D., FSA, FCAS, MAAA
PBR Team Lead
Actuarial Office, Financial Regulation Division

CC    Ben Slutsker, ARWG at Benjamin_Slutsker@newyorklife.com
      Reggie Mazyck, NAIC at Rmazyck@naic.org
      Mike Boerner, TDI at mike.boerner@tdi.texas.gov
Appendix I: Requested Feedback

Reinvestment Mix

- Comments on setting limits to the current VM-22 credit quality mix? (Slide 11)

A few considerations about the credit quality mix:

1. It should represent the fixed income investment portion of the asset portfolio only. The current proposal does not do this.
2. It should be based on the latest industry data. The current proposal does not do this.
3. Using a typical industry average fixed income portfolio mix is not conservative as needed for the purpose of setting reserves. A mix with higher credit quality to reflect moderately adverse conditions is more appropriate. The current proposal does not reflect this.
4. Currently VM-22 adds additional conservatism not in the current VM-22 credit quality mix by applying a 25 bps spread deduction; without this spread deduction in the ARWG framework, the credit quality mix should be more conservative. The current proposal does not reflect this.
5. It is desired that the same reinvestment mix guardrail be used for all of VM-20, VM-21 and the new VM-22.

Additionally, we are concerned with the grading from short-term spreads to long-term spreads, especially if there is an option to liquidate currently held hedges (as there is in VM-21) reflecting an unrealistic gain in reinvestments when short-term spreads are high as of the valuation date. This problem currently applies to VM-20 and VM-21. Additionally, it may be preferable to use a net yield pickup based criteria for reinvestments instead of a guardrail based on a specific asset mix, which would reduce implementation constraints seen to date with the alternative reinvestment guardrail.

Index Credit Hedging Treatment

- Does modeling breakage hedge expense seem reasonable? (Slide 13)

1. Generally speaking, a CDHS concept (having a clearly documented hedging strategy and program) is needed in cases where reserves or TAR is materially reduced. Future hedging should not materially reduce reserves or TAR if it is not a CDHS. For straightforward types of hedging, the CDHS documentation should only be simpler to provide.

2. Hedge breakage expense assumptions

   a. The wording of “hedge expense” should not be confused with the hedge cost that needs to be reflected in the projections of the hedge modeling.
   b. 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.

c. The 1% minimum allowed seems too low. How does the 1% breakage expense reflected as either the additional expense or the reduced investment income compare with the 5% reduction in future hedging benefit for reserves (on a PV basis)? A low E factor needs to be supported by the projected hedge gain and loss being within a close range of 100%. VM-21 suggests a range of 80-125%. With a lower minimum expense/error factor should this range be narrowed? The rationale for a lower expense factor (having lower basis risk and greater effectiveness) suggests that we should expect a back-testing result much closer to 100%.

d. The same requirement should be considered for VM-20 hedge modeling which are mostly index credit hedging for IUL products.

3. Will companies request special hedge accounting treatment from SAPWG similar to SSAP 108?

Aggregation

- Any additional principles to include, or suggested modifications or elaboration of principles listed? (Slide 21)
- Impose differences in aggregation for exclusion testing purposes? (Side 22)

We have a concern with this approach, related to concern with the current VM-20 approach. We are not seeing clear or consistent approaches to what "managed together" or "managed separately" means. A fuzzy requirement here is no requirement. If the point is to generally allow full aggregation, why even have a fuzzy requirement? What are examples that one could not reasonably argue should be aggregated?

Consider 1) an aggregation certification to demonstrate that the aggregation chosen meets the requirements if they can be clearly defined and/or 2) if companies change aggregation method they need to get domicile commissioner’s approval.

We prefer VM-22 define standard reserving categories for all exclusion test, stochastic reserve and standard projection amount purposes. There should be no aggregation of products with significantly different risk profiles for exclusion testing, but for products that fail the test and go through the SR/SPA calculation, aggregation is allowed but with the reserves for each individual category and the aggregation benefit being disclosed. SR and SPA are supposed to use the same aggregation method.

Ideally, for aggregation benefit disclosure, we would review these product categories:

- Deferred Annuities
  - FIAs with GLBs
  - FIAs without GLBs
- FDAs with GLBs
- FDAs without GLBs
- Payout Annuities
  - SPIAs
  - PRT
  - DIAs
  - SSC

If this is too granular in some instances, a minimum split would include fixed annuities with GLBs, fixed annuities without GLBs, SPIAs, PRT, and then all others.

Exclusion Testing
- Include testing of longevity risk in the ratio test? (Slide 25)
- Provide potential deterministic calculation option for policies with limited optionality? (Appendix V)

1. Mortality Component: The shocks should be the greater of the mortality margin magnitude or the fixed amount determined by the ARWG.

2. Threshold: The threshold needs to consider the absolute dollar amount and be linked to the company's materiality standard. A group of contracts should not be able to be excluded from VM-22, if the aggregate variability under the scenarios exceeds the company's materiality standard. That is, if the economic or mortality variability is material based on the company's definition of materiality, then the SERT is failed. Then, any fixed threshold selected by the ARWG for the SERT (e.g., 6%) is just a "guardrail" on the company's defined materiality standard. Note that this is more principles based than an SERT with a fixed threshold and also applies as a critique of VM-20's SERT.

3. Impact of Liability Assumptions: Will exclusion testing include SPA results as part of the 16 scenario calculations, if it is for more than disclosure? If you are also being excluded from the SPA, the SPA needs to be somehow reflected as part of the SERT process. What if over-optimistic liability assumptions (e.g., policyholder inefficiency) drive passing the SERT? This reflects a difference between VM-20 and VM-21. VM-20 has a SERT but does not exclude you from the NPR. VM-21 has an SPA but no SERT.

4. Impact of Hedging: VM-20 does not allow a company to exclude a group of policies for which there is one or more CDHS from stochastic reserve requirements. VM-22 does not require policies with hedging to automatically fail exclusion test. Again, what if hedging drives the passing of the SERT? What hedging documentation and support is needed if a SERT is performed that relies on hedging? Should results be shown with and without hedging? This is another place where we should consider alignment between the two VM chapters.
Allocation Methodology

- Any alternative methods to consider? (Slides 27-28, Appendix III)

A single scenario won’t capture individual policy risk. Neither will immediate election.

Reserve allocation is not only for tax purpose but also for RBC purpose. For products that calculate RBC using a factor-based approach, reserves need to be allocated if they are aggregated with other products that use a different RBC approach, e.g., C3P1. Need to seek input from the LRBC group. One conservative approach is to use the standalone reserves for RBC purpose.
Appendix II: Additional Feedback

Reflecting Risk in Moderately Adverse Conditions (Slide 2)

Just a note that this is fundamentally different than the PBR approach for economic scenarios. A CTE(70) reflects both less than moderately adverse and more than moderately adverse scenarios, in an average. For non-economic variables that are not stochastically modeled we may partition particular risks or scenarios into moderately adverse and beyond moderately adverse, which needs to be reflected in capital only. But the more we move to stochastic modeling of risks, reserves will just generally be increased by tail risk, both above and below a “moderately adverse” threshold, with a lesser sensitivity to deeper in the tail risks or scenarios than capital.

Potential Management Actions (Slide 2)

Potential management actions reflected should only be those that, at a minimum, are pursuant to documented company policy and are not inconsistent with historical actions.

Principles (Slide 2)

Speaking of Principles, will VM-22 cite/follow the VM-21 principles?

SPA (Slide 3)

Note that the SPA is actually neither formulaic nor a floor. The types of arguments you present here against the SPA seem to be wrestling with the ghosts of past requirements (the old standard scenario), rather than addressing the living, evolving requirements of the Valuation Manual. In contrast, a CSV floor is both formulaic and a prescriptive floor. Is the ARWG opposed to a CSV floor?

Existing PBR Frameworks (Slide 3)

For each deviation from the current VM-21, please outline whether: 1) a deviation is necessary due to unique product features or risk characteristics between the policies in scope (describe) or 2) a deviation from the current VM-21 is proposed that would be a better requirement for both VM-21 and VM-22 (describe). Similar comparisons to VM-20 are also preferable.
Implementation Period (Slide 9)

We need to be mindful of potential inconsistency between reserves and capital. If a principles-based capital framework is not completed/updated, then interim revisions may be needed if the amount of business under the new VM-22 framework is material.

Can a company wait until the end of the transition period to start PBR, but then apply PBR to the issues from the transition period?

Mortality (Slide 15)

What does “unsupported judgment” mean? Why should there be any unsupported judgment? Let’s not perpetuate this phrasing.

Will international lives also use 2012 IAM Basic Table with Scale G2? This may not be appropriate in many cases.

What number of years of future improvement will be used?

Policyholder Behavior (Slide 16)

Margins: VM-20 and VM-21 have analogous requirements - both start with individually determined margins and then one substitutes margins based on the joint distribution while the other discusses a correlation adjustment to reflect the joint distribution. Should these be harmonized, along with VM-22?

VM-22 reporting should quantify the impact of all margins, showing the effect with and without. VM-22 reporting should also ensure A/E’s are provided with E being the anticipated or best estimate assumption.

NGEs (Slide 18)

Will this reflect company policy and past actions, and also include any legal and/or reputational considerations in determining anticipated NGEs?

Joint Payouts & Supplemental Benefits (Slide 19)

For VA products with joint payouts and/or supplemental benefits, similar requirements should be added to VM-21.
Reinsurance (Slide 20)

VM-20 requires that treaties be modeled either 1) if they qualify for credit for reinsurance or 2) if modeling them reduces surplus. This is a reasonable treatment, but VM-21 does not have the 2nd. We recommend the VM-20 treatment for VM-22. This should also be considered for VM-21.

Materiality

The ARWG will need to address materiality and simplifications/approximations/modeling efficiency techniques. If you are basing on VM-21, note that VM-21 is missing a consideration of the aggregate impact of all approximations and so does not have an assurance that the reserve is not materially understated in aggregate.

VM-20 has the requirement that individual approximations don't bias reserves downward. This provides some assurance about the aggregate impact, but is not the same as a consideration of the aggregate impact. Possibly all three should have a consideration of the aggregate impact.

Exclusion Test Methodology (Slide 25)

Item h) – Appendix V is mainly about the "certification" but not how the DR itself will be calculated. It may be reasonable to just do DR calculations in some situations, but this depends on the methodology/scenarios.

Allocation (Slide 28)

Again, need to consider non-US mortality.

VM-31 Disclosures (Slide 29)

What certifications will be included for the VM-22 reporting? Will they follow VM-20 or VM-21?

Hedge back-testing should be shown for the full time period current strategy has been in place. This should also apply to VM-21. VM-20 may also need additional details.
CTE(70)

For products with market value adjustment, CTE(70) needs to be floored at cash surrender value with MVA which varies by scenarios.

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.G requirement.
Brian Bayerle  
Senior Actuary

December 18, 2020

Mr. Bruce Sartain  
Chair, NAIC VM-22 (A) Subgroup

Re: ARWG Preliminary Framework

Dear Mr. Sartain:

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the exposed presentation deck on the Academy Annuity Reserve Working Group (ARWG) preliminary framework for fixed annuity PBR.

ACLI is appreciative of the hard work of the ARWG in developing the framework for fixed annuity PBR. We believe the framework is going in the right direction, and we offer the following feedback on the five directed topics and additional comments:

1. Reinvestment Mix

We believe the 50% A / 50% AA fixed income reinvestment guardrail should be revisited, and regulators should consider using a more industry-consistent reinvestment mix in VM-22 and other principle-based reserves. As credit spreads and defaults are already prescribed, this level of conservatism in the reinvestment mix should not be necessary. Revisiting this reinvestment restriction for all products was also flagged for LATF review by the NAIC staff letter and a VM-21 drafting note. We would support the use of VM-22 credit quality mix as asset mix limitation for VM-22 reinvestment assets as proposed by the ARWG as it is reasonably industry-consistent for products in scope of VM-22. The VM-22 spread reflects an average credit quality of approximately ‘A’ to ‘A-‘, which we believe is representative of fixed annuity market pricing and investing practices and is therefore an appropriate level for principle-based reserving.

2. Index Credit Hedging Treatment

We agree that modeling hedge breakage seems reasonable and appropriate. The index credit hedge breakage simplification seems like a potentially reasonable option for those that do not model their hedge program explicitly or manage market risks from their products more holistically; we believe it should be an optional simplification and not a requirement. We believe, however, that the proposed 1% floor factor can be too low in some instances. Static and dynamic hedges should
have different breakage expenses as dynamic hedges should have a higher minimum breakage expense given the inherent uncertainty of hedge income actually realized. For static hedging strategies, whereby the replicating portfolio of financial instruments is purchased at the index segment inception, a 1% floor on the hedge cost expressed as a percentage of the interest credited might be reasonable (but should be tested to determine whether another level is more appropriate). However, for dynamic hedging strategies that do not lock in the index crediting amount at segment inception, a 1% floor is likely too low. Depending on the strategy, we believe a floor approaching the 5% floor within VM-21 would be appropriate, as such strategies show more hedge ineffectiveness during periods of market stress than static hedge programs.

Additionally, we believe that there should be more discussion on the treatment of reflecting management actions in the reserve, such as index credits, caps, and management of hedge gains and losses and defaults.

3. Aggregation

Aggregation should be primarily driven by how assets are managed, since that is how the company views risk/return trade-offs. Companies already aggregate for other purposes including C3P1 and asset adequacy; the economic scenario that actually materializes will be the same for all business, and it would not make sense to calculate results separately and hold reserves for a product assuming rates spike and reserves for another product assuming that the same rates simultaneously decrease. Deviating from the level assets are managed would require arbitrary and/or complex asset allocations across blocks of business that could distort reserves, even if the allocation method is consistent over time. Concerns about shorter duration / less risky cash flows running off seem like a reserve pattern issue (rather than what is currently appropriate) that would be better addressed in the ORSA. Alternately, there could be an aggregation benefit disclosure.

4. Exclusion Testing

We support the inclusion of an exclusion test in VM-22, as well as a materiality threshold similar to the Life PBR Exemption. We believe that exclusion testing thresholds should be set based on the risks and field test results, rather than by a priori views about what should or should not pass. We do not believe longevity risk should be included in the ratio test for all products; rather, the test should limit its focus on ALM mismatch risk. Products with well-matched portfolios and only longevity risk do not necessarily need to be tested stochastically and should be able to pass the exclusion tests. Longevity risk can then be handled through the margins embedded in prescribed mortality assumptions. Alternatively, we support including a deterministic reserve option to handle payout contracts with longevity risk, similar to that described in the appendix of the exposure.

If there are products that regulators believe should always pass any exclusion test, regulators should consider if these products should be out of scope for VM-22. Where appropriate, it may be worth considering whether exclusion testing requirements could be simplified or potentially removed for certain products that regulators expect to pass to reduce the extra work of doing both an exclusion test and creating the required PBR documentation for these products (or as previously suggested something akin to the VM-20 Life PBR Exemption). This product-specific
guidance could also be addressed within VM-22 (for example, if FIAs without withdrawal benefits fall back on AG35, consider making the Iowa practice for indexed products part of VM-22).

5. Allocation Methodology

We believe there should be flexibility around allocation, so long as it supports an acceptable tax reserve. We do not believe VM-22 allocation needs to be more prescriptive than VM-21. VM-22 should allow for company discretion to develop an allocation method consistent with VM-21. For example, for many products using NAR (value of benefits above CSV) would generally produce a similar result as the proposed methodology, without requiring additional complexity/runs. We also note that tracking GPVAD on a seriatim basis is extremely complex and functionally impossible for companies who use crunched/cluster models.

6. Scope

ACLI believes that whether a product falls under VM-21 or VM-22 should depend on the nature of the risk. Based on the nature of the risk, we believe that hybrid annuities and many structured annuity designs would be covered by VM-21. Further, we believe that funded and unfunded longevity reinsurance should fall within the scope of the existing VM-22. Finally, several categories from the existing VM-22 Scope section are not included in the slides (e.g., Supplementary Contracts, CDA’s); we would like to understand if certain products were deliberately excluded at this time from the potential regulatory framework.

7. Timeline

Target effective dates will need to be reconsidered if inforce business is included in VM-22 on either an optional or mandatory basis. The timeline should consider a later effective date for inforce than new business, alignment with C-3 Phase 1, and other considerations. Companies have a wide variety of systems and VM-20 and VM-21 processes do not necessarily support VM-22 required processes, so it is likely to require a very large build. A scope limited to new business would simplify the build because it would reflect the much smaller universe of products currently being developed and offered.

8. Discount Rates and Starting Assets

We believe there should be alignment of discount rates and starting assets to the VM-21 methodology. We recommend revisiting borrowing cost restrictions (e.g., to avoid anomalies and/or be more principles-based) and aligning the approach across all products. During VM-21 development, regulators deliberately aligned asset requirements with VM-20, but ultimately the framework deviated from this and added the borrowing cost restriction to VM-21. The NAIC staff letter from the VA subgroup work and a VM-21 guidance note flagged this for future LATF review for all products.

9. Mortality
We believe mortality should follow a principles-based approach consistent with VM-21 rather than the more prescriptive approach in VM-20. We believe it is appropriate for consistency of alignment between annuity products. Mortality curves in the “no data” case or for credibility weighting and mortality improvement should reflect appropriate experience / assumptions – including product differences, appropriate granularity, geographic / country differences, etc. It would be inappropriate to merely rely on VA mortality, and rather should consider updated SOA reports and studies (e.g., upcoming fixed deferred, individual payout, group payout, etc.).

10. VM-31 Disclosures

We have the following comments on the disclosure recommendations:

- General Account Assets: A full reserve calculation may not be necessary. Appropriately documented simplifications that demonstrate why the reinvestment restrictions are more conservative should still be allowed (e.g., similar to VM-20, Section 2.G) if it is clear the reinvestment restriction will dominate instead of requiring 2 runs.
- Hedging: It is not clear whether the full contract fair value comparison is useful for VA, and it seems potentially even less useful for fixed annuities (e.g., for a plain vanilla FIA with hedged index credits).
- Dynamic Policyholder Behavior: This requirement seems redundant with existing requirements to provide rationales for assumptions and could perhaps be addressed with a guidance note.

We appreciate the consideration of our comments, and look forward to discussing on a future call. Thank you.

Sincerely,

[Signature]

cc: Reggie Mazyck, NAIC
DATE: December 14, 2020

TO: Bruce Sartain, Chair, NAIC VM-22 (A) Subgroup

FROM: Aaron Sarfatti, Chief Risk Officer; Steve Tizzoni, Head of Actuarial Regulatory Affairs

SUBJECT: Equitable Comments on Fixed Annuity Principles Based Reserve (PBR) Proposal

Equitable appreciates the opportunity to comment on the Academy Annuity Reserve Working Group’s (ARWG) proposed Fixed Annuity PBR framework. Below are our views on two key aspects of the framework: (1) reinvestment mix; and (2) aggregation of reserves. The remainder of our views are appropriately captured in the ACLI comment letter.

Reinvestment Mix:
The VM-22 subgroup requested feedback on the reinvestment mix used in the fixed annuity PBR framework. The ARWG recommends use of reinvestment assumptions that are in line with VM-20 and VM-21 but proposes using a reinvestment mix of 5% Treasury, 15% AA, 40% A, and 40% BBB instead of the current 50%/50% blend of A/AA corporate bonds used in VM-20/21.

Equitable believes credit spread limits for both reinvestment and existing investments are central guardrails to assure the integrity of principle-based reserving. Aggregate or portfolio wide credit spread caps are necessary to ensure the asset portfolio reserve aligns with market pricing for interest-sensitive liabilities and hence ensures balance sheet resilience. Individual security credit spread caps ensure individual assets at high risk of impairment reflect appropriate default loss expectations, although may not be necessary in the presence of prudent portfolio-wide spread caps.

Equitable supports the use of a VM-22 credit quality mix as the aggregate credit spread cap for reinvestment assets as proposed by the ARWG. The VM-22 spread reflects an average credit quality of approximately ‘A’ to ‘A-’, which we believe is representative of fixed annuity market pricing and investing practices and is therefore an appropriate level for principle-based reserving.

In addition to applying the VM-22 based credit spread cap to reinvestment assets, Equitable supports application of such a cap to existing assets. Such a limit would ensure reserves do not rely on excessive amounts of credit spread in excess of industry investment and pricing practices. A credit spread cap applied at the individual security level could also be considered to ensure appropriate default loss expectations are used for assets at high risk of impairment. We think an appropriate level for such a cap would be the lower limit of investment grade credit, approximately BBB.

In addition to extending the scope of credit spread caps within the VM-22 framework, Equitable believes the ARWG should consider shortening the proposed four-year period over which current credit spreads grade to long term spreads to no longer than one year. In practice, we see credit spreads reverting to long term averages significantly faster than four years. In the event of elevated credits, such as in the 2008-2009 financial crisis or the 2020 COVID-19 crisis, we do not believe reserves should reflect benefits of historically wide spreads on assets that the company does not yet own. It is reasonable for reserves to
reflect a benefit from such elevated spreads once the assets are purchased and on the company’s balance sheet.

As an example, consider the March 2020 valuation date. Spreads were extremely elevated at that time, and, under a four-year grading construct, a company would be required to reflect elevated spreads in its reinvestments for the next three years -- a significant reserve benefit as of March 2020. Instead, over the next few months, spreads quickly compressed towards the long-term average, and by June 2020, most of the reserve reduction from elevated spreads at the March 2020 valuation date had reversed without any offsetting benefit to asset book values. This example illustrates why Equitable supports a shorter time horizon for grading to occur (no more than 1 year).

The graph below shows the Barclay’s A-rated corporate bond spreads over the past 14 years. The chart demonstrates the swift mean reversion of spreads towards the 10-year moving average corporate spread following each peak. We quantified this pattern by looking at the time for spreads to revert 75% of the way back to the 10yr moving average following each peak in spreads and in each case found that 75% mean reversion occurred within 1 calendar year.

![Graph showing single A corporate bond spreads and 10yr moving average](image)

**Aggregation of Reserves:**
The ARWG proposal allows aggregation of reserves if certain aggregation principles are met (i.e. aggregating policies that have similar risk management strategies, disallowing aggregation for policies that are administered or managed separately, etc.).

Equitable broadly supports the concept of aggregation in reserving, as the aggregation of risk is at the core of the insurance industry. The key risk of including aggregation within reserving is the risk that the projected profits on profitable contracts/product lines are not realized over time and therefore are not available to supplement reserves for in-the-money contracts/product lines. As such, the risk of aggregation equates to the risk that economic and policyholder behavior assumptions on profitable product lines are not realized.
Equitable believes the present governance over aggregation, principally through denying aggregation across major liability types, does not align with the ultimate concern about actuarial risk and is at best a crude guardrail. Equitable recommends a two-fold governance mechanism consisting of:

a) Governance over assumptions via mechanisms such as the Standard Projection Amount
b) Disclosure of total aggregation benefits utilized in VM-22 PBR report

Equitable believes this tandem is the best way to govern policyholder behavior risk because it (a) directly guards key assumptions for both positive reserve (“in-the-money”) and profitable/negative reserve (“out-of-the-money”) business and (b) alerts regulators to situations where company capital may not be sufficient to withstand material deviations from the failure to realize projected profits.

**Conclusion:**
Equitable appreciates the opportunity to comment on the ARWG’s VM-22 proposal and we look forward to working with the ARWG and regulators to develop an appropriate principle based reserving framework for fixed annuities. We are available to discuss our comments further as desired.

Sincerely,

Aaron Sarfatti, Chief Risk Officer

Stephen Tizzoni, Head of Actuarial Regulatory Affairs
Future Mortality Improvement Recommendation (VM20)

MORTALITY IMPROVEMENTS LIFE WORKING GROUP (MILWG) OF THE ACADEMY LIFE EXPERIENCE COMMITTEE AND SOA PREFERRED MORTALITY PROJECT OVERSIGHT GROUP (“JOINT COMMITTEE”)

Individual Life Insurance
Future Mortality Improvement for VM20 Products

GOAL: To allow a prudent level of future mortality improvement (FMI) for VM20 products beginning with the 2022 valuation manual

- FMI scale will be developed, updated and made available to practitioners annually
- Updates will be limited to a threshold of materiality for making a change
- Two versions of the scale will be published: Basic and Loaded
- Period of scale application: 20 years
Recommended FMI Scale Methodology:
Modification of Consistent Framework for MI Scale Development

**Historical Basis**
- Annual AG 38/VM 20 MI scale adopted annually
- Best estimate of recent historical MI

**Transition Period**
- Grade from historical basis to a long-term MI rate ("LTMIR") at 10 years
- MI will remain level to 15 years
- Grade to no improvement at 20 years
- Linear interpolation for grading

**Long-term MI rates ("LTMIR")**
- "LTMIR" defined as average of projection years 10-15 from SSA intermediate projection ("Alt 2")

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**Recommendation: Consistent Framework Approach**
**Simplified Method**

<table>
<thead>
<tr>
<th>Valuation Date</th>
<th>10 years</th>
<th>15 years</th>
<th>20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transition Period</td>
<td>Long-term MI rate (LTMIR)</td>
<td>Transition Period</td>
</tr>
<tr>
<td>LTMMIR will vary by age only</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starting level:
VM20/AG38 MI Rates

Vary by sex and age

or

MI = 0
Loading/Margin Considerations

- **MARGIN ON THE INCREMENTAL MORTALITY IMPROVEMENT SCALE**
  - Simplified method represents our “best estimate”
  - Margin will be included for all companies
    - Companies may use a more conservative MI but not less conservative
  - Margin will take the form of a flat % reduction in the best estimate MI scale
    - Current thinking is between one-quarter and one-third reduction in MI levels
  - There will be a discontinuity in the starting rates for FMI and those used up to the valuation date representing the application of the margin

- **OPTIONS DISCUSSED:**
  - Greater volatility in recent historical data and for certain age groups

Items for Discussion in Phase 2

- **SHORTER TERM ISSUES**
  - Consideration of COVID-19 impacts when we reach 2020 data inclusion
    - Shock
    - Potential longer term impacts
  - Impacts of opioid epidemic
  - Threshold of materiality for making a change in a given year
  - Socioeconomic differences (between general and insured population)

- **LONGER TERM ISSUES**
  - Consideration of cohort effects
Next Steps

- Amendment Proposal Form /methodology approval
- Implement smoothing process
- Finalize margin levels
- Develop best estimate and loaded scales for 2022 implementation

Contact Information

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Khloe Greenwood
Life Policy Analyst
American Academy of Actuaries
greenwood@actuary.org
Life Actuarial (A) Task Force
Amendment Proposal Form 2020-10
Exposed for a 45-day public comment period ending May 25, 2021

Request for Comment: During the exposure, commenters are specifically asked to address whether the “may” in 9.C.7.f, as well as 9.C.3.g, should be changed to “shall”. That is, rather than the SOA rates for historical and future mortality improvement being optional, they are required. However, if historical or future mortality improvement were overall positive and so not applying it would be conservative, then that would still be permissible as a simplification, since VM-20 Section 2.G would still apply here. Thus, the difference between “may” and “shall” would arise if historical or future mortality improvement were ever overall negative and so not applying it would be less conservative and so not permissible.

Please submit comments to Reggie Mazyck (RMazyck@naic.org) by COB 5/25/21.
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.


Reflect a prudent level of mortality improvement beyond the valuation date.

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:


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 Appendix.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

The current Valuation Manual requirements are beyond moderately adverse with regard to future mortality improvement when significant future mortality improvement is expected. The requirements also need to be clarified for the handling of historical or anticipated future mortality deterioration (i.e., negative improvement). We propose to reflect a prudent level of mortality improvement beyond the valuation date, using SOA analysis for best estimate future mortality improvement and margin.

With the reflection of a prudent level of future mortality improvement in the mortality assumption, the interim 1/2cx approach to YRT is a reasonable consideration for a long-term approach.
Appendix

VM-20 Section 6.A.2.b.v:

v. Mortality improvement beyond the projection start date, other than that outlined in VM-20 Section 9.C.7.f, may not be reflected in the mortality assumption for the purpose of calculating the stochastic exclusion ratio.

VM-20 Section 8.C, introductory paragraph:

C. Reflection of Reinsurance Cash Flows in the Deterministic Reserve or Stochastic Reserve

For non-guaranteed YRT reinsurance ceded or assumed, the cash-flow modeling requirements in Sections 8.C.1 through 8.C.14 below do not apply since non-guaranteed YRT reinsurance ceded or assumed does not need to be modeled; see Section 8.C.18 below. YRT shall include other reinsurance arrangements that are similar in effect to YRT.

VM-20 Section 8.C.18 and Guidance Note:

18. When the reinsurance ceded or assumed is on a non-guaranteed YRT or similar basis, the corresponding reinsurance cash flows do not need to be modeled. Rather, for a ceding company, the post-reinsurance-ceded DR or SR shall be the pre-reinsurance-ceded DR or SR pursuant to Section 8.D.2, plus any applicable provision pursuant to Section 8.C.15 and Section 8.C.17, minus the NPR reinsurance credit from Section 8.B. For an assuming company, the DR or SR for the business assumed on a non-guaranteed YRT or similar basis shall be set equal to the NPR from Section 3.B.8, plus any applicable provision pursuant to Section 8.C.16 and Section 8.C.17. In the case where there are also other reinsurance arrangements that are not on a non-guaranteed YRT or similar basis, the reinsurance credit shall include the modeled reinsurance credit reflecting those other reinsurance arrangements. In particular, where there are also other reinsurance arrangements that are dependent on the non-guaranteed YRT or similar actuarial judgment shall be used to project cash flows consistent with the above outlined treatment for non-guaranteed YRT or similar arrangements.

VM-20 Section 9.C.2.h:

h. Mortality improvement shall not be incorporated beyond the valuation date in the company experience mortality rates. However, historical mortality improvement from the central point of the underlying company experience data to the valuation date may be incorporated.

Guidance Note: Future mortality improvement is not applied to the company experience mortality rates, since it would be duplicative of the future mortality improvement that is applied to the prudent estimate assumptions for mortality in Section 9.C.7.f.

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VM-20 Section 9.C.3.g:

g. Mortality improvement shall not be incorporated beyond the valuation date in the industry basic table. However, historical mortality improvement from the date of the industry basic table (e.g., Jan. 1, 2008, for the 2008 VBT and July 1, 2015, for the 2015 VBT) to the valuation date may be incorporated using the improvement factors for the applicable industry basic table as determined by the SOA, adopted by LATF, and published on the SOA website, https://www.soa.org/research/topics/indiv-val-exp-study-list/ (Mortality Improvement Rates for AG-38 for Year-End YYYY).

**Guidance Note:** Future mortality improvement is not applied to the industry basic table, since it would be duplicative of the future mortality improvement that is applied to the prudent estimate assumptions for mortality in Section 9.C.7.f.

To allow time for companies to reflect the updated mortality improvement rates, the rates that are to be used in the year-end YYYY valuation should be adopted by LATF and published on the SOA website by September of YYYY. If this timeline is not met, then at the company’s option they may use the most recent set of prior mortality improvement rates adopted by LATF and published on the SOA website.

VM-20 Section 9.C.7.f (new section):

The prudent estimate assumptions for mortality may be adjusted to reflect up to 20 years of future mortality improvement that the company expects beyond the valuation date, using prudent future mortality improvement factors no greater than the loaded factors determined by the SOA, adopted by LATF, and published on the SOA website, at [link/reference to SOA site TBD].

**Guidance Note:** Mortality improvement may be positive or negative (i.e., deterioration).

To allow time for companies to reflect the updated mortality improvement rates, the rates that are to be used in the year-end YYYY valuation should be adopted by LATF and published on the SOA website by September of YYYY. If this timeline is not met, then at the company’s option they may use the mortality improvement rates for the prior year (year YYYY-1).

VM-31 Section 3.D.3.i:

i. **Adjustments for Mortality Improvement** – Description of and rationale for any adjustments to the mortality assumptions for mortality improvement up to and beyond the valuation date. Such a description shall include the assumed start and end dates of the improvements and a table of the annual improvement percentage(s) used, both without and with margin, separately for company experience and the industry basic table(s), along with a sample calculation of the adjustment (e.g., for a male preferred nonsmoker age 45).

VM-31 Section 3.D.11.c.i:

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i. If the company believes the method used to determine anticipated experience mortality assumptions includes an implicit margin, the company can adjust the anticipated experience assumptions to remove this implicit margin for this reporting purpose only. If any such adjustment is made, the company shall document the rationale and method used to determine the anticipated experience assumption.

Deleted: For example, to the extent the company expects mortality improvement after the valuation date, any such mortality improvement is an implicit margin and, therefore, is an acceptable adjustment to the anticipated experience assumptions.
Statement on Level of Documentation, Conning Intellectual Property:

The Task Force received several comment letters with respect to full documentation of the NAIC Economic Scenario Generator specifications, calibration and tools. For example, the American Academy of Actuaries Economic Scenario Generator Work Group in their comments stated that many key elements of full ESG documentation are missing, and that achieving full documentation is important to understanding whether the ESG is fit for use in principle-based reserve and capital calculations. In their comment letter the Academy referred to ASOP 56, which provides that “when selecting, reviewing or evaluating the model, the actuary should confirm that in the actuary’s professional judgment the model reasonably meets the intended purpose.” We will not be getting into an extended discussion of ASOP 56, but we note that the intended purpose for the NAIC ESG is to help set reserves and capital as “prescribed by applicable law”. LATF considered the issue of whether to permit insurers to use other proprietary ESGs in meeting their statutory reserve and capital requirements, and it was ultimately determined that we would continue with our current format of a prescribed ESG for use under the Valuation Manual. This will better produce uniform results that can be relied upon by states in regulating these companies. In essence, the prescribed ESG developed by the Academy and currently required under the Valuation Manual would be replaced by an ESG prescribed under law that we are developing with Conning.

In our opinion, Conning has been very forthcoming with various requests with respect to documentation, and we are continuing to work with Conning to develop documentation that would prove satisfactory to everyone. However, there is a limit under which we can expect Conning to supply documentation. Under the NAIC’s Professional Services Agreement with Conning, Inc., Conning retains ownership of its Intellectual Property, including its software and source codes. The Task Force understands that there is a limit to which Conning will share certain information, and that their ESG is proprietary. The NAIC remains committed to providing a prescribed ESG for our regulated companies that best reflects the potential future economic environments our companies could be exposed to, but we also want to respect the proprietary rights of our vendors. Monthly scenario files produced by the new ESG will remain free to use by the companies, and we are not adding increased regulatory costs. The Task Force remains fully committed to developing the best ESG for regulatory purposes, and we ask for everyone’s patience and reasonableness in helping us achieve this goal. The Task Force continues to believe that Conning is best situated to this task, which is why we retained them as our vendor.

Mike Boerner, ASA, MAAA
Chair of the Life Actuarial (A) Task Force (LATF)
NAIC ESG Comments: Common Themes

Pat Allison, FSA, MAAA – NAIC Managing Life Actuary
Scott O’Neal, FSA, MAAA – NAIC Life Examination Actuary
Dan Finn, FCAS, ASA – Managing Director at Conning

Agenda

1. Discuss Common Themes Present in the ESG Comment Letters Received by the NAIC
   a. Level of Negative Treasury Yields
   b. Corporate Model Complexity
   c. Extreme Equity Returns
   d. Inversion Frequencies
   e. Equity Model Link to Treasuries
   f. International Returns
   g. Timeline
   h. Data Format
   i. Projection Period
   j. Documentation

2. Open Discussion on Comments not Covered in Common Themes
Level of Negative Treasury Yields

Commentary:
- “The [initial] exposed scenario set, which is as of 12/31/19, has interest rates as low as -4.8%, which seems quite extreme. The likelihood and magnitude of negative interest rates produced by the model may be even more extreme when calibrated to more recent market conditions” - American Academy of Actuaries
- “…we believe that the projected frequency and severity of negative rates should be similar to historical US experience and not be unduly influenced by experience in other economies outside the US. Historically, no period of negative rates in the US has lasted for a meaningful period of time.” – ACLI
- “Equitable believes that the recent European experience with negative rates is a reasonable benchmark to establish a lower bound on negative rates.” - Equitable

Response:
- Regulators and Conning will develop targets to control the level of negative treasury Yields
  - Likely target steady state distribution
  - May take several forms (e.g. x% below 0%, target skew)
  - Likely will NOT target short-term results: too heavily impacted by initial conditions
  - Likely will NOT target absolute minimum: too subject to sample variation

Corporate Model Complexity

Commentary:
- “Conceptually, we support the goals to have stochastic spreads, credit migration, granular credit modeling, and consistency between basic and robust data sets. However, we have several concerns:”
  - We lack sufficient documentation on GEMS’ underlying credit model, assumptions, or existing calibration.
  - …discrepancies between prescribed general account credit assumptions … and … credit scenarios.
  - “…tradeoff of a more sophisticated model …relative to the increased complexity…” - ACLI
  - “Until we have complete documentation of the credit model, the ESGWG suggests revisiting whether a simpler approach to simulating bond fund returns (not requiring a credit model) would be more appropriate.” – American Academy of Actuaries

Response:
- Regulator Decision: Should the more complex current credit model be used, or a simpler model be developed?
- Benefits of GEMS Corporate Model:
  - Better captures nature of these investments
  - Does not involve any additional build out
  - Links Basic and Robust Data Sets
  - Will require substantial additional documentation on this model – currently in development
Extreme Equity Returns

Commentary:
- “Equity returns appear to be explosive in the upside and downside tails.” – Prudential
- “Equity indices lose all value in some scenarios while increasing hundreds of times in others.” – American Academy of Actuaries
- “We would like a better understanding of jump process /parameters & comparison of returns after jumps vs. history (which includes strong market recovery in a relatively short time period after jump down). The S&P 500 (price index) has negative returns over 30 years in 12% of scenarios even though this has never been observed in history.” – ACLI

Response:
- Regulator Decision: Do regulators want to alter the targets for the mean and standard deviation of the Equity model to limit the extremity of the tail scenarios?
- Extreme returns are almost entirely driven by the expected mean and standard deviation of the annual returns for each index

Inversion Frequencies

Commentary:
- “…inversions [in the 12/31/19 Revised Baseline] for short maturities are still relatively frequent (~25% of scenarios). The frequency of short rate inversions also worsens dramatically in the first five years of the 12/31/2020 [Revised Baseline] scenarios.” – ACLI
- “While the revised scenarios are significantly improved vs. the original scenarios in this regard, the amount of yield curve inversions is still above what one would expect based on historical experience. Equitable encourages further discussion between industry and regulators on this topic.” – Equitable
- “Two features of these scenarios we consider troublesome are the magnitude of negative interest rates and the shape and frequency of yield curve inversion.” – Pedersen/Tenney

Response:
- Unlikely to specifically target inversion frequencies, however, the number of inversions will be reviewed in the scenario output for reasonableness
- Inversion frequencies are tightly linked to the average term premium - which is being targeted

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Average 20 Yr – 1 Yr</th>
<th>Inversion Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Years</td>
<td>2.3%</td>
<td>1.25%</td>
</tr>
<tr>
<td>40 Years</td>
<td>2.0%</td>
<td>3.75%</td>
</tr>
<tr>
<td>60 Years</td>
<td>1.5%</td>
<td>13.19%</td>
</tr>
<tr>
<td>80 Years</td>
<td>1.4%</td>
<td>11.25%</td>
</tr>
</tbody>
</table>
Equity Model Link to Treasuries

**Commentary:**
- “We do not support the formulaic linkage ... given the lack of historical evidence.” – ACLI
- “Equitable supports the structural linkage between interest rates and equity returns via an equity risk premium as utilized in the exposed GEMS scenarios... We would invite the consideration of expressing equity returns as a function of longer-term interest rates ... as that could help stabilize equity returns from calibration to calibration.” – Equitable
- “The ESWG believes it is important to understand this connection that was not in the old model, and to consider the impact the connection has on reserve and capital levels and whether calibration standards may need adjustment in level and/or form as a result.” – American Academy of Actuaries

**Response:**
- GEMS links expected equity return to current short Treasury Yield. The AIRG model does not have a link between these models
- **Regulator Decision:** Should there be a link between the Treasury and Equity models in the new ESG?

International Returns

**Commentary:**
- “The model returns should be calibrated similarly to the AIRG, with the addition of recent history. In particular, low EAFE returns and higher SPX/EAFE correlations may be contributing to inconsistencies in the risk return relationship between different equity indices.” – ACLI
- “The exposed scenarios set international dividend yields to zero even though EAFE dividends have historically been non-zero.” – Prudential
- “EAFE index returns meaningfully below US returns on a risk-adjusted basis” – Equitable

**Response:**
- **Regulator Decision:** Should International Diversified Equity returns align with history or risk/return framework?
- Exposed scenarios only have Total Return
  - Conning is developing a revised specification
  - Expect to release shortly
- For the past 30+ years, International Diversified Equity returns have underperformed
  - About 2% below Large Cap per year with slightly higher volatility
International Returns

**Historical Risk vs Reward**
Monthly Data from Dec 1987 through Dec 2020

- S&P 500
- Russell 2000
- MSCI EM
- MSCI EAFE

**Timeline**

**Commentary:**
- “The ESGWG believes the implementation timeline does not leave enough time for regulators and interested parties to:
  - (a) Review the totality of exposed documentation and adequately understand the newly proposed ESG...
  - (b) Discuss the properties that scenario sets used for reserves/capital should have...
  - Iterate to desirable field-testing options based on (a) and (b).
  - Conduct a field test, allowing time for additional/iterative testing...” – American Academy of Actuaries
- While ACLI recognizes the need to get a better generator in place as soon as possible, our observations to date do not give us comfort in the current state of the proposed model which may indicate timeline issues.” – ACLI

**Response:**
- The NAIC’s current plan is to continue with the existing timeline, however, adjustments will be made to the timeline if necessary to ensure regulators and interested parties can properly evaluate the new ESG.
Data Format

Commentary:
- “For use in companies’ existing models, the ESWG suggests publishing scenario sets in two alternative .CSV file formats: (A) GEMS .CSV file format, which is currently exposed, and (B) the Academy Interest Rate Generator (AIRG) multiple .CSV file format.” - American Academy of Actuaries
- “The prescribed generator must automatically output prescribed scenarios in a common electronic format.” – ACLI
- “…it may be helpful to have scenarios available in the current format, as suggested, but it is also helpful to the additional indices and data points available for the “full Conning format”” – Link Richardson

Response:
- Conning can easily adjust this to meet industry’s needs
- Specifically looking for feedback on a single desired format – Questions Include:
  - All Yield Curve points or only selected?
  - Spot Rates and Coupon Curves?
  - Income and price or just total returns?
  - Incremental Returns or Wealth Factors?
  - One big file or separate files by column?
  - Months as rows or columns?

Projection Period

Commentary:
- “The ESWG also notes the current AIRG can produce scenario sets with projection lengths up to 100 years to support insurance products with very long durations, e.g., SPIAs and some life insurance products. Therefore... actuaries will need similarly long projection lengths out of the new ESG.” - American Academy of Actuaries
- “[Scenarios with longer projection periods] would be very helpful in allowing people to start running models with these scenarios.” – Link Richardson
- “Would it be possible for scenarios with 90 years of returns to be provided?” – Scott Schneider

Response:
- NAIC recommends a projection period of 100 years
Documentation

Commentary:

- "...full documentation of the model ... enables actuaries to adequately understand the dynamics of the model and objectively evaluate whether the scenario sets it produces are fit for purpose ... as required of actuaries by ASOP No. 56, Modeling, and ASOP No. 41, Actuarial Communications..." - American Academy of Actuaries
- "...we request more thorough and comprehensive documentation which will aid in understanding of the model and make the decisioning and testing process more efficient." - ACLI
- "Regulators and interested parties must have sufficient information to discuss and understand the proposed interest rate, equity, credit spread / default models; any interrelationships / dependencies; and their calibration..." - Prudential
- "we respectfully submit that it [full documentation] should mean that sufficient details are provided so that a determined risk management professional is able to fully understand the model dynamics and be able to approximately reproduce the model output and calibration parameters ..." - Pedersen/Tenney
- Continue expanding documentation: Recommend additional documentation as delineated in ACLI comment letter - Equitable

Response:

- The NAIC and Conning are committed to releasing an appropriate level of documentation to facilitate an understanding of the new ESG while recognizing Conning’s intellectual property rights.

Open Discussion on Comments Not Covered in Common Themes
March 24, 2021

Mr. Mike Boerner  
Chair, Life Actuarial (A) Task Force (LATF)  
National Association of Insurance Commissioners (NAIC)

Dear Mr. Boerner,

The American Academy of Actuaries’ Economic Scenario Generator Work Group (the “ESGWG”) appreciates the opportunity to offer comments on LATF’s Economic Scenario Generator (ESG) exposures.

1. Proprietary ESGs  
As a general point, the ESGWG would like to reiterate the view previously communicated by Academy Life Practice Council work groups that the use of scenario sets generated by proprietary ESGs be permitted as an alternative option to scenario sets prescribed by the NAIC, subject to proper documentation on how the scenario sets were developed and why they are appropriate for statutory reserves and capital.

2. Full ESG Documentation  
Deliverable I of NAIC RFP #2053 is “Full documentation on the ESG specifications, calibration, and tools.” The ESGWG would like to reiterate the importance of this deliverable because it is full documentation of the model that enables actuaries to adequately understand the dynamics of the model and objectively evaluate whether the scenario sets it produces are fit for purpose (adequate for determining reserves and capital, irrespective of the starting yield curve) as required of actuaries by Actuarial Standard of Practice (ASOP) No. 56, Modeling, and ASOP No. 41, Actuarial Communications.

a. ASOP No. 56, Modeling, provides guidance to actuaries when performing actuarial services with respect to using, reviewing, or evaluating models. Section 3.1.2 of ASOP No. 56 states actuaries “evaluating the model … should confirm that, in the actuary’s professional judgment, the model reasonably meets the intended purpose.” Section 3.1.3 of ASOP No. 56 states that “[w]hen using the model, the actuary should make reasonable efforts to confirm that the model structure, data, assumptions, governance and controls, and model testing and output validation are consistent with the intended purpose.”

1 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.
b. Section 3.2 of ASOP No. 41, *Actuarial Communications*, states “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.”

Although several pieces of ESG documentation have been exposed by LATF, the ESGWG believes that many key elements of full ESG documentation are missing. Furthermore the ESGWG believes that achieving full documentation relies on the critical project path of adequately understanding how the ESG will perform under different conditions and assessing whether scenario sets produced by the ESG are fit for use in principle-based reserve and capital calculations. The ESGWG also believes that a lack of sufficient documentation could unintentionally impact the ESG quantity and quality of these important risk management tools available to the life insurance industry. Additional detail can be found in *Exhibit 2.1—ESG Documentation*, but as a starting point, here are two specific pieces of documentation that, as yet, have not been publicly provided:

- The exact means by which the ESG model is adjusted to fit any discrepancies to the starting yield curve, and exactly how those discrepancies run off over the course of the projection (the entire yield curve, not just the three points corresponding to the model’s three state variables).
- The correlations between the various equity and bond funds.

3. **Significant Differences FromPreviously Prescribed ESG**

The ESGWG does not believe the newly proposed ESG needs to be substantially similar to the Academy’s Interest Rate Generator (AIRG). Indeed, the proposed ESG is not. But the ESGWG does believe it is important that regulators and interested parties appreciate just how different the two models are (in both underlying structure and calibration), generally agree that the differences are warranted, and understand the impact the differences will have on the scenario sets produced and the level and volatility of industry reserve and capital levels, including how model dynamics and interrelationships will change in the long term as the current economic environment changes. This will take time and additional documentation, but to start with, the ESGWG would like to highlight the following three significant differences:

a. **Lack of explicit MRP**—The old model has an explicit and intuitive mean-reversion parameter (MRP) that changes rather slowly according to a specified formula. The new model has no analogous MRP for regulators to explicitly set or control. Instead, NAIC’s vendor, Conning, has agreed to target an MRP by tweaking various parameters during calibration, but as seen in the revised baseline scenario set, this can have unintended consequences given the various linkages in the model. And it remains to be seen how sensitive mean reversion is to the current economic environment—e.g., to the observed yield curve on the valuation date. The ESGWG believes it is important to understand this significant change in the mean-reversion process and resulting impact on the volatility of capital over time.

b. **Connection Between Interest Rates and Equity Returns**—The old model has no such connection. The simple formulaic connection in the new model (equity risk premium over short Treasury rate) is largely based on actuarial judgment and the goal that the model produces risk-neutral scenarios. Empirical evidence suggests the equity risk premium depends on non-modeled macroeconomic factors (historical correlations have been both highly negative and highly

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2 This exhibit and subsequent exhibits cited are included in the enclosure to this comment letter.
positive). This has the potential to magnify the tails because calibration points in the new model depend on the starting yield curve in a way that they did not in the past. It also has the potential to make long-duration insurance liabilities dependent on overnight Treasury rates, which seems artificial and counterintuitive. The ESWG believes it is important to understand this connection that was not in the old model, and to consider the impact the connection has on reserve and capital levels and whether calibration standards may need adjustment in level and/or form as a result.

c. **Stochastic Modeling of Credit Spreads and Defaults for Bond Fund Returns**—The new ESG simulates bond fund returns by first using a credit model to simulate each of the individual bonds contained in the bond fund; e.g., using stochastic credit spreads, transitions, and defaults. The old ESG uses a simpler approach that does not involve a credit model. To date, the ESGWG simply does not have enough documentation on the new credit model to comment further on the impact this significant change may have and whether it is desirable or not. Until we have complete documentation of the credit model, the ESGWG suggests revisiting whether a simpler approach to simulating bond fund returns (not requiring a credit model) would be more appropriate. Regulators may also wish to consider the degree to which the approach for simulating bond fund returns is consistent with the regulatory framework for modeling insurer general account assets, which requires using deterministic prescribed credit spreads and defaults and could easily lead to calibration inconsistencies.

4. **Implementation Timeline**

The ESGWG believes the implementation timeline does not leave enough time for regulators and interested parties to:

a. Review the totality of exposed documentation and adequately understand the newly proposed ESG model and the scenarios it would produce under various initial conditions.

b. Discuss the properties that scenario sets used for reserves/capital should have and evaluate the new ESG and its scenario sets on that basis.

c. Iterate to desirable field-testing options based on (a) and (b).

d. Conduct a field test, allowing time for additional/iterative testing (given the likelihood there will be adjustments based on what is learned from prior iterations of testing).

The ESGWG also believes that approval in November/December could present companies and vendors with an insufficient short timeframe to implement the final ESG in their systems.

5. **Scenario Sets – Rates**

Although the ESGWG may have additional comments as additional missing documentation is exposed, the ESGWG’s initial comments on the baseline scenario set (exposed 12/18/20) can be found in Exhibit 5.1: Scenario Sets—Rates. Key issues include the following:

a. The exposed scenario set, which is as of 12/31/19, has interest rates as low as -4.8%, which seems quite extreme. The likelihood and magnitude of negative interest rates produced by the model may be even more extreme when calibrated to more recent market conditions.

b. A comparison of risk-neutral and real-world calibrations implies a negative market price of risk for long-term interest rates.

c. Equity indices lose all value in some scenarios while increasing hundreds of times in others.

d. Unreasonable short-end inversions. In nearly all scenarios, the yield curve is inverted between 1-month and 2-year rates (fixed in the revised baseline scenario set).

The ESGWG also reviewed the revised baseline scenario set (exposed 2/24/21). Although the addition of a long-term overnight yield target appeared to fix (d) above, the other issues found in the
baseline scenario set are still present, even exacerbated for example, for (a) negative rates are even more extreme, and for (c) equity indices have even more extreme tails. This highlights how calibrating ESG models can be complicated; i.e., recalibrating to fix a particular issue can easily have unforeseen consequences, often exposing new issues or exacerbating existing issues. The ESGWG suggests discussing the properties that scenario sets used for reserves/capital should have, and understanding the degree to which desired scenario set properties can be achieved via recalibration of real-world (RW) and/or risk-neutral (RN) parameters. It may be that certain desired scenario set properties are out of reach given constraints on calibration and/or model structure.

6. Scenario Sets—Accompanying Report
   To facilitate reviewing newly published scenario set files, the ESGWG suggests adding: (A) a new section on Model Input, and (B) additional statistics and charts for the existing section on Model Output. Additional detail can be found in Exhibit 6.1: Scenario Sets—Accompanying Report.

7. Scenario Sets—File Format
   For use in companies’ existing models, the ESGWG suggests publishing scenario sets in two alternative .CSV file formats: (A) GEMS .CSV file format, which is currently exposed, and (B) the Academy Interest Rate Generator (AIRG) multiple .CSV file format. Additional detail can be found in Exhibit 7.1: Scenario Sets—File Format.

We look forward to further documentation and discussion on the NAIC’s ESG project.

Sincerely,

Jason Kehrberg, MAAA, FSA
Chairperson, Economic Scenarios Work Group
American Academy of Actuaries

Enclosures: Exhibits 2.1, 5.1, 6.1 and 7.1
Exhibit 2.1 – ESG Documentation

There is widespread expectation that the NAIC will be providing sufficient details on the new models so that interested practitioners can attain a complete operational understanding of all aspects of the simulation of model output, calibration of the models, and application of related tools. This expectation was set by the requirement in item I in the Deliverables section of the RFP which states: “[f]ull documentation on the ESG specifications, calibration, and tools.” The requirement of full documentation was reiterated on slide 11 of the October 27, 2020 NAIC presentation of Pat Allison “ESG Implementation Project: Background and Deliverables” which states: “Conning will provide full documentation on specifications, calibration, and tools. This will include: Full documentation of the necessary components used to develop the Basic Data Set.” This is an important commitment since it is the Basic Data Set which is to be prescribed by the NAIC for statutory reporting.

As summarized on slide 7 of the aforementioned October 27, 2020 NAIC presentation, the components of the Basic Data Set are:

- Treasury Yields - 1M, 3M, 6M, 1Y - 30Y by year; Spot and Coupon Yields.

As of the end of February 2021, the NAIC has provided three documents that relate to the models underlying the Basic Data Set:

- NAIC Scenario Set Technical Documentation - Interest Rates Model
- NAIC Scenario Set Technical Documentation - Equity and Dividend Model
- NAIC Scenario Set Technical Documentation - Corporate Yield Model

No specific documentation has been provided on how the bond returns are computed. The NAIC Scenario Set Technical Documentation - Interest Rates Model contains significant information on the treasury interest rate model but does not constitute full documentation. The NAIC Scenario Set Technical Documentation - Equity and Dividend Model provides a sense of how the equity model works but is missing fundamental information. The NAIC Scenario Set Technical Documentation - Corporate Yield Model provides no meaningful details on how the corporate yield model works.

Full documentation must achieve the following outcomes for each of the models used to develop the Basic Data Set.

1. Full specification of model dynamics.
2. Operational description of the calibration process.
3. Mapping of the calibration parameters into the model dynamics.

Full documentation of calibration requires the details of how the parameters for each model are determined and what data is used in the calibration procedure. It is reasonable to expect that someone who has understood the model specification and calibration documents would be able to arrive at similar model parameters. Indeed, the ability to independently reproduce calibration results is an important check and robustness and stability of a model.

Full specification of Treasury model dynamics requires the following:

1. Bond pricing formulas
2. State variable simulation procedure
3. State variable initialization procedure

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4. Initial yield curve fitting procedure
5. Explicit mapping between real world and risk neutral model parameters
6. Documentation should use the original standard notation of Cox, Ingersoll, and Ross

Full specification of Equity model dynamics requires the following:
1. Dynamic specification for equity price return
2. Details of jump process for equity index
3. Correlation specifications for diffusion and jump terms across equity indices
4. Dynamic specification for dividend yield process
5. Any adjustments that need to be made to dividend process when very large jumps occur in the equity process
6. Specific linkages between equity returns and interest rates

Full specification of Bond Fund Return model dynamics:
The bond fund returns models appear to be based on a corporate bond pricing model called the corporate yield model. Therefore, to understand the bond fund returns the details of the corporate yield model are needed, including details on credit spreads, credit migration, loss given default and the relationships between rates/spreads and equity/credit. Similar information detail to what is needed for the treasury model is required. NAIC documents and presentations have indicated that the bond fund returns are based on an index of individual bonds. Therefore, the methodology/rules of the index construction are required.
Exhibit 5.1: Scenario Sets – Rates

Selected ESWG findings on rates baseline scenario set (exposed on 12/18/20):

A. Interest Rate Model
   1. Conning’s interest rate model structure and calibration (i.e., 1M to 2Y) are inverted in most scenarios nearly immediately and in nearly all scenarios after projection year 5.
   2. The frequency and severity of negative interest rates in the exposed scenario set are high
      a. Rates for short-term maturities approach -5%.
      b. Roughly 20% of the 1Y and 2Y yields are negative between projection years 5 and 15, and those rates are negative in more than 15% scenarios over the longer term.
   3. Insufficiently broad range of rates or other anomalies / inconsistencies
      a. 20Y yields were above 8% for much of the period between 1974 and 1990, but exposed 20Y yields are above 8% less than 1% of the time.
      b. While there are more low-rate scenarios than the AIRG, 20Y rates seldom average below 1% over the 30-year projection (and never average below 70-80 bps).
      c. In the exposed scenarios, annualized realized volatility for 20Y yields is nearly double the annualized realized volatility for 1Y yields. This is inconsistent with both Conning’s 1995+ historical period (where 1Y volatility was lower than 20Y) and LATF’s 1953+ historical period (where 1Y volatility was higher than 20Y by ~50%, not double). The relationship between the volatilities for longer and shorter maturities may be contributing to shorter term bond funds having higher volatility and lower returns over the long term.

B. Equity Model
   1. Index returns explode in both tails. In some scenarios equity indices essentially become worthless while other scenarios have indices hundreds of times starting levels by year 30.
   2. Other characteristics of the equity distribution also seem to diverge from historical data
      a. Monthly S&P 500 returns in LATF’s exposure have substantially more negative skew and higher kurtosis than history.
      b. The S&P 500 (price index) has negative returns over 30 years in more than 5% scenarios (even though that has never been observed in history).
      c. The exposed scenarios set international dividend yields to zero even though EAFE dividends have historically been non-zero.
      d. SPX / EAFE correlations seem higher than long-term historical data.

C. Corporate Model:
   1. Credit spreads inferred by taking the difference between annualized corporate and government bond fund income returns suggest that
      a. LATF’s / Conning’s proposed long-term credit spread for bonds in the separate account are lower than the prescribed NAIC general account bond fund spreads.
      b. Extreme credit events in the scenarios appear to be materially higher than historical stresses.
   2. Month 1 income returns for government bonds do not seem to align with time 0 government bond yields. (Month 1 Short Gov income return ~ 1Y UST yield. Expected to align with the 50% 1Y / 50% 5Y given the short-term fund definition.)
Exhibit 6.1: Scenario Sets – Accompanying Report

To facilitate reviewing newly published scenario set files, the ESWG suggests adding the following to the report accompanying scenario sets.

A. A new section on Model Input
   1. Values of the model parameters used to generate the associated scenario set
   2. Starting state variables used to generate the associated scenario set

B. Additional statistics and charts for the existing section on Model Output
   - Unless otherwise specified
     - Selected key rate tenors: 1M, 3M, 6M, 1Y, 2Y, 3Y, 5Y, 7Y, 10Y, 20Y, 30Y
     - Selected funds: all equity and bond funds included in the published scenarios
     - Selected time points: 0.25, 0.5, 1, 2, 3, 4, 5, 10, 20, 30, 40 and 50 years
     - Selected percentiles: 1, 2.5, 5, 10, 25, 50, 75, 90, 95, 97.5 and 99
     - Selected key rate pairs: 1m2s (2Y rate less 1M rate), 3m10s, 2s10s, 10s30s, 1s20s
     - Selected corp bonds: 1Y A, 5Y A, 10Y A, 30Y A, 1Y BBB, 5Y BBB, 10Y BBB and 30Y BBB
     - Selected yield curve shapes: Normal, Flat, Steep, Inverted, Humped (criteria TBD)
   1. Not scenario path dependent
      a. Distribution of Key Rate Pair Term Spreads
         - Key rate term spread (y-axis) by selected time points (x-axis)
         - One chart for each selected key rate pair
         - Legend: mean, min, max, selected percentiles
      b. Table on Key Rate Pair Inversions (no chart)

<table>
<thead>
<tr>
<th>End of proj. mo.</th>
<th>Key Rate Pairs Term Spreads – Percent of Scenarios Where Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1m2s</td>
</tr>
<tr>
<td>0</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>%</td>
</tr>
<tr>
<td>2</td>
<td>%</td>
</tr>
<tr>
<td>360</td>
<td>%</td>
</tr>
</tbody>
</table>

c. Median Key Rate Yield Curves
   - Key rate (y-axis) by key rate tenor (x-axis)
   - One chart showing median key rate yield curves
   - Legend: selected time points

d. Table on Negative Key Rates (no chart)

<table>
<thead>
<tr>
<th>End of proj. mo.</th>
<th>Key Rates – Percent of Scenarios Where Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
</tr>
<tr>
<td>0</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>%</td>
</tr>
<tr>
<td>2</td>
<td>%</td>
</tr>
<tr>
<td>360</td>
<td>%</td>
</tr>
</tbody>
</table>
e. Distribution of Credit Spreads
   o Credit spread (y-axis) by selected time points (x-axis)
   o Charts: one for each selected corporate bond maturity and credit quality
   o Legend: mean, min, max, percentiles
f. Distribution of Default Losses (net of recoveries)
   o Default loss (y-axis) by selected time points (x-axis)
   o Charts: one for each selected corporate bond maturity and credit quality
   o Legend: mean, min, max, percentiles
g. Correlation Tables: (for each selected time point)
   o Table of correlations between selected tenors (change in key rates), selected funds (total returns), selected corp bonds (credit spreads), selected corporate bonds (default losses),
   o Table of correlations between a modeled key rate or total fund return and its volatility
   o Table of correlations between 10Y key rate and 2s10s term spreads
   o Table of correlations between 10Y key rate and 10s30s term spreads
h. Tables on Frequency of Yield Curve Shapes (TBD) and Transitions Between Shapes
   o Frequencies: At selected time points, over successive 10-year periods, and in total
   o Specific metric TBD
i. Table on speed of reversion to equilibrium/ultimate state
   o Specific metric TBD
j. Table on low interest rate persistency ("low for long")
   o Specific metric TBD

2. Scenario path dependent
a. Distribution of Cumulative Arithmetic Averages of Key Rates and Total Fund Returns
   o Cumulative arithmetic average (y-axis) by selected time points (x-axis)
   o One chart for each key rate tenor and fund
   o Legend: mean, min, max, selected percentiles
b. Distribution of Cumulative Geometric Averages of Key Rates and Total Fund Returns
   o Cumulative geometric average (y-axis) by selected time points (x-axis)
   o One chart for each key rate tenor and fund
   o Legend: mean, min, max, selected percentiles
c. Distribution of Volatilities of Key Rates and Total Fund Returns
   o Volatility along each scenario path from time 0 to time t (y-axis) by time points (x-axis)
   o One chart for each key rate tenor and fund
   o Legend: mean, min, max, selected percentiles
d. Distribution of Cumulative Accumulation Factors of Key Rates and Fund Returns
   o Cumulative accumulation factor (y-axis) by selected time points (x-axis)
   o One chart for each key rate tenor
   o Four charts for each fund
      i. Total return
      ii. Price return
      iii. Dividend return
      iv. Excess return
         - Equity funds: Relative to the short Treasury rate
         - Bond funds: Relative to the Treasuries used to model the underlying bonds
   o Legend: mean, min, max, selected percentiles
e. Cumulative Risk/Return Profiles
   - Mean cum volatility (y-axis) by mean cum geometric average total return (x-axis)
   - Charts: one for each selected time point
   - Legend: selected funds
Exhibit 7.1: Scenario Sets – File Format

For use in companies’ existing models, the ESWG suggests publishing scenario sets in two alternative .CSV file formats:

A. GEMS .CSV file format, which is currently exposed, but with the following additional fields:
   1. Interest Rates – The values of the three state variables and their associated random numbers
   2. Equity and Bond Fund Returns – The random deviates for the Wiener process and jumps.

B. AIRG multiple .CSV file format:
   1. Interest Rates – One file with spot (annual effective) rates, one file with coupon (BEY) rates, each with the following 12 columns: Scenario, Time, 0.25y, 0.5y, 1y, 2y, 3y, 5y, 7y, 10y, 20y, 30y. The ESWG feels that these 10 points on the yield curve, appropriately interpolated, are adequate when doing projections for principle-based reserve and capital calculations.
   2. Equity and Bond Fund Returns – One file for each fund modeled by the ESG, with Time across the columns, Scenarios down the rows, and data showing total return only (not split by price and income).

"The ESWG also notes the current AIRG can produce scenario sets with projection lengths up to 100 years to support insurance products with very long durations, e.g., SPIAs and some life insurance products. Therefore, for the files specified in both A and B above, actuaries will need similarly long projection lengths out of the new ESG."
Brian Bayerle  
Senior Actuary  
March 24, 2021  

Mr. Mike Boerner  
Chair, NAIC Life Actuarial (A) Task Force (LATF)  

Mr. Philip Barlow  
Chair, NAIC Life-Risk Based Capital (E) Working Group  

Re: ACLI Comments on Economic Scenario Generator Exposure  

Dear Messrs. Boerner and Barlow:  

The American Council of Life Insurers (ACLI) appreciates the opportunity to provide comments on the exposures related to the economic scenario generator (ESG) project. ACLI is committed to working with regulators on the modifications and implementation of Conning’s GEMS as the replacement for the current Academy Interest Rate Generator (AIRG). We acknowledge that the current generator has clear shortcomings and further acknowledge the need to get an improved generator in place as soon as possible.  

That said, our initial analysis of the scenario set has surfaced anomalies and scenario results that we consider inappropriate. These anomalies include significant and sustained negative interest rates, a large number of yield curve inversions, extreme equity returns, and low Sharpe ratios for certain equity indices, none of which is consistent with historical experience. The underlying causes of these issues are not currently clear due to the absence of detailed documentation and may be deeply rooted in the model. For this reason, we request more thorough and comprehensive documentation which will aid in understanding of the model and make the decisioning and testing process more efficient. While ACLI recognizes the need to get a better generator in place as soon as possible, our observations to date do not give us comfort in the current state of the proposed model which may indicate timeline issues. We believe that the implications of the collective set of decisions must be understood in order to avoid potential unintended consequences (i.e., addressing one concern but creating another). We support a timeline that ensures that the new generator is fit for purpose.  

Our letter is organized as follows:  

I. Overarching Comments  
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B. Needed Additional Documentation  
C. Timeframe Considerations  

II. Comments on Treasury, Corporate, and Equity ESG Goals and Proposed Recommendations  
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V. Comments on Other Related Topics  

I. Overarching Comments  

The Conning model represents a structural change relative to the current model, with interrelationships that should be vetted and understood. The components of GEMS (i.e., interest rate, equity, and corporate models) are linked, and their calibration (e.g., interest rate mean reversion level, volatility, and shift; equity risk premiums; jump parameters) should be evaluated holistically because a decision on one parameter or scenario property may have direct and indirect effects on scenario dynamics for multiple risk factors (e.g., changes to interest rate parameters will affect equity returns) both at a point in time and between reporting periods. In addition, the ESG has a complex relationship to the statutory requirements.

We believe that appropriate vetting and discussion of the key decision points is necessary so that regulators and industry can achieve the goal that the generator is fit for purpose in calculating reserves and capital. The discussion should go beyond individual technical decision points that, in a vacuum, may be reasonable but lead to an unreasonable scenario set. There should be a discussion of stylized facts and expectations around the results and their consistency with the relevant historical period. While the definition of the appropriate historical period can and should be debated, the results produced by the generator should be reasonable through the lens of that historical experience. As a reference to help assist in this discussion, Appendix One of our document outlines desirable attributes for the generator, which are further reflected in our specific comments on the exposures.

The focus of our following comments is the 12/31/2019 revised baseline scenario set and includes preliminary observations on the 12/31/2020 scenario set.

   A. Anomalies in Scenarios  

ACLI believes that the scenario generator should create a scenario set that reasonably reflects history, with some allowance for more extreme environments. Our initial analysis of the 12/31/2019 scenario set, however, has revealed several significant concerns. These concerns still appear to be present in the 12/31/2020 scenario set and may be generally exacerbated by lower initial interest rates.
**Negative Rates:** The revised 12/31/19 scenario set is generating significant and sustained negative interest rates. Short-term yields fall as low as -6.2%. Yields for maturities shorter than 1Y are negative during roughly 20% to 25% of the scenarios in projection years 5-15. Those yields are negative in ~15% to 20% of scenarios in the long term as illustrated in the following graph:

The frequency of negative rates is even more extreme (e.g., over 45% of scenarios have negative short-term yields in the first year) in the 12/31/2020 scenarios.

We believe that the projected frequency and severity of negative rates should be more consistent with historical US experience. Historically, no period of negative rates has lasted for a meaningful period of time in the US.

**Yield Curve Inversions/Realized Volatilities:** We are concerned by the number of inversions occurring within the scenarios. Based on our initial analysis of the revised 12/31/19 scenario set, the frequency of yield curve inversions appears elevated vs. history. While the revised baseline calibration addressed the 100% rate inversion problem in the initial set, inversions for short maturities are still relatively frequent (~25% of scenarios) as shown below:
The frequency of short rate inversions also worsens dramatically in the first five years of the 12/31/2020 scenarios.

In addition, realized volatilities for short maturities (e.g., 1-year rates) are roughly double the realized volatilities for long maturities (20-year rates). This is inconsistent with the historical data set used in Conning’s calibration and may also be contributing to other concerns with the scenario distribution we have observed (e.g., the ability to produce interest rate dynamics in recent history as well as the 1970s / 1980s, unintuitive long-term risk/reward relationships between bond funds).

We believe the yield inversions and realized volatilities should be more consistent with observable historical data.

**Extreme Equity Returns:** We have observed, as shown below, unusual distribution characteristics and jumps in the initial scenario set, the cause of which is unclear. At the extremes, there are scenarios that assume that equity indices essentially become worthless (see chart below for an example). The original baseline also includes indices that are 1000+ times (>100,000%) higher by year 30. We would like a better understanding of jump process / parameters & comparison of returns after jumps vs. history (which includes strong market recovery in a relatively short time period after jump down). The S&P 500 (price index) has negative returns over 30 years in 12% of scenarios even though this has never been observed in history. In the over 90 years of S&P 500 (SPX) data since 1928, monthly losses larger than...
25% and 20% have only occurred once (Great Depression) and 3 times (1929, 1932, 2008), respectively. Monthly declines of more than 25% occur in over 14% of Conning’s 30-year scenarios.
Mean Equity Returns / Return Relationships: Conning’s recommended calibration has a significantly lower view of long-term equity returns relative both to history and the AIRG. The model returns should be calibrated similarly to the AIRG, with the addition of recent history. In particular, low EAFE returns and higher SPX/EAFE correlations may be contributing to inconsistencies in the risk return relationship between different equity indices. We observe that the average Sharpe Ratio over 30 years for EAFE is ~18% vs. ~33% for S&P 500 in revised baseline scenario set as of 12/31/2019.

B. Needed Additional Documentation

Additional documentation will help enable industry to provide more constructive insights for a higher quality generator and a more efficient process. There are gaps in the interest rate model documentation (e.g., determination of the state variables), with more significant gaps noted in the equity model documentation (e.g., EAFE model, distribution, and correlation of jump processes) and the corporate / credit model. We note that the corporate model drives bond fund returns in the Basic Data Set, so while companies may not need the granular credit output in the Robust Data Set on an ongoing basis, the information is needed to appropriately vet the Basic Data Set.

We request the following additional documentation to assist in our review, noting while some of this may have been included in the March 18th exposures, the materials do not appear to substantively address the issues outlined below:

- Explanations of model selection considerations and theoretical justification for model choices (e.g., 3-factor vs. 2-factor model, formulaic equity risk premium relationship) as
these decisions determine fundamental scenario properties and their suitability for purpose.

- Direct and indirect relationships (e.g., equity risk premium, equity/credit, rate/spread relationships), including formulas, correlations, and any relationships imposed via judgment
- Methodology and formulas used to determine fund returns, including the composition of bond indices and derivation of bond fund returns, use / modeling of exchange rates in international equity returns
- State process information, including all distributions and correlations
- Calibration information, including model parameters and calibration targets at multiple points in time, methodologies for setting initial values and long-term targets, how and where historical data is used and the benchmarks used, the process and judgment used when a calibration fails, and identification of the values that would be updated at each reporting period, regularly, or based only on triggering events
- The criteria for evaluating the reasonability of each published scenario distribution (beyond validating that targets are reproduced)

In addition to documentation for Conning’s model and calibration, LATF should develop and document target scenario properties or stylized facts which can be done on a parallel track as documentation becomes available. Targets such as the original C-3 Phase 2 equity calibration points may be useful. It is important to confirm that the Conning generator and calibration can meet those targets under an appropriate range of market conditions and other sensitivities.

C. Timeframe Considerations

We encourage the Task Force to regularly assess the status of the timeline in light of the many steps to be completed prior to implementation. ACLI suggests the following considerations for additional milestones or adjustments for the expected timeframe of existing milestones:

- Additional time may be necessary to understand and confirm the suitability of the model and its calibration. Considerations include availability of documentation and adequate time to understand it, deliberation of key calibration decisions, adequate time to test impacts of changes, sensitivity testing and forecasting, and implementation to valuation systems and other processes. Additionally, smaller companies could be put at a disadvantage due to fewer resources to test and implement the change.
- Additional education sessions for regulators and interested parties may be necessary once more documentation is available to thoroughly understand the generator.
- The field testing start date may already be coming under pressure due to the lack of adequate documentation. There is currently no viable candidate for field testing as there are significant concerns with the revised baseline as noted in ‘Anomalies in Scenarios’.
- The timeline should provide time for consideration of reassessing generator modification(s) and parameters after the assessment of the field study results.
- Consideration in the implementation timeline should also contemplate time for companies to evaluate the potential impact of the new ESG on statutory reporting, risk management & hedging (due to changes in economic sensitivities), and system implementation.
We encourage the regulators to regularly assess the status of the timeline since failure to meet current and suggested milestones may adversely impact the timeline.

II. Comments on Treasury, Corporate, and Equity ESG Goals and Proposed Recommendations

ACLI agrees with many of the stated goals for the generator and notes the importance of a holistic view of how these come together for a generator that is deemed to be fit for purpose. This holistic view of the exposed scenario sets (which are based on "mixing and matching" of the Conning Standard Calibration parameters with the selected adjustments and overrides presented in the list of "ESG Goals") gives us some concerns about the viability of these recommendations and may require a fundamental or first principles recalibration of Conning’s model or selected model refinements to resolve these concerns. We have broken down our comments into three categories: areas of support, areas for improvement with additional dialogue or documentation, and areas of significant concerns:

A. Areas of Support

Treasury goal #1 (Initial Yield Curve): We support the goal that the model’s starting yield curve should match the actual starting yield curve as closely as possible. Our initial analysis suggests that the model would have had difficulty fitting historical rate curves. Based on our analysis to date, adjustments to the model beyond the grading period recommendation may be needed to fulfill this objective.

Treasury goal #4 (Range of Results): We support the goal that the model should be capable of producing a reasonable range of results for very long simulations. Based on our analysis to date, adjustments to the recommendation may be needed to fulfill this objective.

Treasury goal #5 (Sustained Low Rates): We support the goal that the ESG should be capable of producing low interest rates for an extended period of time. The definition of “low for long” should be based on plausible expectations and should be considered in conjunction with the broader scenario distribution. We observe that lowering the mean reversion point alone is not sufficient to achieve this goal. The structure of the mean reversion point, the mean reversion speed or strength, and volatility need to come into play so that scenarios have the appropriate degree of dispersion.

Regarding the speed of mean reversion, we observe that the exposed scenarios do not appear to be consistent with the recommendation of alignment with the current Academy scenarios. The GEMS scenarios (both original and Revised Baseline exposures) have significantly slower median reversion than the current Academy scenarios (as observed in the following chart). This difference may reflect structural differences between GEMS and the AIRG. Starting from 12/31/2019 initial conditions, median long-term rates in the Conning generator are 40 basis points below the corresponding AIRG median after 30 years. When mean yields do not approach their target within a typical projection period, it effectively results in an inadvertently lower target in today’s low-rate environment. Additionally, mean long-term yields decrease for
the first several months in the Conning generator. It is unclear if this is intended or an unintentional side effect of the model calibration.

**Equity and corporate goal #1 (Returns are Representative):** We support the goal that returns should be provided for the types of funds representative of those offered in U.S. insurance products.

**B. Areas for Additional Dialogue/Documentation**

**Treasury goal #2 (Variety of Curve Shapes—also see above):** We support the goal that the model should produce a variety of yield curve shapes, and they should change over time. We recommend additional review of the appropriateness of yield curve shapes and the acceptable frequency of specific shapes (e.g., frequency of yield curve inversions, consideration of limitation of time for inverted curves).

**Treasury goal #6 (Sustained Volatility):** We support the goal that the model should produce interest rate levels that fluctuate significantly over long periods. Currently, we do not yet support the recommendation to use the GEMS volatility estimate. The volatilities from the initial scenario
set do not look to be related to the relevant historical period and are not explained by the available documentation. The volatilities may also be a source of the anomalies described above.

**Treasury goal #8 (Historical Data Period):** We support the goal that the ESG should be calibrated using an appropriate historical period. We would support consistency with the Academy generator’s historical period (starting in the 1950s), extended to include the most recent available data. Critical to this goal, the historical period should be consistently applied across the underlying calibration of state variables. Since Conning has effectively locked in significant aspects of their 1995+ based standard calibration (e.g., risk-neutral parameters, volatilities), it is unclear where they have reflected the data since 1953 in their calibration (other than when superimposing the mean reversion target). Using interest rate volatilities based on data since 1995 (generally a lower rate and lower volatility period) may lead to an insufficiently broad range of rates, which may not sufficiently capture disintermediation risk (from high-rate scenarios), and lead to other anomalies / inconsistencies.

**Equity and Corporate Goals #2 (Calibrated to Historical Period):** We support the goal that the ESG should be calibrated using an appropriate historical period. From the available documentation, it is not clear what historical period is currently being used by Conning. Consistent with Treasury goal #8, we believe the Academy generator’s historical period extended to include more recent data would be an appropriate period. Further, the scenarios that are generated by the model should be reasonable compared to the historical period results. The examples illustrated previously suggest areas where the revised baseline scenarios may be unreasonable (such as severely negative cumulative returns).

**Equity and Corporate Goals #3 (Stochastic Volatility):** We do not oppose the goal that the equity model should have stochastic volatility and that the initial volatility should be updated periodically. However, realized equity volatility appears to be higher in the Conning scenarios than in the Academy scenarios, and we do not have sufficient documentation to opine on the underlying rationale for this observed higher volatility. Stochastic volatility, if it exists, needs to decline over time to avoid arbitrage within the scenario sets. While we believe that there should be a defined process for updating initial volatility, the frequency and basis for the updates will need to be considered in conjunction with Conning’s jump process since the linkage between volatility and the jump process may increase the risk of procyclicality (e.g., higher likelihood of market stresses after a recent drop).

**Equity and Corporate Goals #6 (Higher Correlation in Tail):** We believe correlations between equity indices in stressed markets should be consistent with relevant historical data. We do not have sufficient documentation to opine on whether Conning’s approach is reasonable. Given the complexity of Conning’s model, we would like to understand Conning’s theoretical approach rather than focus on the results from any given scenario set.

**Equity and Corporate Goals #8-11 (Model for Returns, Separate Yield Curves by Rating, Stochastic Spreads, Dynamic Bond Credit Transitions):** Conceptually, we support the goals to have stochastic spreads, credit migration, granular credit modeling, and consistency between basic and robust data sets. However, we have several concerns:
1. We lack sufficient documentation on GEMS' underlying credit model, assumptions, or existing calibration.
2. We would like to understand the basis and consequences of discrepancies between prescribed general account credit assumptions and Conning's assumptions and resulting credit scenarios.
3. It is unclear whether the tradeoff of a more sophisticated model is worthwhile relative to the increased complexity and lack of transparency (i.e., a significant amount of critical information only available in the Robust Data Set).

C. Areas of Significant Concern

Treasury goal #3 (Negative Rates—also see above): We do not inherently oppose the concept of negative interest rates. That said, we believe that the projected frequency and severity of negative rates should be similar to historical US experience and not be unduly influenced by experience in other economies outside the US. Historically, no period of negative rates in the US has lasted for a meaningful period of time. Negative rates are influenced by many model parameters, and each may entail different, potentially undesirable tradeoffs. In addition, the use of arbitrage-free scenarios may be contributing to the disconnect between the model and historical experience. While arbitrage-free scenarios are desirable (Treasury goal #7), a compromise may be preferable if necessary to prevent unrealistic scenario properties.

Equity and Corporate Goals #7 (Link between Equity and Treasury): We do not support the formulaic linkage between equity returns and Treasury yields given the lack of historical evidence. The existing approach in the AIRG allows for varying levels of correlation between rates and equities. At the same time, the correlations in the AIRG average close to zero across the entire distribution and have a historical basis. The selection of a strict formulaic relationship between equity returns and Treasury yields in every period appears to be driven by operational considerations (i.e., ability to simultaneously generate risk-neutral scenarios) unrelated to the NAIC’s objective, fundamentally changes the nature of the scenarios, and is not supported by historical data. Intuitively, this relationship has not held in every period due to other macroeconomic factors. If it did, the late 70s and early 80s would have had high returns for equities, and the current low interest rate environment would have poor returns. Equity risk premium relationships have varied significantly over time in a manner that is unlikely to be well represented by the current recommendation.
The proposed relationship is also likely to be a source of non-economic volatility. Reserves and capital will be sensitive to changes in overnight interest rates even though the underlying insurance liabilities generally would not be. This relationship may create an incentive to hedge against changes to the overnight rate due to the artificial dependency in the ESG. We note how Conning’s adjustment to target overnight rates in the revised baseline reduced equity returns by roughly 40% by year 30. Changes in actual overnight rates would also affect equity return paths in a manner that is unlikely to be offset by changes in other scenario parameters. For example, in the 2020 scenario set, equity index levels were approximately 10% lower at year 30 relative to the 2019 scenario set due to the lower initial overnight rates. However, the relationship varies at different periods, so any attempt to compensate for the change via high level adjustments to the equity risk premium would under/overcorrect depending on the product, introducing unintuitive results and volatility.

The revised baseline changes also illustrate how the explicit linkage may force unnecessary compromises between rate and equity distributions. The change to address a rate shortcoming in the original 12/31/19 baseline scenarios appears to have created or exacerbated inappropriate equity return distributions. Overall, we suggest an approach closer to the one used by the existing AIRG.

**Equity and Corporate Goals #4 (Model Jumps):** We do not oppose the goal of the ESG having the ability to generate very large losses and gains in short periods of time (i.e., jumps), but we have potential concerns about the recommendation to use Conning’s existing calibration given the extreme results observed in the upside and downside tails previously noted and so cannot yet support this recommendation. Additional information will help us assess the appropriateness of the existing calibration.

**Equity and Corporate Goals #5 (Long Recoveries):** While we do not oppose the goal of having some equity scenarios reflect the possibility of a very long recovery after a period of losses, we have observed that a large portion of 30-year returns for indices in the revised baseline scenario set seemed highly adverse (see comments on extreme equity returns above). Additional
documentation may help us understand the drivers of these outcomes. We believe that recovery scenarios should be calibrated to appropriate history.

III. Comments on ESG Scenario Statistics and Reports

We suggest that the generator produce the following additional statistics. Note that we may request additional statistics once we have sufficient documentation to better understand the GEMS model.

- Additional percentiles, particularly in the tail in the fan charts (or supporting data tables)
- Period-over-period (i.e., between reporting date) comparisons in the fan charts
- A distribution (fan chart) of cumulative average interest rate paths
- A distribution (fan chart) of total and price return accumulation factors for all equity and bond funds
- A distribution (fan chart) of credit spreads and default losses driving the Basic Data Set bond fund returns
- A graph of the percentage of scenarios with negative rates (at the key 10-11 points on the yield curve) or inverted yield curves (for selected rate pairs) by projection month
- Information on the prevalence of other yield curve shapes (e.g., normal, steep, inverted, humped)
- Realized interest rate volatility statistics for short and long maturities
- Equity return volatility, skew, and kurtosis statistics
- A distribution (fan chart) of equity risk premiums
- A table showing the distribution of correlations between equity returns and bond funds, interest rates and equity returns, credit spreads and equity returns over the scenario projection (correlations should be over the scenario or meaningful periods, not individual years).

IV. Comments on ESG Scenario Picker Tool, Stochastic Exclusion Ratio Test, and Data Formats

We suggest deferring discussion of these items until the scenario set itself is determined. In the meantime, we offer the following considerations:

- Since scenario selection will only be available as posted files and not a tool, clarification on how scenario selection will be implemented for companies licensing the API should be provided.
- Documentation on how the new SERT percentiles are applied (e.g., to return vs. accumulation factor distributions, the conditional versions of those distributions based on the GEMS cascade structure (and therefore available only to Conning) and whether the approach captures the range of scenario outcomes intended for SERT (e.g., low rates/high equity leads to low rates/high equity given low rates (= lower equity)).

V. Comments on Other Related Topics

- Governance: We agree with Conning on the importance of appropriate governance in this process. We would encourage as much of the ESG specifications to be incorporated into the Valuation Manual as possible. Appropriate items to consider include the setting
Desirable Properties of the Economic Scenario Generator

Stochastic Scenario Properties

- A single set of economic scenario requirements should apply to all products for which stochastic modeling is required.

- The prescribed scenario generator should be “fit for purpose” and produce a reasonable baseline set of economic scenarios. There should be a balance between complexity, transparency, and ease of use, and stability of scenario generator parameters.

- The scenario generator should have a sound fundamental basis. The generator parameterization should be based on relevant historical experience and produce a realistic distribution of real-world scenarios, including plausible and coherent tail stresses.

- The scenario generator should be based on best estimate assumptions to avoid unintended consequences between different products. For example, FIAs may have upside risk that would not be captured if the scenario parameters reflect additional margins geared towards products more sensitive to downside risk, such as VA GMxBs.

- The scenario generator should be viewed holistically, rather than focusing on narrow aspects of the generator. Refinements to the scenario generator should not be biased in one direction.

- Economic elements should be internally consistent. Bond fund returns should be consistent with the stochastic generator’s interest rate and credit assumptions or guidance.

- Updated generator parameterizations and their impacts on scenarios and results should be intuitive/explainable. The parameterizations should be stable.

- The scenarios should reflect initial market conditions where applicable and should not be disproportionally impacted in the long-term by initial market conditions. For example, the generator starts at the initial actual treasury rate curve and credit spreads when projecting both interest rates and bond fund returns.

Stochastic Scenario Governance

- Governance rules should be established for both routine updates (i.e. updating starting yield curve with recent actual results, calibration criteria, etc.) and periodic holistic review/validation of the generator.
  
  - Reviews and updates should be performed by a third party, vetted for complex interactions between the parameters and potentially significant impacts, and documented in sufficient detail for independent review.
  
  - The initial development process of the scenario generator should allow adequate time and resources for field testing to ensure all intended stochastic scenario properties are met.
  
  - Updates should allow for attributions, and field testing should be considered for more substantial changes.

- Non-prescribed generators should be permitted, subject to appropriate governance. Calibration criteria should be developed by the vendor so that the prescribed generator and non-prescribed
generators can be validated based on scenarios produced rather than reserve and capital results. Different scenario generators and/or parameters may produce a materially similar distribution of scenarios and results.

- Other stochastic scenario uses (e.g., hedging, ALM, risk management) may require more sophisticated economic scenario modeling (e.g., explicit credit spread, default, and migration modeling). Allowing companies to use their risk management generators for stat valuation, provided the scenarios meet specific criteria for all elements included in the prescribed scenario generator, promotes better risk management without imposing unnecessary complexity on all statutory scenario stakeholders (i.e., companies and regulators).

Production Implementation Requirements

- The prescribed generator must automatically output prescribed scenarios in a common electronic format.

- The prescribed generator should be open source and sufficiently documented so that companies can call or otherwise implement the generator in their valuation, projections/forecasting, or risk management models. Providing just pre-generated scenarios on a quarterly basis is not sufficient to satisfy all of these purposes.

- Additional scenario tools should also be considered for development.
  - Representative scenario picking tool
  - Tool that generates the VM-21 Company-Specific Market Path method scenarios
  - Tool to generate scenarios for stochastic exclusion test
  - Tools to generate statistics on intermediate and final output of the generator.
of parameters, distribution properties, validation of results, and how the scenarios evolve through time. This will ensure appropriate controls of ESG changes and codify formulaic requirements and decision points that may be revisited over time. This work can begin while we are waiting on additional documentation.

- **Scenario timing:** We request assurance that the generator will be able to produce scenarios on the first day of each month, regardless of whether this falls on a weekend since many valuation processes commence based on a calendar day schedule.

- **Projection Period:** The projection period of the scenarios should be at least 70 years.

- **Sensitivity testing and forecasting:** It is unclear how scenarios for VM-20, VM-21, and VM-31 sensitivity testing requirements and potential attributions in Model Audit Rule key controls will be supported by the proposed process. For example, will additional scenario sets be generated and posted, or will companies be required to license the Conning API or full system to meet regulatory requirements or to understand and prudently manage their reserves and capital? The impact of changing economic conditions on the resulting scenario distribution will be vital for companies to understand for multiple reasons, including risk management & capital planning.

- **C-3 Phase 1 (C3P1) RBC testing:** Methodology clarifications will be needed if C3P1 is included in the ESG field study. Given the ongoing VM-22 discussions and their potential impact on C3P1 methodology, there are additional issues that may need to be addressed as part of the VM-22 field testing.

- **C-3 Phase 2 (C3P2) CTE Level:** We note that the revisions to C3P2 included the consideration of a scenario set with higher volatility, which was accompanied by a lower suggested CTE level (this is the CTE 95 vs CTE 98 discussion related to C3P2 TAR). Given that these decision points were contemplated as a package, the required CTE levels may need to be reconsidered in light of changes to the ESG.

We look forward to a discussion on this important initiative.

Sincerely,

[Signature]

cc: Reggie Mazyck, NAIC
    Dave Fleming, NAIC
DATE: March 22, 2021
FROM: Aaron Sarfatti, Chief Risk Officer; Steve Tizzoni, Head of Actuarial Regulatory Affairs
SUBJECT: Equitable Comments on Economic Scenario Generator (ESG) Proposal

Executive Summary

Equitable appreciates the opportunity to comment on the Economic Scenario Generator exposures. The table below summarizes our viewpoints and comments on the exposed 12/31/19 scenario set, with more detail on select items following in the remainder of this letter.

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<th>Topic</th>
<th>Equitable Position</th>
<th>Rationale / Commentary</th>
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<td>Modeling methodology</td>
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<td>GEMS Interest Rate Model (Form)</td>
<td>Favorable</td>
<td>+ GEMS functional form enables tailoring of distributions and is superior to current ESG</td>
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<td></td>
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<td>+ Enables arbitrage-free (or close to), which is appropriate for interest rates</td>
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<td>GEMS Interest Rate Model (Calibration)</td>
<td>Adequate distribution of rates in 12/31/19 set, but select rates are “too negative”</td>
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<td></td>
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<td>+ Adequate share of low-for-long in the 12/31/19 scenario set</td>
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<td>- Rates as low as -6% are too extreme (Europe since 2008 a better downside benchmark)</td>
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<tr>
<td>Equity Return Model (Form)</td>
<td>Favorable</td>
<td>+ GEMS functional form enables tailoring of distribution to stylized facts and historical equity markets</td>
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<td></td>
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<td>+ Ability to reflect market jumps and volatility clustering</td>
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<tr>
<td>Equity Return Model (Calibration)</td>
<td>Some concern regarding distribution of returns</td>
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<td>- EAFE index returns meaningfully below US returns on a risk-adjusted basis</td>
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<td>- Wide equity tails will disadvantage equity risk vs. correlated long-term credit risk</td>
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<td>Alternate starting environments</td>
<td>Favorable properties should be verified in alternate starting environments</td>
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<td>• Recommend releasing scenarios under other conditions beyond 12/31/19 and 12/31/20</td>
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<td>• Purpose is to 1) verify that favorable properties hold in other market conditions and 2) understand how scenarios react to different starting market conditions</td>
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<td>Process and documentation</td>
<td>Addition of select exhibits will facilitate effective review</td>
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<td>ESG Summary Reports</td>
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<td>• Recommend exhibits summarizing distribution of average long-term UST rates and cumulative equity returns (see below)</td>
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<tr>
<td>Documentation</td>
<td>Continue expanding documentation</td>
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<td>• Recommend additional documentation as delineated in ACLI comment letter</td>
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Technical Review of Scenario Sets #1 (Original) and #2 (Revised Baseline): Equitable has reviewed the original 12/31/19 scenario set (exposed in December 2020) as well as the revised 12/31/19 baseline set (exposed in February 2021) and offers the following feedback:

Distribution of Interest Rate Scenarios: Equitable believes that it is critical to have an appropriate distribution of interest rate scenarios in order for this initiative to be successful. This includes appropriate (1) low interest rate levels; (2) negative interest rate levels/amounts; and (3) interest rate shapes.

(1) Low Interest Rates: The original and revised baseline interest rate scenarios, both as of 12/31/19, were calibrated using the mean reversion parameter (MRP) from the current Academy Interest Rate Generator (AIRG) but using the substantially higher GEMS volatility. This calibration significantly increases the number of sustained low interest rate scenarios. Under this calibration, approximately one fifth of scenarios have an average 20-year treasury rate at or below 2%, below the actual 20-year treasury rate of 2.25% at 12/31/19. In contrast, under the current AIRG, less than 2% of scenarios have an average 20-year treasury rate at or below 2%. Equitable commends the NAIC on the increase in low interest rate scenarios, as we believe the current AIRG is woefully insufficient in this regard.

(2) Negative Interest Rates: Equitable reviewed the scenarios for negative interest rates and found that the minimum short-term interest rates approached -4.8% (original scenario set) and -6.2% (revised baseline), which is extreme and would likely lead market participants to take extreme actions (e.g. physical cash hoarding, etc.) if they persisted for any meaningful amount of time. Equitable believes that the recent European experience with negative rates is a reasonable benchmark to establish a lower bound on negative rates.

(3) Term Structure of Interest Rates: Equitable observed a significant number of scenarios with inverted yield curves, especially at the shorter maturities, which seems anomalous. Under the revised scenario set, we observed a 1-month UST rate above the 2-yr UST rate in approximately 25% of time steps across all scenarios. While the revised scenarios are significantly improved vs. the original scenarios in this regard, the amount of yield curve inversions is still above what one would expect based on historical experience. Equitable encourages further discussion between industry and regulators on this topic.

Equity Returns:

Equitable supports most aspects of the equity return distributions but observes select deviations in the Sharpe Ratio “return-for-risk” principle in select areas. Our specific comments are noted below:

(1) Equitable observed a significant increase in the range of 30-yr annualized equity returns to the downside vs. those in the current AIRG. In particular, under the revised scenario set, approximately 5% of the observed 30-yr annualized equity returns for the S&P 500 were negative. While we believe such a distribution is within the realm of plausibility, we highlight that combined with a CTE 98 capital requirement (which considers the worst 2% of scenarios) this will ultimately require companies either to (a) capitalize for equity risk far more than for equivalent levels of credit risk (a correlated exposure to equities) or (b) increase equity hedging considerably in their CDHS. We observe the US has not witnessed a period of negative 30-yr equity returns in modern history, inclusive of the Great Depression, although such conditions did arise in Japan.

(2) Equitable also observed extreme results for the international equity index (EAFE), where over 10% of the observed scenarios exhibited negative 30-yr annualized returns and the average 30-yr
annualized equity return was only 3.5% - ostensibly a violation of the VM-21 Section 8.C guidance regarding consistency in the Market Price of Risk across indices. Equitable suggests more supporting documentation and discussion on the EAFE equity returns.

(3) Equitable supports the structural linkage between interest rates and equity returns via an equity risk premium as utilized in the exposed GEMS scenarios. We understand that in the current model, equity returns are based on short-term interest rates, which could potentially lead to some of the more extreme equity return scenarios noted above. We would invite the consideration of expressing equity returns as a function of longer-term interest rates (e.g. 10-yr or 20-yr US Treasury rates) as that could help stabilize equity returns from calibration to calibration. In addition, we believe more information regarding how the equity risk premia for each equity index are calibrated is necessary to enable more robust understanding of the GEMS calibration.

**ESG Scenario Statistics and Reports:** Equitable appreciates the opportunity to provide suggestions for the ESG scenario analytics. We believe it is important to look at the distribution of average long-term (e.g. 20 yr.) treasury rates across each scenario in determining the appropriateness of the resulting interest rate scenarios and the extent to which “low for long” interest rate scenarios are reflected. To that end, we suggest the inclusion of bar charts showing the number of scenarios exhibiting average 20-yr US Treasury rate within each of the various ranges shown on the chart. In addition, we believe the following statistics would be helpful to quickly understand future scenario sets:

1. Inversion statistics: comparing points on the yield curve such as the 10Y vs. 2Y rates and 2Y vs. 1-Mo. rates to understand how many scenarios produce inverted yield curves
2. Negative interest rate statistics: examining the frequency / magnitude of negative interest rates
3. Percentile analysis of the 30-year average annualized equity returns across each of the 10,000 scenarios. It is important to look at the cumulative equity return across each scenario as the cumulative return is more impactful to the valuation of long-term insurance liabilities vs. the distribution of returns in any one given year.

**Sensitivity Testing:** Equitable appreciates the ESG parameter sensitivity testing supplied by Conning in February. However, we believe more sensitivity testing of various initial market conditions should be performed, including both upward and downward shocks to the initial yield curve and initial equity volatility parameters. Testing the generator under a variety of economic conditions will allow industry and regulators to better understand the potential movements of the scenarios, which is critical considering the impact the scenarios can have to a company’s balance sheet. While Equitable appreciates that the NAIC will release other scenarios for testing purposes, Equitable suggests making these available as soon as practicable to (1) allow industry to understand how the proposed ESG performs under a range of market conditions and (2) enable robust field testing.

**Initial Review of 12/31/2020 baseline scenario set:** Equitable is currently reviewing the 12/31/2020 scenario set released on March 18th and appreciates the release of this scenario set in response to our inquiry. Our preliminary indication is that the majority of our comments above are still relevant to the 12/31/2020 scenario set with the key exception that “low for long” scenarios are not as well reflected in this scenario set. Specifically, in the 2019 set, approximately one fifth of scenarios had an average 20-year treasury rate at or below the 2.25% 20-year treasury rate on 12/31/19. In contrast, in the 12/31/20 scenario set, only 6% of scenarios have an average 20-year treasury rate below the 1.45% 20-year treasury rate on 12/31/20. Equitable recommends that the scenario calibration approach should ensure a meaningful percentage of scenarios reflecting average long term rates below the current rate on the valuation date regardless of starting conditions. Assigning a 6% probability that interest rates stay at or below current levels appears low given the high degree of uncertainty in accurately forecasting interest rates.
Timeline/Effective Date: Equitable is aligned with the NAIC’s urgency on this matter and current goal for 1/1/2022 implementation. However, developing and calibrating a scenario generator is proving to be a very complex task and ensuring the new ESG is appropriately calibrated and fit for purpose is paramount and potentially may require additional time beyond the current timeline.

Conclusion: Equitable appreciates the opportunity to comment on the ESG proposal and we look forward to working with industry and regulators to develop an appropriate economic scenario generator. We are available to discuss our comments further at your convenience.

Sincerely,

Aaron Sarfatti, Chief Risk Officer and Chief Strategy Officer

Stephen Tizzoni, Head of Actuarial Regulatory Affairs
March 25, 2021

Mr. Mike Boerner
Chair, Life Actuarial (A) Task Force
National Association of Insurance Commissioners

Dear Mr. Boerner:

We appreciate the opportunity to offer comments on LATF’s Economic Scenario Generator (ESG) exposures including Scenario Exposure 3.18.21.

In our opinion, the interest rate scenarios that have been released exhibit some peculiar features. Two features of these scenarios we consider troublesome are the magnitude of negative interest rates and the shape and frequency of yield curve inversion. As you know, a generally accepted rule of thumb in economic scenario generation is that a good economic scenario generator should generate some “extreme but plausible scenarios” with the practical application of this rule guided by the historical record. Negative interest rates with a magnitude of -5% are not compatible with any reasonable interpretation of the historical record.

The new NAIC interest rate model is based on the three-factor Cox, Ingersoll, and Ross framework which has the potential to provide great educational value for the industry, the peculiarity of the exposed scenarios notwithstanding. The Cox, Ingersoll, and Ross model was the first interest rate model to be based on a general equilibrium economy and featured volatility increasing with interest rate levels and the absence of negative interest rates - a condition previously viewed as a desirable feature.

We believe the NAIC should seize the opportunity to guide the insurance industry to a practical understanding of the financial economics modeling literature and its application to insurance risk management. In order for industry to understand these models, it is vital that “[f]ull documentation on the ESG specifications, calibration, and tools” be provided as the NAIC stipulated in section II.A.1 of the March 4, 2020 RFP and was reiterated in Pat Allison’s NAIC presentation of October 27, 2020 as “[f]ull documentation of the necessary components used to develop the Basic Data Set.” We do not know precisely what the NAIC means by “full documentation”. However, we respectfully submit that it should mean that sufficient details are provided so that a determined risk management professional is able to fully understand the model dynamics and be able to approximately reproduce the model output and calibration parameters through a scientific process. We believe this is a requirement for best practice and is essential for the industry to gain confidence in any suite of models serving a fundamental role in the management of an insurance business.

The “NAIC Scenario Set Technical Documentation Interest Rates Model” provides bond pricing formulas but does not mention market price of risk parameters and their role in the model nor how the initial state variables are selected. These two specifications are vital in understanding the model. Market price of risk parameters are typically an essential aspect of this class of interest rate model and are
fundamental in controlling the behavior and performance of the model. The “NAIC Scenario Set Technical Documentation Equity and Dividend Model” provides an equation for the equity dynamics but does not explain how the variable jump sizes in the equity and dividend processes are modeled. These are surely fundamental components of the model and represent a very significant change from the equity model currently in use. The nature of the “government bond yield” used in the dividend process is not stipulated. The means by which equity returns and jumps are correlated/related across the S&P 500, Russell Midcap, Russell 2000, NASDAQ, MSCI EAFE and MSCI Emerging Market indices are not explained. These specifications are vital in understanding the model. The “NAIC Scenario Set Technical Documentation Corporate Yield Model” is introductory, with no meaningful specification of the model given.

Guiding the insurance industry to a working understanding of modern interest rate modeling is a valuable service to the industry and we are hopeful that it will be one of the successful outcomes of the NAIC’s new model.

Yours truly,

Mark Tenney

Hal Pedersen, ASA, MAAA, PhD

PS This letter represents our personal opinions and not those of the Academy of Actuaries or our employers.
March 22, 2021

Comment on Conning GEMS ESG

Mr. Mike Boerner

Chair, Life Actuarial (A) Task Force

National Association of Insurance Commissioners

Dear Mr. Boerner:

We appreciate the opportunity to offer comments on LATF’s Economic Scenario Generator (ESG) exposures including Scenario Exposure 3.18.21.

The Conning GEMS model based on the 3 factor Cox, Ingersoll, and Ross model is a very awkward basis for an economic scenario generator. We developed the original economic scenario generator in the 1990s. Papers on multiple factor CIR models already existed at that time.

Mark and I did not pursue those for the original ESG work because those models are very limited in their relation to other variables. The 3 factors of the CIR model are not even correlated to each other. How they are correlated to equity portfolio returns is problematic, this is also true for credit models. So far, this has not been disclosed by Conning.

An approach that would retain more of the benefits of our original ESG work would be one based on the ideas in the Double Mean Reverting Process. In the DMRP, the short rate is mean reverting to a moving target. The moving target moves towards a fixed target. An analogy is the following. The dog chases the rabbit which tries to get to the hole. But both are on ice, so they skid around randomly. Further developments along this line would give more flexibility both as to an interest rate model and for correlation to equity returns. This type of generator is very flexible and allows the attachment of additional economic series, such as stock, credit, inflation, mortgage and GDP.

We respectfully suggest that the NAIC look in this direction instead of the Conning GEMS model. We believe the Conning model will put the NAIC into the wrong hole at a time when the industry can’t afford another skid.

Sincerely yours,

Steven Craighead

Mark Tenney

PS. This represents our opinions as individuals and not the Academy of Actuaries or any employer.
Hello all –

Scott, thanks very much for the response below about longer projection periods, which was Question 2 of Section F of the 3/10/2021 ESG Q&A. The response also relates somewhat to Question 6 about stratification. We appreciate the enhancement mentioned below to use the stratification process, rather than the response to Question 6 which suggested using the first so many scenarios. One further comment with respect to stratification is that if the smallest stratification was a 40 scenario subset, rather than 50, it would be a subset of the 200 scenario set and the 1000 scenario set. This could be beneficial for instances where people want to evaluate something that is too computationally intensive to do on, say, the 1000 scenario set, such as nested reserve or RBC calculations or some structured security projection models. The “subset property” would enable people to see the effects of the computationally intensive item across the full spectrum of outcomes for a larger set. This could be helpful in estimating effects across all scenarios. In addition, a 50 scenario set is likely not adequate on its own for estimating metrics such as CTE 90 or CTE 98. Thus we would suggest consideration of changing the 50 scenario subset to a 40 scenario subset.

Question 2 related to formatting. Here it may be helpful to have scenarios available in the current format, as suggested, but it is also helpful to the additional indices and data points available for the “full Conning format”. Thus we would suggest consideration of providing two scenario formats. It would also be helpful to have some sort of format identification number, so that people can code up checks on what format they have. Here it would also be helpful to assign a new identification number any time a format is changed.

Lastly, we believe a 9/30/2020 valuation date would be a good choice for the “next additional valuation date”, as this is the date most common to CFT and C-3 Phase 1 testing.

Thanks,
Link
Hi Reggie,

Thank you for all of your efforts to date in working with Moody’s Analytics and Conning to respond to our comments and questions.

We have some additional concerns below specific to the Scenario Picker Tool and Stochastic Exclusion Ratio Test (SERT) scenarios that have been exposed:

**Scenario Picker Tool:**

Two issues are preventing us from reconciling to the scenarios that Conning picked in the latest Dec. 2020 sample set:

1. Conning ranked significance measures from low to high before picking. The picking method embedded in the Academy’s Excel tool ranks from high to low. This opposite ranking order results in different scenario #’s being picked (i.e. ranked scenarios #5, 15, 25, ... 9995 for the subset of 1,000 scenarios).
2. Conning calculated significance measure using some unrounded data. We calculated significance measures using the level of accuracy provided in the static CSV files, which has Treasury rates rounded to 5 decimal places. In the Dec. 2020 sample subset of 1,000 picked scenarios (exposed March 18th), the rounding impacts resulted in only 890 of the 1,000 scenarios matching. 110 scenarios change if you use rounded data vs. unrounded data.

The second issue is of greater importance because end users will not have access to the unrounded data. We believe it would be beneficial to the industry if both of these issues could be resolved, for consistency and validation purposes.

**Stochastic Exclusion Ratio Test:**

We are concerned about the practicality of the targeted percentile approach for dynamically generating these scenarios at future points in time. Is this something that the API can currently do, and if so, how efficient is the runtime? Being able to dynamically project scenario #12 for the calculation of future VM-20 Deterministic Reserves if of particular concern.

We have been able to reconcile some of the data that has been provided in the sample files, but in other areas we would like to request further documentation:

1. Can you confirm that for native equity funds, the target percentiles are applied to wealth accumulation factors at each projection month?
2. For the additional equity funds and corporate bond funds, can you provide documentation about how the “GEMS User Path Technology” calculates these returns based on the user-specified inputs to Treasury and native equity funds?
3. For the inverted yield curve scenario #10, can you provide further documentation about how the targeted percentiles are applied to the spread between short and long term rates? Is the 20 year long rate set to the 50th percentile, with the targeted spread applied to the 1 year short rate?
Additionally, we would note that there appears to be a mistake in the generation of scenario #14 and #15:

4. Scenario #14 is supposed to be a delayed pop up interest / low equity scenario, but appears to be a delayed pop down interest / low equity scenario, making it a duplicate of scenario #16

5. Scenario #15 is supposed to be a delayed pop down interest / high equity scenario, but appears to be a delayed pop up interest / low equity scenario, making it a duplicate of scenario #13

Thanks again for your consideration of our comments and questions.

Regards,

Matt Kauffman, FSA  
Associate Director - Senior Programmer & Actuary

Matt.Kauffman@moodys.com
<table>
<thead>
<tr>
<th>Item</th>
<th>Source</th>
<th>Question</th>
<th>Type</th>
<th>Addressed?</th>
<th>No, why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACLI</td>
<td>What criteria or styled facts did Conning apply and how did they assess the probability of an ongoing bias?</td>
<td>Question</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>ACLI</td>
<td>Are there adjustments that have been included in model development or during the generation of scenarios as a result of these considerations?</td>
<td>Question</td>
<td>Partial</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>ACLI</td>
<td>Model documentation includes all distributions and correlation structures. ESG does not include any information.</td>
<td>Question</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>ACLI</td>
<td>Please provide the scenario file and model parameter analysis (including initial values). Note: The scenarios should be used with the calibrated models.</td>
<td>Documentation Request</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>ACLI</td>
<td>On the 25% cal, Conning indicated that international equity returns use a different model. Please provide documentation for that model as well as any FX model that may affect returns.</td>
<td>Documentation Request</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>ACLI</td>
<td>Please provide the scenario file and model parameter analysis (including initial values). Note: The scenarios should be used with the calibrated models.</td>
<td>Documentation Request</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>ACLI</td>
<td>Please provide the scenario file and model parameter analysis (including initial values). Note: The scenarios should be used with the calibrated models.</td>
<td>Documentation Request</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Chris Conrad</td>
<td>Does Conning use historic returns to determine the incremental equity returns?</td>
<td>Question</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Chris Conrad</td>
<td>What is the basis for the modeling process used to determine incremental equity returns?</td>
<td>Question</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Chris Conrad</td>
<td>How does Conning account for changes in the capital structure of the portfolio over time?</td>
<td>Question</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Description</th>
<th>Question</th>
<th>Yes/No</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Prudential</td>
<td>[Describe] the mechanics of Conning's calibration.</td>
<td>Question</td>
<td>Yes</td>
<td>GEMS_Parameterization_Methodology_NAIC</td>
</tr>
<tr>
<td>12</td>
<td>Prudential</td>
<td>[Discuss] Conning's model selection decision and recommended calibration, e.g., a. How did they pick this type of equity / rate linkage over other approaches, especially given that the different types can produce very different reserve/capital sensitivities? b. How did they get comfortable with the appropriateness of the changes in these sensitivities when certain LATF parameters were incorporated vs. their Standard Calibration?</td>
<td>Question</td>
<td>Partial</td>
<td>Model Selection Slides</td>
</tr>
<tr>
<td>13</td>
<td>Prudential</td>
<td>[Describe] the out-of-the-box capabilities in GEMS to allow different relationships (vs. just substituting different parameter values)?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q12</td>
</tr>
<tr>
<td>14</td>
<td>Prudential</td>
<td>Are there not-out-of-the-box changes that Conning would be willing to consider / implement?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q12 and Q13</td>
</tr>
<tr>
<td>15</td>
<td>Prudential</td>
<td>What would actually change on a monthly basis? a. Are Conning only updating initial conditions (and any LATF-specified formulaic updates — e.g., MRP)? b. Are the updates purely mechanical, or are there any subjective tweaks or judgment calls?</td>
<td>Question</td>
<td>No</td>
<td>To be addressed as part of item #8 in the ESG timeline.</td>
</tr>
<tr>
<td>16</td>
<td>Prudential</td>
<td>What is the LATF exposure / testing / approval process for: a. Other regularly scheduled / routine updates beyond initial condition or formulaic updates (e.g., bringing an additional year of historical data into the calibration)? b. More fundamental model changes (e.g., structural changes, changes in calibration methodology / philosophy)</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section K, Q1</td>
</tr>
<tr>
<td>17</td>
<td>Prudential</td>
<td>What is the process if something unexpected/unanticipated happens in the monthly updates — e.g., routine (business as usual) updates create scenarios that suddenly don’t make sense, or the calibration produces invalid parameters? a. What is the process for reviewing and detecting questionable or inappropriate scenario distribution properties before scenarios are posted? (There should be checks for reasonableness of distribution properties and not just validation that specific targets were reproduced. The scenarios exposed in Dec. reproduced LATF’s / Conning’s intended targets, but the process should have identified the inappropriate distribution of yield curve shapes.) b. What is the escalation process if issues are detected? (Does Conning make judgments on their own? Are regulators and industry at risk of being surprised when unusual scenarios produce unusual reported results or changes in reported results that don’t align with prior sensitivities/dynamics?)</td>
<td>Question</td>
<td>Yes</td>
<td>To be addressed as part of item #8 in the ESG timeline.</td>
</tr>
<tr>
<td>18</td>
<td>Prudential</td>
<td>The International Diversified Equity (MSCI EAFE) and Aggressive Foreign Equity (MSCI Emerging Market) do not have income returns in the sample data set. Will this be adjusted to align with the historical results for these indices?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section F, Q4</td>
</tr>
<tr>
<td>19</td>
<td>Prudential</td>
<td>Why are bond funds assumed to only invest in industrials (not financials or industrials)?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section C, Q1</td>
</tr>
<tr>
<td>20</td>
<td>Prudential</td>
<td>Do BBB bonds reflect a selected BBB bond, a universe of BBB+/BBB-/BBB-bonds, etc.?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section C, Q2</td>
</tr>
<tr>
<td>21</td>
<td>Prudential</td>
<td>How are the international fund returns expressed: hedged or unhedged?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q1</td>
</tr>
<tr>
<td>22</td>
<td>Prudential</td>
<td>How often will the parameters of the model be updated?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section G, Q1</td>
</tr>
<tr>
<td>23</td>
<td>Prudential</td>
<td>See &quot;Prudential&quot; tab</td>
<td>Question/Comment</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Craig Chupp</td>
<td>How are the jump parameters determined and/or set? Does the model reflect recent jump data or long-term averages or a combination of both?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q7</td>
</tr>
<tr>
<td>25</td>
<td>Craig Chupp</td>
<td>How is the value of the mean reversion speed parameter in the Variance Equation determined?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q7</td>
</tr>
<tr>
<td>Page</td>
<td>Name</td>
<td>Question</td>
<td>Response</td>
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</tr>
</tbody>
</table>
| 26   | Jason Kehrberg        | 1. Scenario sets: For both the baseline set exposed on 12/18/20 and the revised baseline set exposed on 2/24/20:  
   a. Treasury model  
   i. What are the starting state variables?  
   ii. What are the randoms for the first time node?  
   iii. What is the initial spread function, i.e., forward rate residual curve, and what has it decayed to at year 1?  
   iv. Is the residual forward spread at year 1 what was fitted at time zero, or is the time zero spread moved forward to year 1?  
   b. Equity model  
   i. What was expected return for each equity index at time zero?  
   ii. What was the first time node with a jump?  
   iii. What are the randoms for that time node?  
   iv. What was the biggest upward jump and the biggest downward jump?  
   c. Projection period  
   i. To be consistent with how some companies currently use the AIRG, can you release scenario sets that go out for 100 years? | Question No |
| 27   | Jason Kehrberg        | 2. Calendar rules  
   a. Is a month 1/12 of a year (delta t = 1/12) and is a week 1/4 of a month (delta t = 1/48)?  
   b. How many weeks-like intervals are used to simulate a year (48 or 52)?  
   i. If 48, what about the duration between two time nodes (consistent, or scaled to make up the extra 4 weeks)?  
   ii. If 52 weeks are used, is 1/52 of 364/365 used for the extra day?  
   iii. What about leap years?  
   c. Does the forward rate residual curve use (i.e. consistent with) the same calendar rules used to simulate forwards? | Question No |
| 28   | Jason Kehrberg        | 3. Equity and bond fund linkage to interest rates – To better understand how equity and bond fund returns change when interest rates and volatilities change:  
   a. Can the equity and bond return pages be added to the 7 fan chart reports for the 7 alternative Treasury calibrations exposed on 2/24/21 (in particular, for the revised baseline as of 12/31/20)?  
   b. Can additional sensitivities be run to provide additional insight into how equity and bond fund returns change when interest rates and volatilities change (in particular, the impact on accumulated wealth ratios)? | Question No |
<p>| 29   | Link Richardson      | On page 13 (of the 1/12/17 LATF Equity and Corporate Model presentation), are the 2 year and 30 year “columns” annualized returns? | Question Yes ESG Q&amp;A, Section I, Q1 |
| 30   | Link Richardson      | On page 18 (of the 12/17/10 LATF Equity and Corporate Model presentation), are the 34 negative thirty year returns for GEMS, and 3 for the AIRG, out of 10,000 scenarios? | Question Yes ESG Q&amp;A, Section I, Q2 |
| 31   | Link Richardson      | Please release a set of scenarios with a 9/30/20 starting date. | Scenario Request No |
| 32   | Mark Tenney           | In the target formulas, it looks like Theta and Lambda get added together in the targets. Why are there two separate parameters? | Question Yes ESG Q&amp;A, Section A, Q3 |
| 33   | Mark Tenney           | Does that imply that the mean reversion speed and level of the embedded risk neutral model (i.e. the model without Lambda and LambdaI) doesn’t impact the scenarios? | Question Yes ESG Q&amp;A, Section A, Q3 |
| 34   | Mark Tenney           | Are there any boundary conditions on the state variables? If so, how does the GEMS model ensure that those boundaries are violated? | Question Yes ESG Q&amp;A, Section A, Q2 |
| 37   | Matt Kaufman          | Does the API accept a starting Yield Curve or is it fed the initial state variables? | Question Yes ESG Q&amp;A, Section D, Q3 |
| 38   | Matt Kaufman          | Does the GEMS Treasury model require the initial state variables to be non-negative? If so, what happens if the initial yields produce a negative state variable? | Question Yes ESG Q&amp;A, Section A, Q1 |
| 39   | Moody’s Analytics     | See “Moody’s Analytics’ Questions” tab | Question No |
| 40   | Scott Schneider       | Will scenarios be consistent from month to month? In other words, will new scenario number 1 be comparable to old scenario number 1 or will the scenarios be an entirely new random set? We would like to see consistency from period to period. | Question Yes ESG Q&amp;A, Section F, Q7 |
| 41   | Scott Schneider       | When parameters are updated, will Genny provide scenarios as of the valuation date before and after changing each parameter? Before and after changing all parameters in aggregate? We would like to be able to assess the impact of the change of each parameter. | Question Yes To be addressed as part of ESG Timeline #B |
| 42   | Scott Schneider       | If 10,000 scenarios are not enough for convergence (particularly for CTE98), what do we do? | Question No |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Question</th>
<th>Frequency</th>
<th>Answer</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>Scott Schneider</td>
<td>What time steps will be available (daily, weekly, monthly, quarterly, annually) within the scenarios? How many years of projection will be provided in each scenario? We would like the ability to get time steps of any frequency from daily to annual. We would also like 90 years' worth of time steps.</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section F, Q7</td>
</tr>
<tr>
<td>44</td>
<td>Scott Schneider</td>
<td>Will individual states (e.g., New York) have different requirements? We would like the scenarios to be provided with and without individual state requirements.</td>
<td>Question</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Scott Schneider</td>
<td>We believe that Conning has stated that the interest rate generator (ISGS) is arbitrage-free, but the equity return generator appears to add a positive risk premium resulting in scenarios which are not arbitrage-free. Is our understanding correct? If so, will there also be an arbitrage-free version of the equity scenarios?</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q6</td>
</tr>
<tr>
<td>46</td>
<td>Seong-min Eom</td>
<td>I propose the scenarios listed below for public comments and review.</td>
<td>Scenario Request</td>
<td>Yes</td>
<td>posted to naic.conning.com/scenario/files 2/24/2021</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The new scenario</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Higher Volatility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alternative Shift</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alternative Start Date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If we can combine multiple revisions, I suggest adding Higher Volatility with Alternative Shift.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Seong-min Eom</td>
<td>In the scenario statistics, I want to suggest adding maximum and minimum in the fan chart (already shown in the summary table) and providing volatility distributions. Also want to have correlations between credit and interest rates, between credit and equities, and between equity funds.</td>
<td>Statistic Request</td>
<td>Yes</td>
<td>These new charts can be seen in the fan charts for the 12/31/20 &quot;Revised Baseline&quot; scenarios</td>
</tr>
<tr>
<td>48</td>
<td>Steve Tizzoni</td>
<td>Please describe the process through which current (@ valuation date) equity volatilities revert towards long term equity volatility targets, with a focus on the speed and strength of the reversion process.</td>
<td>Question</td>
<td>Yes</td>
<td>ESG Q&amp;A, Section B, Q11</td>
</tr>
<tr>
<td>49</td>
<td>Steve Tizzoni</td>
<td>We appreciate the sensitivities that were recently performed and summarized on the NAIC website. Would it be possible to receive the raw scenario output for the 12/31/2020 scenario set?</td>
<td>Scenario Request</td>
<td>Yes</td>
<td>naic.conning.com/scenario/files</td>
</tr>
<tr>
<td>50</td>
<td>Ted Chang</td>
<td>Regarding the construction of yield curve to produce the scenario files.</td>
<td>Question</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Which set of short rate is used, ( r(t) = l(t) + \sum_{i=1}^{n} x_i(t) ) under the real-world measure or ( r(t) = l(t) + \sum_{i=1}^{n} x_i(t) ) under the risk-neutral measure?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Which set of auxiliary functions is used, ( A_i(r), B_i(r) ) with the risk-neutral parameterization or ( \tilde{A}_i(r), \tilde{B}_i(r) ) with the real-world parameterization?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Regarding the risk premiums, how to make sense of the results that each of the sets {\lambda_0, \lambda_1, \lambda_2} and {\lambda_1, \lambda_2, \lambda_3} contains both positive and negative numbers if they are meant to be risk premiums?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii. Regarding the feeding of interest rate to the equity return model, what exactly is the rate ( r ) which passes through to the drift term for each simulation of the equity return if the process is not stochastic-on-stochastic?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Tim Finnegan</td>
<td>Q&amp;A Section F</td>
<td>Comment</td>
<td>Yes</td>
<td>ESG Common Comment Themes Presentation, LAITF 4/8/21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q3: # of projected periods for scenarios</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For most stochastic projections we prefer at least 40 years of stochastic scenarios. For certain product line testing, 65 year projections are used.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Tim Finnegan</td>
<td>Related: SERT scenarios</td>
<td>Comment</td>
<td>Yes</td>
<td>ESG Common Comment Themes Presentation, LAITF 4/8/21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The exposed set of SERT scenarios extended for 30 years. We feel the projection period output for SERT scenarios needs to be even longer than what is reasonable for most stochastic projections because a section of VM-20 calls for projecting &quot;cash flows for a period that extends far enough into the future so that no obligations remain.&quot; For this purpose, a 100 year projection period should suffice.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the graph "Equity Equation – Impact of Jumps" on page 10 of the ppt slides, the projected cumulative wealth factors from AIRG and GEMS at the end of the 30th year can be approximated by the line

\[ \text{AIRG cumulative wealth factor} = 1.3082 \times \text{GEMS cumulative wealth factor} + 1.4558 \]

For example, if GEMS cumulative factor is 4500%, the AIRG cumulative factor is approximately 6000%. Please explain the driver(s) which cause AIRG's cumulative wealth factor being significantly higher than GEMS's cumulative factor. Given that the title of the slide is "Equity Equation – Impact of Jumps," is the difference in wealth factors attributable to the assumed jumps? If not, why?

### Question

**Q4**

In the first page of the ppt slides "Equity Equation," the differential equation is listed as follow:

\[ \frac{dS(t)}{S(t)} = (r(t) - D(t)) + \mu_0 + \mu_1 V(t) - \lambda m V(t) dt + \sigma V(t) dW_1(t) + \gamma dN(t) \]

As the jump parameters \( \mu_1 \) and \( V(t) \) are positive and \( m \) is negative in page 8, the drifting factor due to the jump parameters is negative. Does it mean that the jump parameters would reduce the drifting factor for the equity return?

### Question

**Q5**
Society of Actuaries
Research Update to LATF

R. DALE HALL, FSA, MAAA, CERA, CFA
Managing Director of Research
April 8, 2021

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Group Life COVID-19 Mortality Survey

• Survey of claims experience of 20 of top 21 U.S. Group Term Life insurers during the COVID-19 pandemic
• Data through October 2020 (report to be updated in June)
• Measured overall excess mortality and portion of excess mortality due to COVID
• Analyzed results by geographic region, industry, and against the U.S. population as a whole
  • https://www.soa.org/resources/experience-studies/2020/group-life-covid-mort-survey/
Group Life COVID-19 Mortality Survey

• Survey Highlights
  • Q2 & Q3 2020 incurred incidence compared to corresponding quarters of 2017-2019
    • By count: 12.9% increase
    • By amount: 23.8% increase
    • 16,740 COVID claims, totaling $662 million
  • Q2 & Q3 2020 reported incidence compared to corresponding quarters of 2017-2019
    • By count: 8.5% increase
    • By amount: 20.1% increase
    • 14,513 COVID claims, totaling $564 million

Group Life COVID-19 Mortality Survey

• Survey Highlights
  • 8% of all reported Group Life claims with death dates in April-August 2020 were determined to have a cause of death of COVID-19
  • Blue Collar group has seen the smallest increase in mortality (monthly 3% - 10%). White Collar and Grey Collar have had higher increases (monthly 10% - 30%)
  • Regional patterns have changed over time
    • Northeast region affected greatest in Q2
    • Southeast region affected greatest in Q3
  • Percentage of Group Life excess deaths approximately 50% - 70% of the percentage of U.S. population excess deaths
Individual Life COVID-19 Claims Analysis

- **Data**
  - 27 companies’ experience
  - 55% industry
  - 2.5 million claims from 2015 through Q2 2020; 239k in 2020, 11.6k COVID claims

- **Analyses**
  - 2020 Q1 & Q2 actual claims vs average of 2015-2019 experience
    - Attained age, sex, region, underwriting class, smoker status, face amount, cause of death
  - 2020 Q1 & Q2 actual claims vs U.S. population
    - Attained age, sex, region, cause of death
  - [https://www.soa.org/resources/experience-studies/2021/us-individual-life-covid-19/](https://www.soa.org/resources/experience-studies/2021/us-individual-life-covid-19/)

U.S. Individual Life COVID-19 Mortality Claims Analysis

© 2021 National Association of Insurance Commissioners
Individual Life Mortality Claims Analysis – Some Highlights

- **Overall Actual to Expected**
  - Similar ratios in 2020 Q1
  - Individual life lower in 2020 Q2

- **Average Age @ Death**
  - Individual life is older
  - COVID vs non-COVID greater in population

### Underwriting Class Actual to Expected
- Preferred A/E > other classes at older ages

<table>
<thead>
<tr>
<th>Actual to Expected</th>
<th>Individual Life</th>
<th>U.S. Population (excess death)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 Q1</td>
<td>93-99%</td>
<td>97-101%</td>
</tr>
<tr>
<td>2020 Q2</td>
<td>110-113%</td>
<td>118-123%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Age @ Death</th>
<th>Individual Life</th>
<th>U.S. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID claims</td>
<td>79.5</td>
<td>76.1</td>
</tr>
<tr>
<td>Non-COVID claims</td>
<td>78.9</td>
<td>73.1</td>
</tr>
</tbody>
</table>

### US Population Mortality

© 2021 National Association of Insurance Commissioners
2020 Excess Deaths in the US General Population by Age and Sex

- Expands on CDC excess death analysis
  - shows results by age group and sex breakdowns
- Enables better comparisons of population to insured experience
  - Can now adjust for age/sex differences
★ Interesting finding: Ages 35-54 have the highest actual/expected values
  - https://www.soa.org/resources/research-reports/2021/excess-deaths-gen-population/

<table>
<thead>
<tr>
<th>Age</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>92.8%</td>
<td>90.6%</td>
</tr>
<tr>
<td>1-4</td>
<td>86.8%</td>
<td>94.2%</td>
</tr>
<tr>
<td>5-14</td>
<td>94.1%</td>
<td>104.6%</td>
</tr>
<tr>
<td>15-24</td>
<td>117.0%</td>
<td>123.1%</td>
</tr>
<tr>
<td>25-34</td>
<td>116.6%</td>
<td>120.4%</td>
</tr>
<tr>
<td>35-44</td>
<td>122.0%</td>
<td>126.9%</td>
</tr>
<tr>
<td>45-54</td>
<td>121.0%</td>
<td>126.9%</td>
</tr>
<tr>
<td>55-64</td>
<td>114.9%</td>
<td>119.7%</td>
</tr>
<tr>
<td>65-74</td>
<td>119.1%</td>
<td>121.4%</td>
</tr>
<tr>
<td>75-84</td>
<td>119.9%</td>
<td>122.2%</td>
</tr>
<tr>
<td>&gt; 84</td>
<td>118.4%</td>
<td>118.4%</td>
</tr>
<tr>
<td>All Ages</td>
<td>118.4%</td>
<td>120.9%</td>
</tr>
</tbody>
</table>

Actual to Expected Deaths: Mar 22, 2020 to Dec 26, 2020 as of Feb 03, 2021

U.S. Population Mortality Observations – Updated with 2019 Experience

- 1.2% annual improvement in 2019
★ New feature - Results by 5 socioeconomic groups
- Cause of death analyses
  - https://www.soa.org/resources/research-reports/2021/us-population-mortality/
## SOA Experience Studies

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Objective</th>
<th>Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2007 Post Level Term Mortality and Lapse - Report</td>
<td>Complete a study of mortality and lapse on term policies in the post level premium period.</td>
<td>4/30/2021</td>
</tr>
<tr>
<td>2000-2007 Post Level Term Mortality and Lapse - Machine Learning Report</td>
<td>Draft a report regarding the PLT machine learning analysis that was done; this report will supplement the main report.</td>
<td>4/30/2021</td>
</tr>
<tr>
<td>2019-16 Individual Life Mortality Study</td>
<td>Complete the next in a series of experience analysis of individual ordinary life insurance mortality.</td>
<td>4/30/2021</td>
</tr>
<tr>
<td>2018 Variable Annuity Guaranteed Living Benefit Utilization Study</td>
<td>Examine the utilization of guaranteed living benefit options on variable annuity policies under a Joint SOA/LIMRA project.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Group Life COVID-19 Mortality Survey Update - Report</td>
<td>Develop an update on a mortality study assessing the impact of COVID-19 on Group life insurance.</td>
<td>6/15/2021</td>
</tr>
<tr>
<td>2000-2011 LTC Lapse and Mortality Valuation Assumptions</td>
<td>Develop a replacement mortality LTC valuation table and a proposal to replace the current LTC voluntary lapse parameters. Work done in conjunction with the AAA.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Mortality Improvement Survey</td>
<td>Complete a survey to learn how companies are reacting to the slowdown in the level of mortality improvement within the general population.</td>
<td>6/30/2021</td>
</tr>
</tbody>
</table>

2. [https://www.soa.org/resources/research-reports/2021/emerging-issues-underwriting-survey/](https://www.soa.org/resources/research-reports/2021/emerging-issues-underwriting-survey/)
### SOA Practice Research & Data Driven In-house Research

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Objective</th>
<th>Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance Policies on Human Genetics Primer</td>
<td>Draft a primer paper that discusses the issues surrounding human genetics and how they are and will impact the insurance industry.</td>
<td>Complete: On SOA web site.</td>
</tr>
<tr>
<td>US Mortality by Socioeconomic Category - Update</td>
<td>Update the set of detailed life tables by socioeconomic category across all U.S. counties.</td>
<td>Complete: On SOA web site.</td>
</tr>
<tr>
<td>Complex Model Evaluation</td>
<td>Review existing literature on GLMs, discuss actuarial standards for using complex models outside of actuary's initial expertise, develop case studies for demonstrating methods of evaluating the validation of complex mortality models.</td>
<td>4/30/2021</td>
</tr>
<tr>
<td>Human Mortality Database - 2019 Projects</td>
<td>Enhance the Human Mortality Database by focusing on state level mortality tables and expanding causes of death mortality tables for more countries.</td>
<td>4/30/2021</td>
</tr>
<tr>
<td>InsurTech White Paper</td>
<td>Write a white paper covering the InsurTech landscape in the U.S. and discuss how actuaries will be impacted.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Modelling and Forecasting Cause-of-Death Mortality by Socio-Economic Factors</td>
<td>Develop a mortality projection model to analyse and forecast mortality by cause of death and socio-economic factors.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Deep Learning for Liability-Driven Investments</td>
<td>Explore the possibility of using deep learning and reinforcement learning techniques to improve investment decision-making for pension funds and life insurance companies.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Managing Investment Risks of Insurance/Annuity Contractual Designs</td>
<td>Develop a framework for quantifying and analyzing various forms of contractual designs and their risk management techniques.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>2020 Emerging Risks Survey - Final Report</td>
<td>Track the trends and thoughts of risk managers on emerging risks across time.</td>
<td>6/30/2021</td>
</tr>
<tr>
<td>Predictive Analytics for Early Detection of Insurer Insolvency</td>
<td>Develop a market-based insolvency prediction model to detect financially distressed insurers at an early stage.</td>
<td>6/30/2021</td>
</tr>
</tbody>
</table>

*Notes:*
- [https://www.soa.org/resources/research-reports/2021/20th-emissary-survey/](https://www.soa.org/resources/research-reports/2021/20th-emissary-survey/) (Due: 4/30/21)
- [https://www.soa.org/resources/research-reports/2021/excess-deaths-gen-population/](https://www.soa.org/resources/research-reports/2021/excess-deaths-gen-population/) (Due: 4/30/21)
- [https://www.soa.org/resources/research-reports/2022/primer-on-policies-genetics/](https://www.soa.org/resources/research-reports/2022/primer-on-policies-genetics/) (Due: 4/30/21)
- [https://www.soa.org/resources/research-reports/2020/us-mortality-rate-socioeconomic/](https://www.soa.org/resources/research-reports/2020/us-mortality-rate-socioeconomic/) (Due: 4/30/21)
Life Practice Council Update

Laura Hanson, MAAA, FSA
Vice President

Life Actuarial Task Force Meeting—April 8, 2021

Agenda

- Recent Activities
- Current Activities
- Ongoing Activities
Recent Activities

- Hosted 2020 year-in-review webinar
- Published 2021 *Life & Health Valuation Law Manual*
- Created six principle-based reserving (PBR) analysis templates
  - Additional content on Academy PBR webpage
    https://www.actuary.org/content/pbr-practice
- Published PBR In Brief (VM-22)

Recent Activities (continued)

- Updated C-1 bond factors with new tax rate
- Created Fixed Annuity PBR Deviations Grid
- Submitted comment letters on:
  - Economic scenario generator (LATF)
  - C-1 real estate factors (LRBC)
  - Colorado Senate Bill 21-169 (Senator Buckner)
Current Activities

- VM-21 Practice Note Addendum exposed for comment through April 30
- VM-22 drafting underway; expected in Q2 2021
- VM-22/C-3 P1 field study in development

Current Activities (continued)

- COVID-19 webinar planned for May
- PBR Boot Camp June 7–9
  - Registration is open!
  - Agenda
    - Day One: External reviews of PBR, model overview and model governance, and reserve change analysis and pricing projections.
    - Day Two: Overviews of life insurance—implementation of VM-20, mortality, additional liability assumption, and reinsurance.
    - Day Three: Asset overview, standard projection methodology, and sample reports.
Ongoing Activities

- Support Economic Scenario Generator transition
- Coordinate VM-22 and C-3 field study for non-variable annuities
- Recommend C-2 mortality factors
- Provide analysis of C-1 bond factors, C-1 real estate factors, and C-2 longevity factors

Ongoing Activities (continued)

- Provide commentary on mortality improvement discussions
- Support Yearly Renewable Term (YRT) reinsurance approach for VM-20
- Propose VM-51 data elements
- Publish Life Illustrations Practice Note Addendum
- Publish FAQs on changes to tax reserve calculations and reporting under TCJA (federal tax law)
Ongoing Activities (continued)

- Provide public policy analysis on the use of annuities in retirement plans, including changes as a result of the SECURE Act
- Provide public policy analysis on the use of data and algorithms in risk classification and underwriting
- Provide public policy analysis on efforts to promote diversity and inclusion in the actuarial profession and the broader insurance industry

Thank You

- Questions?
- For more information, please contact the Academy’s Life Policy Analyst, Khloe Greenwood, at greenwood@actuary.org.
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.
   
   Identification:  
   Dany Provencher, Appointed Actuary, Industrial Alliance group of companies

   Title of the issue:  
   Asset collar when modeled reserve is negative

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:  

   VM-20 Section 7.D.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.)

   If for all model segments combined, the aggregate annual statement value of the final starting assets, less the corresponding PIMR balance, is
   (a) less than 98% of the modeled reserve; or
       (i) 98% of the modeled reserve if modeled reserve is positive;
       (ii) 102% of the modeled reserve if modeled reserve is negative; or
   (b) greater than the largest of:
       (i) 102% of the modeled reserve;
       (ii) the NPR for the same set of policies, net of due and deferred premiums thereon: and
       (iii) zero,

   then the company shall provide documentation in the PBR Actuarial Report that provides reasonable assurance that the modeled reserve is not materially understated as a result of the estimate of the amount of starting assets.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

   If modeled reserve is negative, using assets corresponding to 100% of modeled reserve, would not fall within the asset collar.

* 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.
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 – edits adopted changes to VM-02 for improved clarity and to remove potential circularity.

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, 2021 edition), VM-02 Section 3.A

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.)

   Subsequent the adopted changes to the federal tax code (IRC S. 7702), this proposed change would clarify the language in the previously adopted edits to VM-02 to avoid any potential circularity.

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Valuation Manual VM-02

Section 3: Interest

A. The nonforfeiture interest rate for any life insurance policy issued in a particular calendar year beginning on and after the operative date of the Valuation Manual shall be equal to 125% of the calendar year statutory valuation interest rate defined for the NPR in the Valuation Manual for a life insurance policy with nonforfeiture values, whether or not such sections apply to such policy for valuation purposes, rounded to the nearer one-quarter of 1%, provided, however, that the nonforfeiture interest rate shall not be less than the Applicable Accumulation Test Minimum Rate in the Cash Value Accumulation Test under Section 7702 (Life Insurance Contract Defined) of the U.S. Internal Revenue Code.

Guidance Note: For flexible premium universal life insurance policies as defined in Section 3.D of the Universal Life Insurance Model Regulation (#585), this is not intended to prevent an interest rate guarantee less than the nonforfeiture interest rate.
Life Actuarial (A) Task Force
Amendment Proposal Form 2021-03
Exposed for a 21-day public comment period ending May 3, 2021

The proposed guidance note presumes that Section 6.C.5.n refers to how cohorts and weights are unaffected by changes in interest rates at each reporting date because the discount rate for the calculations is fixed, but it indicates that periodic updates to underlying prescribed assumptions may require recalculations. LATF is requesting comments on this interpretation and its applicability to this RMD change vs. Standard Projection assumption updates more broadly.

Please submit comments to Reggie Mazyck (RMazyck@naic.org) by COB 5/3/21.
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.

American Academy of Actuaries, Variable Annuity Reserves & Capital Work Group

Update the reference to the required minimum distribution (RMD) age in the VM-21 Standard Projection Amount for the Setting Every Community Up for Retirement Enhancement (SECURE) Act change.

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:

January 1, 2021, version of the Valuation Manual

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.)

In VM-21, Section 6.C.5:

i. For tax-qualified contracts, add the following to the revised GAPV² corresponding to an initial withdrawal age of ≥ the federal required minimum distribution (RMD) age.

\[
0.50 \times \begin{cases} 
0.95 - \sum_{i = Initial\ WD\ Age}^{Initial\ WD\ Age} GAPV^2_{\text{Adjusted, Scaled}}, & \text{if contract is a tax - qualified GMWB} \\
0.85 - \sum_{i = Initial\ WD\ Age}^{Initial\ WD\ Age} GAPV^2_{\text{Adjusted, Scaled}}, & \text{if contract is a tax - qualified hybrid GMIB}
\end{cases}
\]

j. Scale the revised GAPV² values at all future initial withdrawal ages—i.e., all ages greater than the federal required minimum distribution (RMD) age, as identified in the preceding step—such that the sum of the revised GAPV² values equals 0.95 for tax-qualified GMWB contracts and 0.85 for tax-qualified hybrid GMIB contracts again.

n. The cohorts and their associated weights as determined in Section 6.C.5.a through Section 6.C.5.k are for a contract with attained age equal to its issue age. Because the discount rate used in this determination is fixed, generally these calculations only need to be performed once for a given set of contracts with a certain issue age, guaranteed benefit product, and tax status.

Guidance Note: Cohorts and their associated weights may need to be revised if prescribed assumptions are updated.

4. State the reason for the proposed amendment? (You may do this through an attachment.)
The Standard Projection’s withdrawal delay cohort method includes an adjustment at the required minimum distribution (RMD) age. The SECURE Act changed the RMD age from 70.5 to 72. This proposed amendment implements the change by directly referencing the RMD age. The direct reference will reduce Valuation Manual maintenance for any future changes.

The proposed guidance note presumes that Section 6.C.5.n refers to how cohorts and weights are unaffected by changes in interest rates at each reporting date because the discount rate for the calculations is fixed, but it indicates that periodic updates to underlying prescribed assumptions may require recalculation. LATF is requesting comments on this interpretation and its applicability to this RMD change vs. Standard Projection assumption updates more broadly.

* 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:

W:\National Meetings\2010\...\TF\LHA\
March 26, 2021

Mr. Mike Boerner  
Chair, NAIC Life Actuarial Task Force

Re: APF 2020-12

Dear Mike:

Nationwide appreciates the opportunity to comment on APF 2020-12 regarding Clearly Defined Hedging Strategies (CDHS). We are supportive of the goals of this APF to:

1. Create consistency in the hedging requirements across chapters within the Valuation Manual (VM), and  
2. Encourage more consistent inclusion of hedging strategies within the VM calculation requirements.

The APF accomplishes its goals by moving hedging definitions to VM-01 and by including the newly defined Seasoned Hedging Strategies (SHS) in the VM requirements.

On page 2 of the APF in the “State the reason for the proposed amendment” section the concept of the SHS is given as:

“To accomplish this, the proposal requires that any hedging strategy that is a part of the investment strategy supporting the policies and is normally modeled as part of the company’s risk assessment and evaluation processes be modeled as if it were a CDHS if doing so results in an increase in life reserves or variable annuity TAR.”

However, the proposed definition of SHS in the APF uses slightly different language as follows:

“The term “Seasoned Hedging Strategy” (SHS) means a hedging strategy that is part of the company’s investment strategy and is normally modeled as part of the company’s risk assessment and evaluation process. A SHS may or may not be a CDHS.”

We prefer the SHS definition given on page 2 of the APF as it clearly indicates that the hedging strategy needs to be part of the investment strategy which supports the policies subject to the VM calculation requirements. We would recommend changing the SHS definition to be consistent with the language given on page 2 of the APF.

In addition, our interpretation of this APF is that it excludes company level “macro” hedges which we support. We believe that the page 2 SHS definition more clearly supports the exclusion of company level “macro” hedges from the VM calculation requirements. Company level “macro” hedges are meant to manage aggregate company level risks and not product specific risks. As such, we believe that it would not be appropriate to include them in product specific VM calculation requirements.

However, if the APF does intend to include company level “macro” hedges in the requirements, then we believe that the APF will need to be significantly expanded to include language on how this is to be accomplished. For example, how would these “macro” hedges be allocated to specific product calculation requirements across multiple chapters of the VM?
We appreciate your consideration of our comments.

Sincerely,

Philip Wunderlich, FSA, MAAA
Associate Vice President, Appointed Actuary
Nationwide Financial

Brian J. Wagner, FSA, MAAA
Associate Vice President, Actuary
Nationwide Financial

Jay Hines, FSA, MAAA
Senior Actuary, Annuity Valuation
Nationwide Financial

cc Reggie Mazyck, NAIC
    Pete Weber, Ohio Department of Insurance
Brian Bayerle  
Senior Actuary  

March 26, 2020  

Mr. Mike Boerner  
Chair, NAIC Life Actuarial Task Force (LATF)  

Re: APF 2020-12  

Dear Mr. Boerner:  

The American Council of Life Insurers (ACLI) appreciates the opportunity to submit the following comments on the exposed APF 2020-12. The APF seeks to align and consolidate hedging requirements across Valuation Manual sections, address a drafting note within VM-20, and eliminate perceived company optionality with regard to the reflection of hedging in PBR requirements.  

We support the goal of aligning and consolidating hedging requirements and are not opposed to addressing the VM-20 drafting note. We also acknowledge the legitimate regulatory concerns around perceived company optionality. At the same time, APF 2020-12 raises a number of questions and potential concerns. We believe that there is a lack of understanding among all parties of the industry’s hedging strategies, the way in which those hedging strategies are reflected in PBR modeling, and the intent and potential effects of the APF. At the extreme, we believe the APF could create a regulatory disincentive to undertake certain strategies and would lead to resource-intensive reconsideration of and revisions to hedging programs.  

We suggest that an important next step involves a broad survey of the industry’s hedging programs. The proprietary nature of hedging programs makes it difficult for the industry to collect the information about the strategies employed by the industry. Therefore, a regulator survey might be a preferable vehicle. The survey could explore the landscape of hedging programs, their intent, their treatment within PBR modeling, whether or not such programs are considered a CDHS (and if not, why not), and the potential impact of APF 2020-12. The survey itself would promote a consistent understanding of the APF and a mutual understanding of whether the APF would lead to unintended consequences.  

Regarding the understanding of the APF, our discussions have surfaced different interpretations of the language, which has potentially led to some misperceptions. For example, the phrase “normally modeled as part of a company’s risk assessment and evaluation processes” can be interpreted very broadly or narrowly. These varying interpretations have led to inconsistent understandings and interpretations of the impact of the APF among our member companies.
Because we believe there are potential unintended consequences with APF 2020-12, we believe that it may be beneficial to consider alternative solutions. ACLI believes once we have a greater mutual understanding we can work with regulators to develop an alternative that provides for enhanced regulatory oversight while addressing many of our concerns.

Finally, we would like to share the following preliminary concerns with APF 2020-12. Again, these concerns may reflect an incomplete understanding of the APF:

1. **It may create a disincentive to hedge**

   One of the crowning achievements of the new VA framework is that it has removed previous disincentives to hedge risks due to the non-economic nature of the statutory framework. APF 2020-12 might unfortunately move in the opposite direction by reintroducing non-economic disincentives into the framework. Under the proposal, hedges that are deemed to be an SHS may produce unreasonable results in statutory modeling. For SHS strategies, the company would be required to reflect the more adverse of the with-hedging and without-hedging results, thus eliminating any regulatory benefit of undertaking such a strategy. Because hedging inevitably comes with an attendant cost, the framework would effectively be signaling that insurers should not be undertaking SHS strategies. We believe that this is contrary to the interests of regulators, companies, and policyholders.

2. **It may create excessive complexity**

   APF 2020-12 could be interpreted to apply broadly to hedging strategies and, if implemented, could lead to significant questions and complications. Macro hedges might need to be allocated to the product level which could create significant practical challenges. Further, hedging programs that are established to manage statutory outcomes would lead to circularity, due to the interplay in the valuation of the reserve and the hedge. In addition, situations could arise in which multiple hedging programs would need to be reflected, creating additional layers of complexity and complication.

In addition, we believe the APF raises various other technical and practical questions. For instance, the APF is currently silent on treatment of reinsurance, which could affect how the requirements are interpreted and applied. In addition, the APF requires modeling a SHS if doing such increases the reserve but does not clarify the treatment if modeling a SHS decreases the reserve. Further to that point, if the intent is one-sided then the APF would create challenges as there would potentially be period-to-period changes in whether strategies should be reflected. This toggling would create new challenges for both companies and regulators.

We believe that industry and regulators may be better served by a different solution. Therefore, in addition to an improved understanding of the landscape of hedging programs, we believe that alternative proposals should be considered.
We appreciate the consideration of our comments and look forward to discussing on a future call. Thank you.

Sincerely,

cc: Reggie Mazyck, NAIC
March 26, 2021

Reggie Mazyck  
National Association of Insurance Commissioners  
1100 Walnut Street – Suite 1500  
Kansas City, MO  64106-2197

Re: APF 2020-12, CDHS

I appreciate the opportunity to provide comments on the Amendment Proposal Form 2020-12 submitted by Rachel Hemphill and Karen Jiang of the Texas Department of Insurance.

After 15 years, it would be nice if we could eliminate the CDHS concept as it was first introduced with C3-Phase II as a temporary measure until the regulators could become comfortable with the inclusion of hedge strategies that could potentially reduce capital requirements.

Since it appears the regulators are not quite ready to remove this requirement, it is important that the changes being made continue to move us closer to a principal-based approach as opposed to implementing additional regulatory restrictions and confusion as to what the valuation manual says and what is intended by the changes.

Although my preference is to remove the CDHS concept from the valuation manual, I believe the overall reason for the proposed amendment is fine. And although I generally agree conceptually with the proposal, I disagree with the changes proposed and the introduction of now another term “Seasoned Hedging Strategy”.

Theoretically, under a principle-based approach, the company should be reflecting how it is managing and how it intends to manage the assets and liabilities being modeled. This includes the investment strategy irrespective of the instruments being used. To the extent that regulators want to limit credit for certain activities, that is fine, but they need to articulate (devise rules) on what those activities are.

What does “a strategy undertaken by a company to manage risks through the future purchase or sale of hedging instruments” really mean?

So what activities constitute hedging? Can this be adequately and appropriately defined? Is the purchase of a 100-year bond as part of the company’s investment strategy also subject to CDHS requirements? Is a 100-year bond a hedging instrument? What about floating rate bonds? Would
this be exempt from a CDHS but if a fixed income bond was purchased and swapped for floating, the CDHS requirements would need to be met?

We need to remember, that CDHS was first introduced where the line between investment strategy and hedging was easier to draw because 15 years ago the strategies employed for variable annuities were distinctive and easily identified. As we move to cover more product types from fixed life and annuities to equity-indexed life and annuities to structured annuities, the distinction between investment strategy and hedging gets harder to distinguish.

For this reason, I prefer to move closer to a principle-based approach that reflects the investments the company has and anticipates to have in the future with disclosure as to the strategies employed and the risks involved.

With respect to CDHS if we retain the concept I would propose:

a. The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
b. The hedge objectives.
c. The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
d. The financial instruments used to hedge the risks.
e. The hedge trading rules, including the permitted tolerances from hedging objectives.
f. The metrics, criteria, and frequency for measuring hedging effectiveness.
g. The criteria used to measure hedging effectiveness.
h. The frequency of measuring hedging effectiveness.
i. The conditions under which hedging will not take place.
j. The person or persons responsible for implementing the hedging strategy.
k. Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
l. The circumstances under which hedging strategy will not be effective in hedging the risks.
m. Discussion of primary risks associated with the strategy employed.

As to the items I propose removing; in general, I think it is hard to document infinite lists such as what risk are not hedged, conditions when hedging will not take place, and circumstances under which the hedging strategy will not be effective in hedging the risks. I do agree that as much information about the strategy should be discussed, and therefore propose discussion of the risks, but I do not believe endless lists are appropriate or should be required.

As to person or persons responsible for “implementing” the hedging strategy, do you really mean “executing” the hedging strategy? I would claim this is the company’s responsibility and the “person or persons” is irrelevant and will quickly become stale in the documentation of strategies.

Lastly, areas where basis, gap or assumption risk has been identified. For variable annuities this should all be part of documenting and quantifying CTE(Best-efforts) versus CTE(Adjusted). From VM-21, Section 9.B.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 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.).”

I believe this alternative is conceptually consistent with the objectives of the APF. Disclosure of investment strategies and risks are required and more conservative assumptions can be used if they produce a greater reserve or capital requirement. (I.e. Disclosure of CDHS items is required to reduce requirement.) If we keep the CDHS terminology we still need to make sure we can articulate when is a strategy subject to these CDHS requirements. Is it only when we utilize hedge accounting? Is it only when derivatives (excluding mortgage derivatives) are used? Is it only when the variability of potential outcomes exceeds a specific tolerance (i.e. strategies with greater uncertainty)? However, I believe this moves us closer to a principle-based approach and therefore will be more robust and infuse less confusion in the modeling of investments and strategies for a variety of products.

Sincerely,

William H. Wilton, CFA, FSA, MAAA
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.

   **Identification:**
   Rachel Hemphill and Karen Jiang, Texas Department of Insurance

   **Title of the Issue:**
   Create consistency between CDHS determination in VM-20 and VM-21. Revise hedge modeling to only require CDHS if modeling future hedging reduces the reserves under VM-20 or TAR under VM-21.

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:


   January 1, 2021 NAIC Valuation Manual

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.)

   **Summary of 4/2/2021 Updates:**
   1. Revisions were made to VM-20 Section 7.K.4 (add “supporting the policies”) and VM-21 Section 9.A.6 (add “supporting the contracts”) in response to Nationwide’s comments.
   2. We added a definition for “hedging transactions,” taken from the APPM but modified slightly to be consistent with Valuation Manual terminology in response to Will Wilton’s comments.
   3. We have updated the list of CDHS criteria in response to Will Wilton’s comments where we agreed:
      a. Added “significant” before risks in item (c) of the CDHS definition.
      b. Combined items (f) – (h) in the CDHS definition.
      c. Change “person or persons” to “group or area, including whether internal or external,” in item (j) of the CDHS definition.
      d. We did not remove items (k) or (l) as suggested by Will Wilton, as we find this information useful to regulators. Given that these are retained, and because we were uncertain what else would be included in the new “primary risks” item suggested by Will Wilton, we have not added it. If we can be provided additional information on the risks to be reflected under this new item, an edit could be made.
   4. We modified the definition of a SHS to clarify “normally modelled” in response to the ACLI comment and clarify what may be a SHS in response to Will Wilton’s comment (e.g., a single bond would not be a SHS).
We propose having consistent requirements for a CDHS in VM-20 and VM-21, as well as any future work on VM-22, and consolidating these requirements in the VM-01 definition of a CDHS. This involves adding two criteria to VM-21’s definition of CDHS that currently exist for VM-20:

- Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
- The circumstances under which hedging strategy will not be effective in hedging the risks.

These criteria are both reasonable and apply in principle to VM-21, and to any future work on VM-22, as well as VM-20.

Further, we propose revising the requirement for hedging to be a CDHS in order for future hedging to be modeled under VM-20, VM-21, and LR027’s C-3 RBC Amount calculation to only apply when modeling such hedging reduces the life reserve level or variable annuity Total Asset Requirement (TAR) level.

The current regulatory requirements for hedging to be a CDHS in order for future hedging to be modeled under VM-20, modeled under VM-21, and modeled for the C-3 RBC Amount calculation for variable annuities, and to be eligible for SSAP 108 treatment are all logical requirements when one considers whether hedging should be allowed to reduce the life reserve level or variable annuity TAR level, or whether any mismatch between movements in hedge assets and movements in the corresponding reserve levels should be allowed to be amortized over time.

However, this same requirement has led to a situation of there being unintended optionality in whether a hedging strategy that is like a CDHS is modeled or is not modeled, since a company may choose to satisfy or not satisfy certain of the criteria. This has been especially relevant for cases where modeling a company’s hedging strategy would increase reserves or variable annuity TAR.

As noted in the current guidance note in VM-20 Section 7.K.1 in the 2021 Valuation Manual:

“The prohibition in these modeled reserve requirements against projecting future hedging transactions other than those associated with a clearly defined hedging strategy is intended to address initial concerns expressed by various parties that reserves could be unduly reduced by reflection of programs whose future execution and performance may have greater uncertainty. The prohibition appears, however, to be in conflict with Principle 2 listed in VM-21. Companies may actually execute and reflect in their risk assessment and evaluation processes hedging strategies similar in many ways to clearly defined hedging strategies but lack sufficient clarity in one or more of the qualification criteria. By excluding the associated derivative instruments, the investment strategy that is modeled may also not reflect the investment strategy the company actually uses. Further, because the future hedging transactions may be a net cost to the company in some scenarios and a net benefit in other scenarios, the exclusion of such transactions can result in a modeled reserve that is either lower or higher than it would have been if the transactions were not excluded. The direction of such impact on the reserves could also change from period to period as the actual and projected paths of economic conditions change. A more graded approach to recognition of non-qualifying hedging strategies may be more theoretically consistent with Principle 2. It is recommended that as greater experience is gained by actuaries and state insurance regulators with the principle-based approach and as industry hedging programs mature, the various requirements of this section be reviewed.”

We propose to continue addressing the regulatory concern that reserves could be unduly reduced by reflection of programs whose future execution and performance may have greater uncertainty, by continuing to only allowing hedging strategies that qualify as a CDHS to reduce life reserves and variable annuity TAR. However, we propose that the treatment of CDHS be made more principles-based and less...
subject to manipulation. To accomplish this, the proposal requires that any hedging strategy that is a part of the investment strategy supporting the policies and is normally modeled as part of the company's risk assessment and evaluation processes be modeled as if it were a CDHS if doing so results in an increase in life reserves or variable annuity TAR.

That is, CDHS becomes a requirement solely for hedging strategies that reduce life reserves or variable annuity TAR, and so becomes a more clear regulatory guardrail requiring that hedging strategies that reduce life reserves or variable annuity TAR must be clearly defined.

We continue to need the concept of a CDHS. A CDHS simply formally documents items that a company should be able to document for a robust, well-defined hedging strategy. It requires that the following be identified:

a. The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
b. The hedge objectives.
c. The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
d. The financial instruments used to hedge the risks.
e. The hedge trading rules, including the permitted tolerances from hedging objectives.
f. The metrics for measuring hedging effectiveness.
g. The criteria used to measure hedging effectiveness.
h. The frequency of measuring hedging effectiveness.
i. The conditions under which hedging will not take place.
j. The person or persons responsible for implementing the hedging strategy.
k. Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
l. The circumstances under which hedging strategy will not be effective in hedging the risks.

While the last two criteria have historically applied for life but not variable annuities, these are all reasonable documentation items that for a robust, well-defined hedging strategy regardless of whether the product is life or variable annuity.

The concept of a CDHS is used for accounting in SSAP 108. SSAP 108 allows companies to set up a deferred asset or liability to amortize the mismatch between changes in the value of the liability and changes in the value of the hedging instruments attributable to the hedged risk underlying a highly effective CDHS modeled for VM-21. Allowing this treatment encourages companies to reduce risk through robust, well-defined and highly effective hedging. Without having the hedging strategy be well-defined, regulators could not rely on past effectiveness being indicative of future effectiveness, and so could not offer companies the benefit of SSAP 108 treatment. Once we recognize the need for a concept of a well-defined hedging strategy, the only question is what criteria would need to be met to be considered well-defined – that is, what criteria should be required to be considered a CDHS. This is a distinct question from whether the concept of a CDHS is needed. We have not heard critiques of individual criteria in the CDHS definition, but consideration of the criteria is appropriate as we go forward to make the definitions in VM-20 and VM-21 consistent. Similarly, in reserve and capital calculations, we rely on the concept of historical effectiveness to determine an error factor. If modeling hedging reduces the reserve or capital amount, the error factor determines the magnitude to which this is reflected. However, this use of the historical effectiveness relies on the hedging strategy being well-documented and comparable between historical hedging and planned future hedging. So, again, a need for hedging strategies to be well-defined presents itself – a CDHS concept is needed.

Finally, edits to VM-31 are needed to reflect these updates and bring VM-20 and VM-21 reporting requirements more in line with one another where appropriate.

Note on Coordination with RBC and APPM: We have reviewed, and with these edits there are no corresponding edits necessary for LR027 for RBC but corresponding edits are necessary for SSAP 108. A referral to SAPWG is to be concurrently considered with this APF.
VM-01

The term “clearly defined hedging strategy” (CDHS) means a strategy undertaken by a company to manage risks through the future purchase or sale of hedging instruments and the opening and closing of hedging positions. A CDHS must identify:

a. The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
b. The hedge objectives.
c. The significant risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
d. The financial instruments used to hedge the risks.
e. The hedge trading rules, including the permitted tolerances from hedging objectives.
f. The metrics, criteria, and frequency for measuring hedging effectiveness.
g. The conditions under which hedging will not take place.
h. The group or area, including whether internal or external, responsible for implementing the hedging strategy.
i. Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
j. The circumstances under which hedging strategy will not be effective in hedging the risks.

The hedge strategy may be dynamic, static or a combination thereof. A strategy involving the offsetting of the risks associated with products falling under the scope of different requirements within the Valuation Manual (e.g., VM-20, VM-21, or VM-22) does not qualify as CDHS. A CDHS must meet all of the principles outlined in VM-21 Section 1.B (the most relevant of which may be Principle 5).

Guidance Note: For purposes of the above criteria, “effectiveness” need not be measured in a manner as defined in SSAP No. 86—Derivatives in the AP&P Manual.

The term “hedging transaction” means a derivative(s) transaction which is entered into and maintained to reduce:

a. The risk of a change in the fair value or cash flow of assets and liabilities which the company has acquired or incurred or has a firm commitment to acquire or incur or for which the company has a forecasted acquisition or incurrence; or
b. The currency exchange rate risk or the degree of foreign currency exposure in assets and liabilities which the company has acquired or incurred or has a firm commitment to acquire or incur or for which the company has forecasted acquisition or incurrence.

The term “Seasoned Hedging Strategy” (SHS) means a hedging strategy that is part of the company’s investment strategy and for which future hedging transactions are normally modeled as part of the company’s risk assessment and evaluation process. A SHS may or may not be a CDHS.

The hedge strategy may be dynamic, static, or a combination thereof. A strategy involving the offsetting of the risks associated with products falling under the scope of different requirements within the Valuation Manual (e.g., VM-20, VM-21, or VM-22) does not qualify as SHS. A SHS must meet all of the principles outlined in VM-21 Section 1.B (the most relevant of which may be Principle 5).
VM-20 Section 6.A.1.b

A company may not exclude a group of policies for which there is one or more CDHS or one or more SHS required to be modeled pursuant to Section 7.K.4 from stochastic reserve requirements, except in the case where all CDHS and all SHS required to be modeled pursuant to Section 7.K.4 are solely associated with product features that are determined to not be material under Section 7.B.1 due to low utilization.

VM-20 Section 7.E.1.g

Notwithstanding the above requirements, the modeled reserve shall be the higher of that produced by the model 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 model 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 50% PBR credit rating 6 (A2/A) and 50% PBR credit rating 3 (Aa2/AA).

Policy loans, equities and derivative instruments associated with the execution of a CDHS (in compliance with the definition of CDHS in VM-0) or a SHS that is required to be modeled pursuant to Section 7.K.4 are not affected by this requirement.

VM-20 Section 7.K

K. Modeling of Derivative Programs

1. When determining the deterministic reserve and the stochastic reserve, the company shall include in the projections the appropriate costs and benefits of derivative instruments that are currently held by the company in support of the policies subject to these requirements. The company shall also include the appropriate costs and benefits of anticipated future derivative instrument transactions associated with the execution of a CDHS or a SHS that is required to be modeled pursuant to Section 7.K.4, as well as the appropriate costs and benefits of anticipated future derivative instrument transactions associated with non-hedging derivative programs (e.g., replication, income generation) undertaken as part of the investment strategy supporting the policies, provided they are normally modeled as part of the company’s risk assessment and evaluation processes.

2. For each derivative program that is modeled, the company shall reflect the company’s established investment policy and procedures for that program; project expected program performance along each scenario; and recognize all benefits, residual risks and associated frictional costs. The residual risks include, but are not limited to: basis, gap, price, parameter estimation and variation in assumptions (mortality, persistency, withdrawal, etc.). Frictional costs include, but are not limited to: transaction, margin (opportunity costs associated with margin requirements) and administration. For CDHS or SHS required to be modeled pursuant to Section 7.K.4, the company may not assume that residual risks and frictional costs have a value of zero, unless the company demonstrates in the PBR Actuarial Report that “zero” is an appropriate expectation.

3. In circumstances where one or more material risk factors related to a derivative program are not fully captured within the cash-flow model used to calculate CTE 70, the company shall reflect such risk factors by increasing the stochastic reserve as described in Section 5.E.

4. If a SHS supporting the policies is not a CDHS but modeling it would result in an increase to the company’s minimum reserve, then the company shall model the SHS as if it were a CDHS when calculating reserves under VM-20.
VM-20 Section 7.L (Remove entire Section 7.L)

Deleted: L. Clearly Defined Hedging Strategy

- A clearly defined hedging strategy must identify:
  - The specific risks being hedged (e.g., cash flow, policy interest credits, delta, rho, vega, etc.).
  - The hedge objectives.
  - The risks that are not hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.).
  - The financial instruments used to hedge the risks.
  - The hedge trading rules, including the permitted tolerances from hedging objectives.
  - The metrics for measuring hedging effectiveness.
  - The criteria used to measure hedging effectiveness.
  - The conditions under which hedging will not take place.
  - The person or persons responsible for implementing the hedging strategy.
  - Areas where basis, gap or assumption risk related to the hedging strategy have been identified.
  - The circumstances under which hedging strategy will not be effective in hedging the risks.
  - Hedging strategies involving the offsetting of the risks associated with other products outside of the scope of these requirements is not a clearly defined hedging strategy.

Guidance Note: For purposes of the above criteria, “effectiveness” need not be measured in a manner as defined in SSAP No. 86—Derivatives in the AP&P Manual.
VM-21 Section 1.D.2 (Delete entire definition and renumber subsequent sections VM-21 Section 1.D.3 and VM-21 Section 1.D.4)

VM-21 Section 4.A.4

Modeling of Hedges

a. For a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6:

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 with a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6, the detailed requirements for the modeling of hedges are defined in Section 9. The following paragraphs are a high-level summary and do not supersede the detailed requirements.

i. 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.

ii. The projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of the CDHS or the SHS that is required to be modeled pursuant to Section 9.A.6. 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 as the weighted average of two CTE70 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 no future hedge purchases. These are discussed in greater detail in Section 9. The stochastic reserve shall be the weighted average of the two CTE70 values, where the weights reflect the error factor (E) determined following the guidance of Section 9.C.4.

iii. The company is responsible for verifying compliance with CDHS requirements, or SHS requirements if required to be modeled pursuant to Section 9.A.6, and any other requirements in Section 9 for all hedging instruments included in the projections.
iv. The use of products not falling under the scope of these requirements (e.g., equity-indexed annuities) as a hedge shall not be recognized in the determination of accumulated deficiencies.

**VM-21 Section 4.D.4.b**

Notwithstanding the above requirements, the model 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 by substituting an alternative investment strategy in which all fixed income reinvestment assets are 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 50% PBR credit rating 6 (A2/A) and 50% PBR credit rating 3 (Aa2/AA).

Policy loans, equities and derivative instruments associated with the execution of a CDHS (in compliance with the definition of CDHS in VM-01) or a SHS that is required to be modeled pursuant to Section 9.A.6 are not affected by this requirement.

**VM-21 Section 6.B.3.a.ii – Footnote (Footnote at Bottom of Page 21-22)**

Throughout this Section 6, references to CTE70 (adjusted) shall also mean the Stochastic Reserve for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6 as discussed in Section 4.A.4.a.

**VM-21 Section 6.B.3.b.ii**

Calculate the Prescribed Projections Amount as the CTE70 (adjusted) using the same method as that outlined in Section 9.C (which is the same as the stochastic reserves following Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6) but substituting the assumptions prescribed by Section 6.C. The calculation of this Prescribed Projections Amount also requires that the scenario reserve for any given scenario be equal to or in excess of the cash surrender value in aggregate on the valuation date for the group of contracts modeled in the projection.

**VM-21 Section 6.B.5**

Cash flows associated with hedging shall be projected in the same manner as that used in the calculation of the CTE70 (adjusted) as discussed in Section 9.C or Section 4.A.4.a for a company without a CDHS or a SHS that is required to be modeled pursuant to Section 9.A.6.

**VM-21 Section 9**

Section 9: Modeling of Hedges under a CDHS

A. Initial Considerations

1. Subject to Section 9.C.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, determined in accordance with Section 3.D and Section 4.D.

2. If the company is following a CDHS, in accordance with an investment policy adopted by the board of directors, or a committee of board members, 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 based on the execution of the hedging strategy, and it is eligible to reduce the amount of the stochastic reserve using projections.
otherwise calculated. The investment policy must clearly articulate the company’s hedging objectives, including the metrics that drive rebalancing/trading. This specification could include maximum tolerable values for investment losses, earnings, volatility, exposure, etc. in either absolute or relative terms over one or more investment horizons vis-à-vis the chance of occurrence. Company management is responsible for developing, documenting, executing and evaluating the investment strategy, including the hedging strategy, used to implement the investment policy.

3. 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.

4. 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.

5. Before either a new or revised hedging strategy can be used to reduce the amount of the stochastic reserve otherwise calculated, the hedging strategy should be in place (i.e., effectively implemented by the company) for at least three months. The company may meet the time requirement by having evaluated the effective implementation of the hedging strategy for at least three months without actually having executed the trades indicated by the hedging strategy (e.g., mock testing or by having effectively implemented the strategy with similar annuity products for at least three months).

6. If a SHS supporting the contracts is not a CDHS but modeling it as if it were a CDHS would result in an increase in the company’s TAR, then the company shall model the SHS as if it were a CDHS when calculating reserves under AG43 and/or VM-21 and when calculating the C-3 RBC Amount under LR027. The company shall not treat the SHS as a CDHS for purposes of SSAP 109.

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 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.

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 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 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 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. Another example is that financial indices underlying typical hedging instruments typically do not perform exactly like the separate account funds, and hence the use of hedging instruments has the potential for introducing basis risk.

A safe harbor approach is permitted for CDHS reflection 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 (Reported)

1. The company shall calculate CTE70 (best efforts)—the results obtained when the CTE70 is based on incorporating the CDHS (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 CDHS (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 CDHS, therefore following the requirements of Section 4.A.4.a.

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 is given by:

   Stochastic reserve = CTE70 (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 at least the most recent 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 strategy 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—incur 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 history, E should be at least 0.50. However, E may be lower than 0.50 if some reliable experience is available and/or if the change in strategy is a refinement rather than a substantial 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., ≥ 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 CDHS 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).

D. 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 stochastic reserve 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.

E. 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, 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 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 variable annuity 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 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, 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 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.

VM-31 Section 3.C.5

Assets and Risk Management – A brief description of the asset portfolio, and the approach used to model risk management strategies, such as hedging, and other derivative programs, including a description of any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4.

VM-31 Section 3.D.6.f

Risk Management – Detailed description of model risk management strategies, such as hedging and other derivative programs specific to the groups of policies covered in this sub-report and not discussed in the Life Summary Section 3.C.5. This should include documentation for any hedging strategy that meets the requirements to be a CDHS. It should also include, for any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4, documentation of any CDHS criteria met, listing of CDHS criteria not met, and documentation of the reserve level with and without the SHS being modeled as if it were a CDHS.


   a. Investment Officer on Investments – A certification from a duly authorized investment officer that the modeled company investment strategy, including any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4, is representative of and consistent with the company’s investment policy.
   b. Qualified Actuary on Investments – A certification by a qualified actuary, not necessarily the same qualified actuary that has been assigned responsibility for the PBR Actuarial Report or this sub-report, that the modeling of any CDHS and any SHS that is required to be modeled pursuant to VM-20 Section 7.K.4 was performed in accordance with VM-20 and in compliance with all applicable ASOPs, and the alternative investment strategy as defined in VM-20 Section 7.E.1.g reflects the prescribed mix of assets with the same WAL as the reinvestment assets in the company investment strategy.

VM-31 Section 3.E.5

Assets and Risk Management – A brief description of the general account asset portfolio, and the approach used to model risk management strategies, such as hedging and other derivative programs, including a description of any
CDHS or any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6, and any material changes to
the hedging strategy from the prior year.

**VM-31 Section 3.F.8**

**Hedging and Risk Management** – The following information regarding the hedging and risk management
assumptions used by the company in performing a principle-based valuation under VM-21:

a. **Strategies** – Detailed description of risk management strategies, such as hedging and other derivative
   programs, including any CDHS or any SHS that is required to be modeled pursuant to VM-21 Section
   9.A.6, specific to the groups of contracts covered in this sub-report.
   i. Descriptions of basis risk, gap risk, price risk and assumption risk,
   ii. Methods and criteria for estimating the a priori effectiveness of the strategy.
   iii. Results of any reviews of actual historical hedging effectiveness.

b. **CDHS** – Documentation for any hedging strategy that meets the requirements to be a CDHS.

c. **Other Modeled Hedging Strategies** – Documentation for any SHS that is required to be modeled pursuant
to VM-21 Section 9.A.6, including documentation of any CDHS criteria met, listing of CDHS criteria not
met, and documentation of the TAR level with and without the SHS being modeled as if it were a CDHS.

d. **Strategy Changes** – Discussion of any changes to the hedging strategy during the past 12 months, including
   identification of the change, reasons for the change, and the implementation date of the change.

e. **Hedge Modeling** – Description of how the hedge strategy was incorporated into modeling, including:
   i. Differences in timing between model and actual strategy implementation.
   ii. For a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-
       21 Section 9.A.6, disclosure of the method used to consider hedge assets included in the starting
       assets, either (1) including the asset cash flows in the projection model; or (2) replacing the hedge
       positions with cash and/or other general account assets in an amount equal to the market value of
       the hedge positions, as discussed in VM-21 Section 4.A.4.a.
   iii. Evaluations of the appropriateness of the assumptions on future trading, transaction costs, other
       elements of the model, the strategy, and other items that are likely to result in materially adverse
       results.
   iv. If residual risks and frictional costs are assumed to have a value of zero, a demonstration that a value
       of zero is an appropriate expectation.
   v. Any discontinuous hedging strategies modeled, and where such discontinuous hedging strategies
       contribute materially to a reduction in the stochastic reserve, any evaluations of the interaction of
       future trigger definitions and the discontinuous hedging strategy, including any analyses of model
       assumptions that, when combined with the reliance on the discontinuous hedging strategy, may
       result in adverse results relative to those modeled.
   vi. Disclosure of any situations where the modeled hedging strategies make money in some scenarios
       without losing a reasonable amount in some other scenarios, and an explanation of why the situations
       are not material for determining the CTE 70 (best efforts).
   vii. Results of any testing of the method used to determine prices of financial instruments for trading in
       scenarios against actual initial market prices, including how the testing considered historical
       relationships. If there are substantial discrepancies, disclosure of the substantial discrepancies and
       documentation as to why the model-based prices are appropriate for determining the stochastic
       reserve.
   viii. Any model adjustments made when calculating CTE 70 (adjusted), in particular, any liquidation or
       substitution of assets for currently held hedges.

e. **Error Factor (E) and Back-Testing** – Description of E, the error factor, and formal back-tests performed,
   including:
   i. The value of E, and the approach and rationale for the value of E used in the reserve calculation.
ii. For companies that model hedge cash flows using the explicit method, as described in VM-21 Section 9.C.6.a, and have 12 months of experience, an analysis of at least the most recent 12 months of experience and the results of a back-test showing that the model is able to replicate the hedging results experienced in a way that justifies the value used for $E$. Include at least a ratio of the actual change in market value of the hedges to the modeled change in market value of the hedges at least quarterly.

iii. For companies that model hedge cash flows using the implicit method, and have 12 months of experience, as described in VM-21 Section 9.C.6.b, the results of a back-test in which (a) actual hedge asset gains and losses are compared against (b) proportional fair value movements in hedged liability, including:
   a) Delta, rho and vega coverage ratios in each month over the back-testing period, which may be presented in a chart or graph.
   b) The implied volatility level used to quantify the fair value of the hedged item, as well as the methodology undertaken to determine the appropriate level used.

iv. For companies that do not model hedge cash flows using either the explicit method or the implicit method, as described in VM-21 Section 9.C.6.c, and have 12 months of experience, the results of the formal back-test conducted to validate the appropriateness of the selected method and value used for $E$.

v. For companies that do not have 12 months of experience, the basis for the value of $E$ is chosen based on the guidance provided in VM-21 Section 9.C.7, considering the actual history available and the degree and nature of any changes made to the hedge strategy.

f. Safe Harbor for CDHS – If electing the safe harbor approach for CDHS, as discussed in VM-21 Section 9.C.8, a description of the linear instruments used to model the option portfolio.

g. Hedge Model Results – Disclosure of whether the calculated CTE 70 (best efforts) is below both the fair value and CTE 70 (adjusted), and if so, justification for why that result is reasonable, as discussed in VM-21 Section 9.D.

**VM-31 Section 3.F.12.c**

CTEPA – If using the CTEPA method, a summary including:

i. Disclosure (in tabular form) of the scenario reserves using the same method and assumptions as those used by the company to calculate CTE 70 (adjusted) as outlined in VM-21 Section 9.C (or the stochastic reserves following VM-21 Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-21 Section 9.A.6), as well as the corresponding scenarios reserves substituting the assumptions prescribed by VM-21 Section 6.C.

ii. Summary of results from a cumulative decrement projection along the scenario whose reserve value is closest to the CTE 70 (adjusted), as outlined in VM-21 Section 9.C (or the stochastic reserves following VM-21 Section 4.A.4.a for a company that does not have a CDHS or a SHS that is required to be modeled pursuant to VM-21 Section 9.A.6), under the assumptions outlined in VM-21 Section 6.C. Such a cumulative decrement projection shall include, at the end of each projection year, the projected proportion (expressed as a percent of the total projected account value) of persisting contracts as well as the allocation of projected decrements across death, full surrender, account value depletion, elective annuitization, and other benefit election.

iii. Summary of results from a cumulative decrement projection, identical to (ii) above, but replacing all assumptions outlined in VM-21 Section 6.C with the corresponding assumptions used in calculating the stochastic reserve.

**VM-31 Section 3.F.16.a and Section 3.F.16.b**

a. Investment Officer on Investments – A certification from a duly authorized investment officer that the modeled asset investment strategy, including any CDHS and any SHS that is required to be modeled pursuant
to VM-21 Section 9.A.6, is consistent with the company’s current investment strategy except where the modeled reinvestment strategy may have been substituted with the alternative investment strategy, and also any CDHS meets the requirements of a CDHS.

b. **Qualified Actuary on Investments** – A certification by a qualified actuary, not necessarily the same qualified actuary that has been assigned responsibility for the PBR Actuarial Report or this sub-report, that the modeling of any CDHS and any SHS that is required to be modeled pursuant to VM-21 Section 9.A.6 was performed in accordance with VM-21 and in compliance with all applicable ASOPs.
Mortality Data Collection: Upcoming Events

Pat Allison, FSA, MAAA
April 8, 2021

2021 Experience Data Collection Timeline

| Now | Companies may: 1) request exemptions or communicate exclusions (ongoing until 9/30/21), 2) review training materials, and 3) prepare submissions |
| Q2, 2021 | Call for companies to submit data for 2018 and 2019 observation years using 2020/2021 Valuation Manual requirements. As of 4/1/21, we are expecting to collect data from 127 companies, representing approximately 90% of industry claims. |
| 9/30/21 | Deadline to submit data using the Regulatory Data Collection (RDC) tool. Automatic feedback on form and format data exceptions will be provided upon submission. Additional feedback will be provided within 30 days based on actuarial review. |
| 12/31/21 | Deadline for companies to make corrections |
| 5/31/22 | NAIC to submit aggregate experience data to SOA |
Topics for Future Meetings with Companies

- Kick-off Meeting: Overview of data collection process, resources, and steps companies need to take prior to the data call
- Data validation and reasonability checks the NAIC will perform
- Walk-through of sample control total and reconciliation templates
- Communications with companies
- Policy for data submission by a reinsurer or third-party administrator
- How to submit data using the RDC Tool