

MEETING MATERIALS
SUPPLEMENTAL PACKET

LIFE ACTUARIAL (A) TASK FORCE

April 8, 2021

NAIC SPRING NATIONAL MEETING

Virtual

April 8, 2021

TABLE OF CONTENTS

PAGE

1	APF 2020-10 Revised to Show Tracked Changes
6	Additional ESG Discussion Materials
20	LPC Updates

Agenda Item 4

Future Mortality Improvement

APF 2020-10 Revised to show tracked changes

Dates: Received	Reviewed by Staff	Distributed	Considered
03/26/21	RM		
APF 2020-10 revised 3/26/21			

**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.

Pat Allison – NAIC, Scott O’Neal – NAIC, Mary Bahna-Nolan – Pacific Life, and Rachel Hemphill – Texas Department of Insurance; SOA for development of rates and loading.

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:

Valuation Manual (January 1, 2021 edition), VM-20 Section 6.A.2.b.v, VM-20 Section 8.C Introductory Paragraph, VM-20 Section 8.C.18 and Guidance Note, VM-20 Section 9.C.2.h, VM-20 Section 9.C.3.g, VM-20 Section 9.C.7.h (new), VM-31 Section 3.D.3.i, VM-31 Section 3.D.11.c.i

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 ~~the~~ 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 policies issued on or after Jan. 1, 2020, and optionally for policies issued on or after Jan. 1, 2017, and before Jan. 1, 2020:~~

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. For policies issued on or after Jan. 1, 2020, and optionally for policies issued on or after Jan. 1, 2017, and before Jan. 1, 2020:~~

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.

~~**Guidance Note:** The above method is an interim approach. A longer term solution to YRT is intended to be adopted by state insurance regulators, after state insurance regulators and industry have had additional time to consider and evaluate the variety of approaches that have been put forward as a potential longer-term solution.~~

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 mortality assumptions in Section 9.C.7.f.

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 mortality assumptions 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 mortality assumptions 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:

- 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 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~~ 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.

Agenda Item 5

Additional ESG Discussion Materials

LATF ESG Statement

ESG Common Comments

Updated ESG Question Log



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)

Executive Office | 444 North Capitol Street NW | Suite 700 | Washington, DC 20001 | (202) 471-3990

Central Office | 1100 Walnut Street | Suite 1500 | Kansas City, MO 64106-2197 | (816) 842-3600

Capital Markets & Investment Analysis Office | One New York Plaza | Suite 4210 | New York, NY 10004 | (212) 398-9000

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



1

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**



2

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**

5 Commenters

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

3

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**

3 Commenters

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

4

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**

4 Commenters

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

5

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**

4 Commenters

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

Time Period	Average 20 Yr – 1 Yr	Inversion Frequency
20 Years	2.3%	1.25%
40 Years	2.0%	3.75%
60 Years	1.5%	13.19%
80 Years	1.4%	11.25%

6

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 ESGW 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**

3 Commenters

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?

7

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**

4 Commenters

Response:

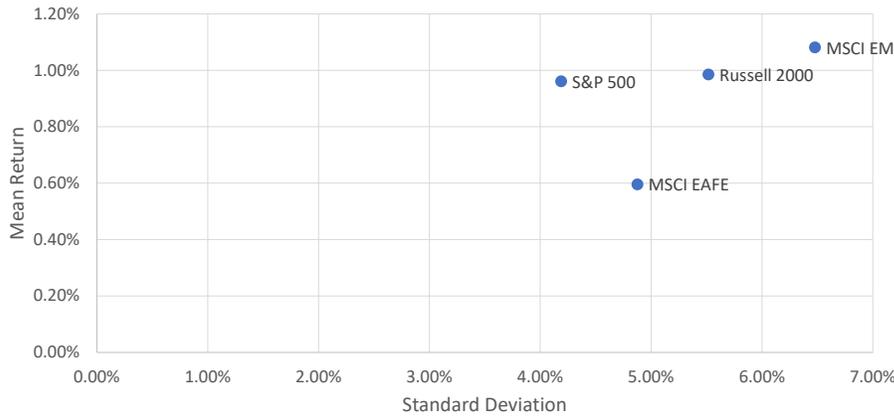
- **Regulator Decision:** Should International Diversified Equity returns align with history or risk/return framework?
- Exposed scenarios only have Total Return
 - Conning is developing a revised specification
 - Expect to release shortly
- For the past 30+ years, International Diversified Equity returns have underperformed
 - About 2% below Large Cap per year with slightly higher volatility

8

International Returns



Historical Risk vs Reward
Monthly Data from Dec 1987 through Dec 2020



9

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**

3 Commenters

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.

10

Data Format



Commentary:

- “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.” - **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**

3 Commenters

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 columnn?
 - Months as rows or columns?

11

Projection Period



Commentary:

- “The ESGWG 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**

4 Commenters

Response:

- NAIC recommends a projection period of 100 years

12

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**

6 Commenters

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.

13

Open Discussion on Comments Not Covered in Common Themes

NATIONAL ASSOCIATION OF
INSURANCE COMMISSIONERS

© 2021 NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

14

14

Item #	Source	Question	Type	Addressed?	If so, where?
1	ACLI	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.)	Question	Partial	ESG Goals; Model Selection Slides
2	ACLI	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?	Question	No	Expect this to be part of the Field Test
3	ACLI	Documentation Request Please provide greater specifics about the processes, distributions, etc. Such information needed includes: a.Model selection considerations b.Direct and indirect relationships (e.g., equity risk premium, equity / credit, rate / spread relationships) 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 d.State process information - including all distributions and correlation structures 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 f.Process and criteria for evaluating the reasonability each published scenario distribution (beyond validating that targets are reproduced)	Documentation Request	Partial	Bond Fund Returns: ESG Q&A, Section C, Q8, Model Selection slides
4	ACLI	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).	Documentation Request	Yes	International Equity Indices Presentation
5	ACLI	Documentation Request 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. a.Equity returns in the presentations and fan charts should focus on the distribution of accumulation factors over time. This information is more relevant than annual returns in a single year. 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.	Statistic Request	Yes	Available in Fan Charts for the 12/31/20 "Revised Baseline" Scenarios
6	ACLI	Please provide the SERT scenarios based on Revised Baseline UST calibration.	Scenario Request	Yes	Available with 12/31/20 "Revised Baseline" scenarios
7	ACLI	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.	Scenario Request	Yes	naic.conning.com/scenar iofiles
8	ACLI	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).	Question	Yes	ESG Q&A, Section B, Q10
9	Chris Conrad	With respect to the treasury calibration, is the optimization problem (i.e. solving for theta, kappa, displacement, etc.) a convex problem. 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)?	Question	Yes	ESG Q&A, Section A, Q13
10	Chris Conrad	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?	Question	Yes	ESG Q&A, Section B, Q9

11	Prudential	[Describe] the mechanics of Conning's calibration.	Question	Yes	GEMS_Parameterization _Methodology_NAIC
12	Prudential	[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?	Question	Partial	Model Selection Slides
13	Prudential	[Describe the] out of the box capabilities in GEMS to allow different relationships (vs. just substituting different parameter values)?	Question	Yes	ESG Q&A, Section B, Q12
14	Prudential	[Are there] not out-of-the-box changes that Conning would be willing to consider / implement?	Question	Yes	ESG Q&A, Section B, Q12 and Q13
15	Prudential	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?	Question	No	To be addressed as part of item #8 in the ESG timeline.
16	Prudential	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)	Question	Yes	ESG Q&A, Section K, Q1
17	Prudential	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?)	Question	No	To be addressed as part of item #8 in the ESG timeline.
18	Prudential	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?	Question	Yes	ESG Q&A, Section F, Q4
19	Prudential	Why are bond funds assumed to only invest in industrials (not financials or industrials)?	Question	Yes	ESG Q&A, Section C, Q1
20	Prudential	Do BBB bonds reflect a selected BBB bond, a universe of BBB+ / BBB / BBB- bonds, etc.?	Question	Yes	ESG Q&A, Section C, Q2
21	Prudential	How are the international fund returns expressed: hedged or unhedged?	Question	Yes	ESG Q&A, Section B, Q1
22	Prudential	How often will the parameters of the model be updated?	Question	Yes	ESG Q&A, Section G, Q1
23	Prudential	See "Prudential" tab	Question/Comment	No	
24	Craig Chupp	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?	Question	Yes	ESG Q&A, Section B: Q7
25	Craig Chupp	How is the value of the mean reversion speed parameter in the Variance Equation determined?	Question	Yes	ESG Q&A, Section B, Q7

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? What are all the randoms for that time node? iii.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 week-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 a factor of 364/365 used for the extra day? iii.What about leap years? c.Does the forward rate residual curve use (is it 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	
29	Link Richardson	On page 13 [of the 12/17/20 LATF Equity and Corporate Model Presentation], are the 2 year and 30 year “columns” annualized returns?	Question	Yes	ESG Q&A, Section I, Q1
30	Link Richardson	On page 18 [of the 12/17/20 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&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 Lambda0 get added together in the targets. Why are there two separate parameters?	Question	Yes	ESG Q&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 Lambda0 and Lambda1) doesn't impact the scenarios?	Question	Yes	ESG Q&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&A, Section A, Q2
35	Mark Tenney	See "Mark Tenney" tab, "Mark Tenney Questions 3/8/21"	Question	Partial	ESG Q&A, Section A, Various
36	Mark Tenney	See "Mark Tenney" tab, "Mark Tenney Efficiency Commentary 3/17/21"	Comment	No	
37	Matt Kauffman	Does the API accept a starting Yield Curve or is it fed the initial state variables?	Question	Yes	ESG Q&A, Section D, Q3
38	Matt Kauffman	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&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&A, Section F, Q7
41	Scott Schneider	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.	Question	No	To be addressed as part of ESG Timeline #8
42	Scott Schneider	If 10,000 scenarios are not enough for convergence (particularly for CTE98), what do we do?	Question	No	

43	Scott Schneider	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.	Question	Yes	ESG Q&A, Section F, Q7
44	Scott Schneider	Will individual states (e.g. New York) have different requirements? We would like the scenarios to be provided with and without individual state requirements.	Question	No	
45	Scott Schneider	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?	Question	Yes	ESG Q&A, Section B, Q6
46	Seong-min Eom	I propose the scenarios listed below exposed for public comments and review. <ul style="list-style-type: none"> •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.	Scenario Request	Yes	Posted to naic.conning.com/scenarios/naic-conning-com-scenarios-2021-02-24
47	Seong-min Eom	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.	Statistic Request	Yes	These new charts can be seen in the fan charts for the 12/31/20 "Revised Baseline" scenarios
48	Steve Tizzoni	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.	Question	Yes	ESG Q&A, Section B, Q11
49	Steve Tizzoni	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?	Scenario Request	Yes	naic.conning.com/scenarios/naic-conning-com-scenarios-2021-02-24
50	Ted Chang	<ul style="list-style-type: none"> i. Regarding the construction of yield curve to produce the scenario files <ul style="list-style-type: none"> ➤ Which set of short rate is used, $r(t) = l(t) + \sum_{i=1}^3 x_i(t)$ under the real-world measure or $r(t) = l(t) + \sum_{i=1}^3 X_i(t)$ under the risk-neutral measure? ➤ Which set of auxiliary functions is used, $\{A_i(\tau), B_i(\tau)\}$ with the risk-neutral parameterization or $\{\bar{A}_i(\tau), \bar{B}_i(\tau)\}$ with the real-world parameterization? ii. Regarding the risk premiums, how to make sense of the results that each of the sets $\{\lambda_{0_1}, \lambda_{0_2}, \lambda_{0_3}\}$ and $\{\lambda_{1_1}, \lambda_{1_2}, \lambda_{1_3}\}$ contains <u>both</u> positive and negative numbers if they are meant to be risk premiums? iii. Regarding the feeding of interest rate to the equity return model, what exactly is the rate $r(t)$ which passes through to the drift term for each simulation of the equity return if the process is <u>not</u> stochastic-on-stochastic? 	Question	No	
51	Tim Finnegan	Q&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.	Comment	Yes	ESG Common Comment Themes Presentation, LATF 4/8/21
52	Tim Finnegan	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.	Comment	Yes	ESG Common Comment Themes Presentation, LATF 4/8/21

53	Vincent Tsang	<p>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</p> <p>AIRG cumulative wealth factor = 1.3082 (GEMS cumulative wealth factor) + 1.4558</p> <p>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?</p>	Question	Yes	ESG Q&A, Section B, Q4
54	Vincent Tsang	<p>In the first page of the ppt slides "Equity Equation," the differential equation is listed as follow:</p> $dS(t)/(S(t)) = [(r(t) - D(t)) + \mu_0 + \mu_1 V(t) - \lambda m V(t)] dt + V(t) dW_1(t) + \gamma dN(t)$ <p>As the jump parameters λ 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?</p>	Question	Yes	ESG Q&A, Section B, Q5

Agenda Item 7

LPC Update

Life Practice Council Update

Laura Hanson, MAAA, FSA
Vice President



AMERICAN ACADEMY of ACTUARIES

Objective. Independent. Effective.™

© 2021 National Association of Insurance Commissioners

Life Actuarial Task Force Meeting—April 8, 2021

21

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.