VM-20/VM-21 ESG Technical Drafting Group
SERT Scenario Discussion

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NAIC NATIONAL ASSOCIATION OF
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Agenda

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2. Overview of 12/31/21 Field Test Runs
3. UST SERT Overview
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Recap of 2/2/23 Discussion

- Steve Strommen discussed the development of the SERT scenarios
  - Purpose was to avoid resource intensive calculations for less risky products
  - Pass threshold determined so that generally 20-year Level Term product would pass while a typical Universal Life with Secondary Guarantee (ULSG) product would fail
  - SERT scenarios are currently produced using the AIRG
- Dan Finn provided information on the methodology used to produce SERT scenarios for the NAIC ESG Field Test
  - Due to structural differences between AIRG and GEMS®, SERT methodology cannot simply be ported over
  - On 1/21/21, NAIC exposed Conning percentile methodology that captured the stylistic characteristics of the SERT scenarios while accounting for the changes in the scenarios between the AIRG and GEMS®

Overview of 12/31/21 Field Test Runs

Run #	Description	Purpose of Run
Baseline #1	Scenario set(s) the company used for 12/31/21 statutory reporting	Baseline used as comparative basis for 12/31/21 runs
Test #1a	GEMS Baseline Equity and Corporate model scenarios as of 12/31/21, and Conning Treasury model calibration with generalized fractional floor as of 12/31/21	Tests Conning Treasury model w/ GFF and Baseline Equity at YE 2021
Test #1b	Same as Test #1a, but with Alternative Treasury model calibration with shadow floor as of 12/31/21	Tests Alternative Treasury model with shadow floor and Baseline Equity at YE 2021

Note: Bold = Required Run

1-year UST Scenario Distribution 12/31/21

Field Test Scenario Set #1A
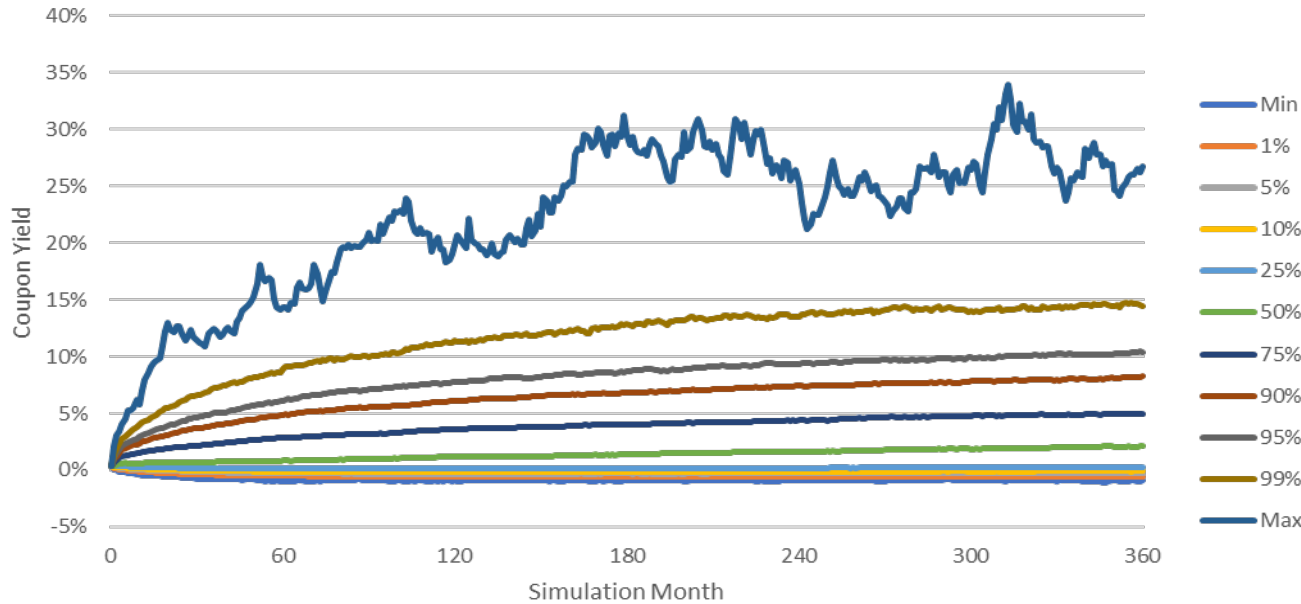
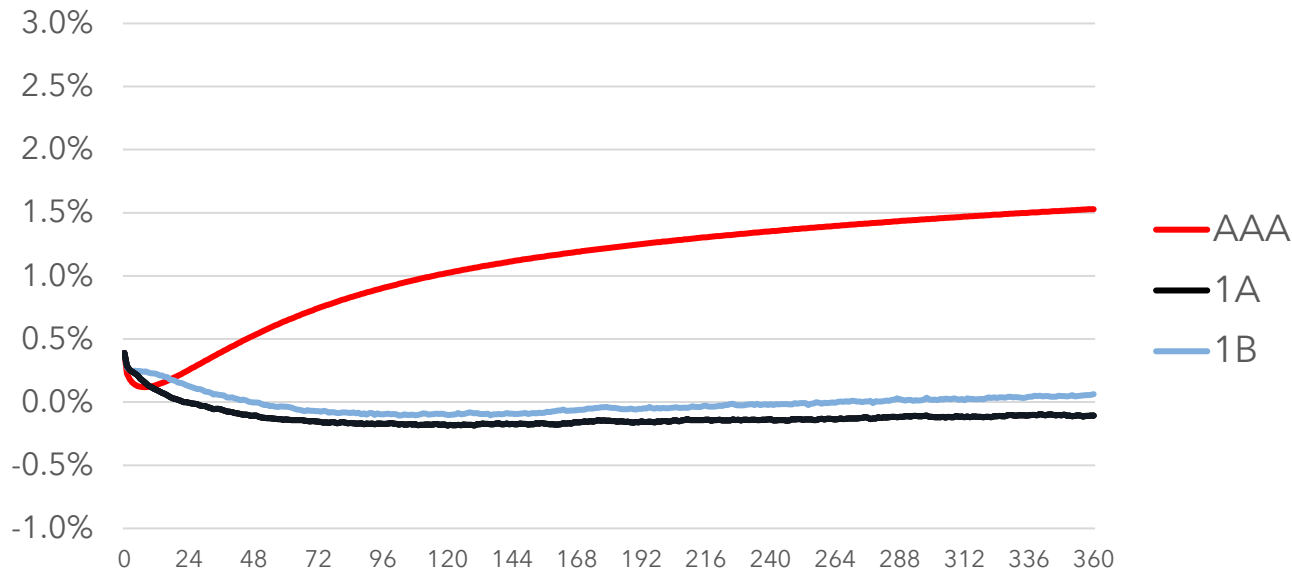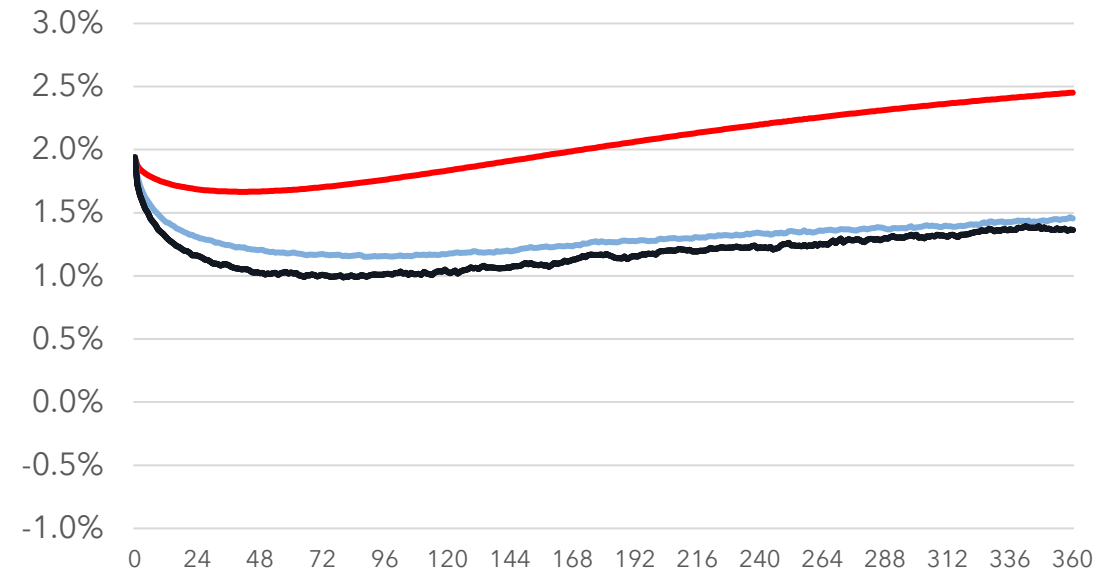**Field Test Scenario Set #1B**
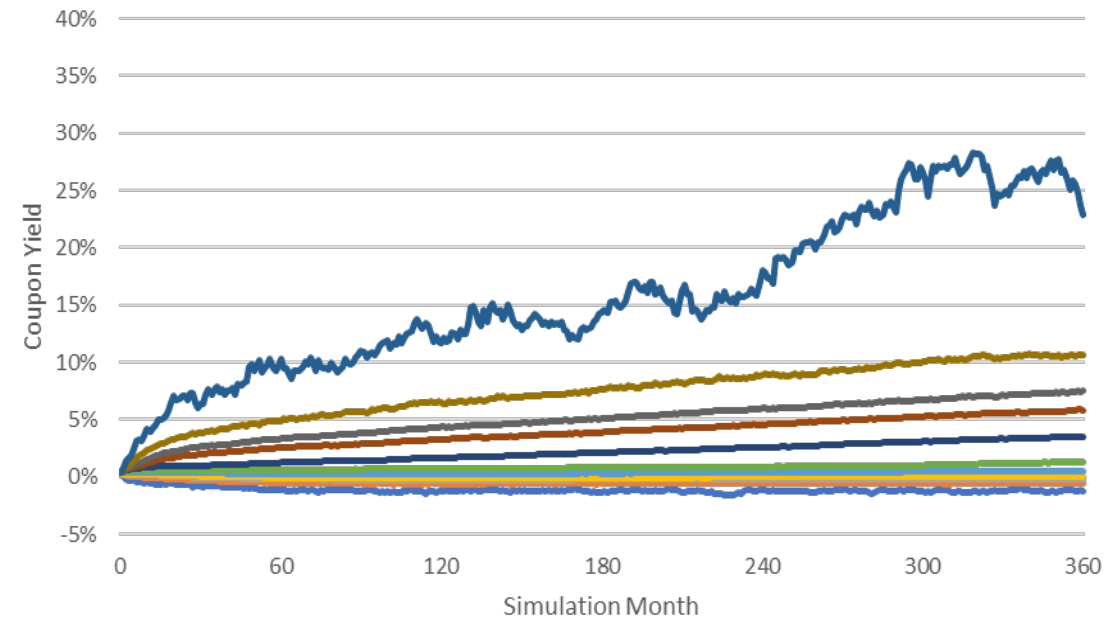
- Both the Conning Calibration with GFF (1A) and the Alternative Calibration with Shadow Floor (1B) produce a significant frequency of low rates, with the median rate 1-year UST staying under three percent even into the 30th projection year
- The Conning Calibration with GFF produces more frequent high interest rates than the Alternative Calibration with Shadow Floor

UST SERT Scenario 3 (Pop-down) at 12/31/21

1-Year UST Yield

20-Year UST Yield

Legend: AAA (red), 1A (black), 1B (blue)
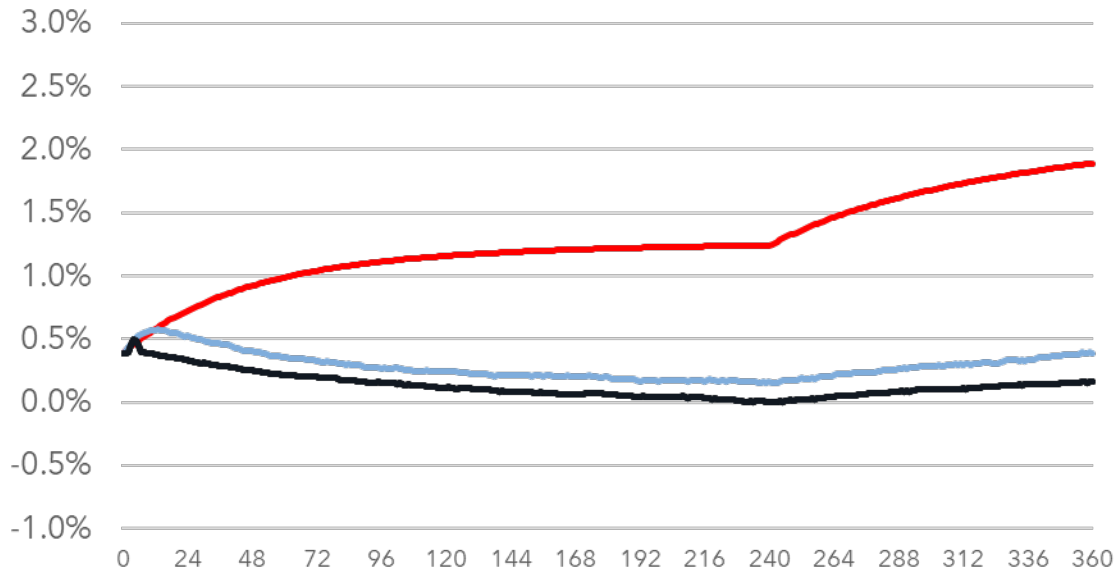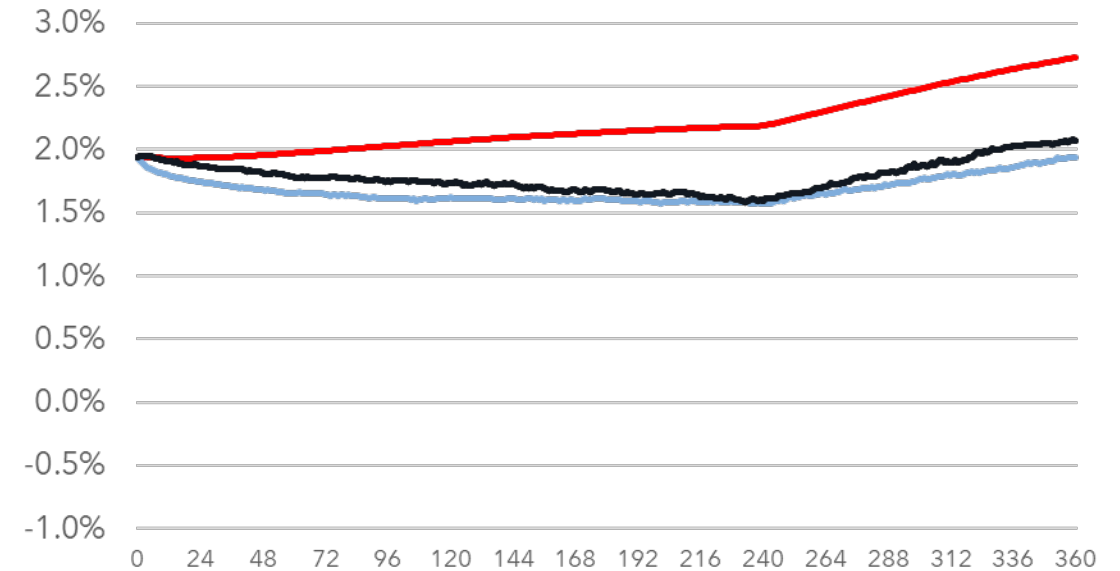
- The pop-down UST scenario for field test runs 1A and 1B are significantly lower than those produced by the AIRG
- **Pop-down description:** Interest rate shocks are selected to maintain the cumulative shock at the 10% level (1.282 standard errors).

UST SERT Scenario 12 (DR) at 12/31/21

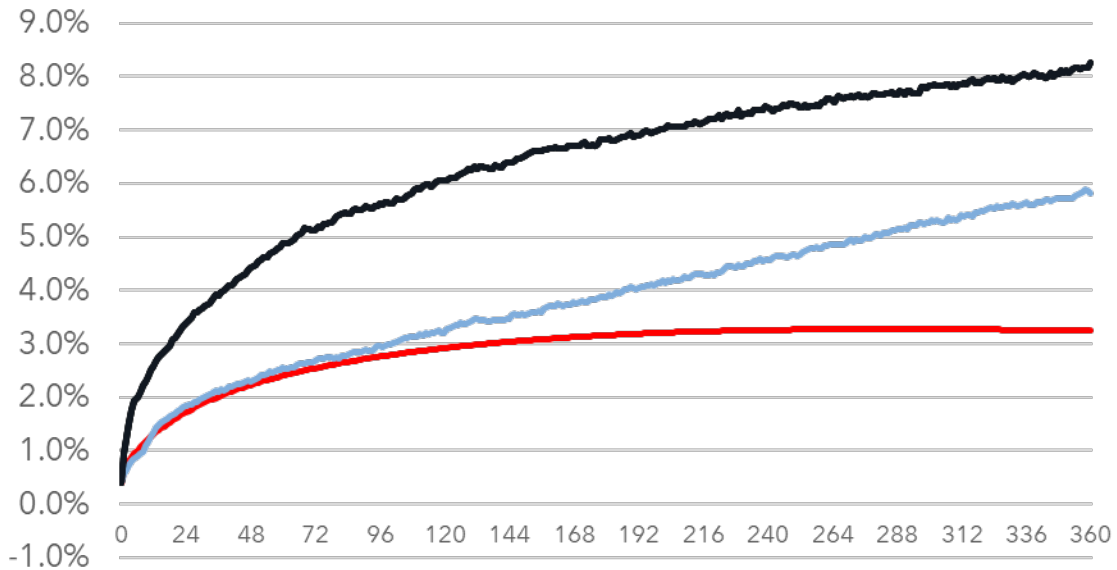1-Year UST Yield

20-Year UST Yield

- SERT Scenario 12 (the DR scenario) also has significantly lower rates for 1A and 1B compared to the AIRG
- **Scenario 12 description:** There are uniform downward shocks each month for 20 years, sufficient to get down to the one standard deviation point (84%) on the distribution of 20-year shocks. After 20 years, shocks are zero.

UST SERT Scenario 1 (Pop-up) at 12/31/21

1-Year UST Yield

20-Year UST Yield

Legend: AAA, 1A, 1B
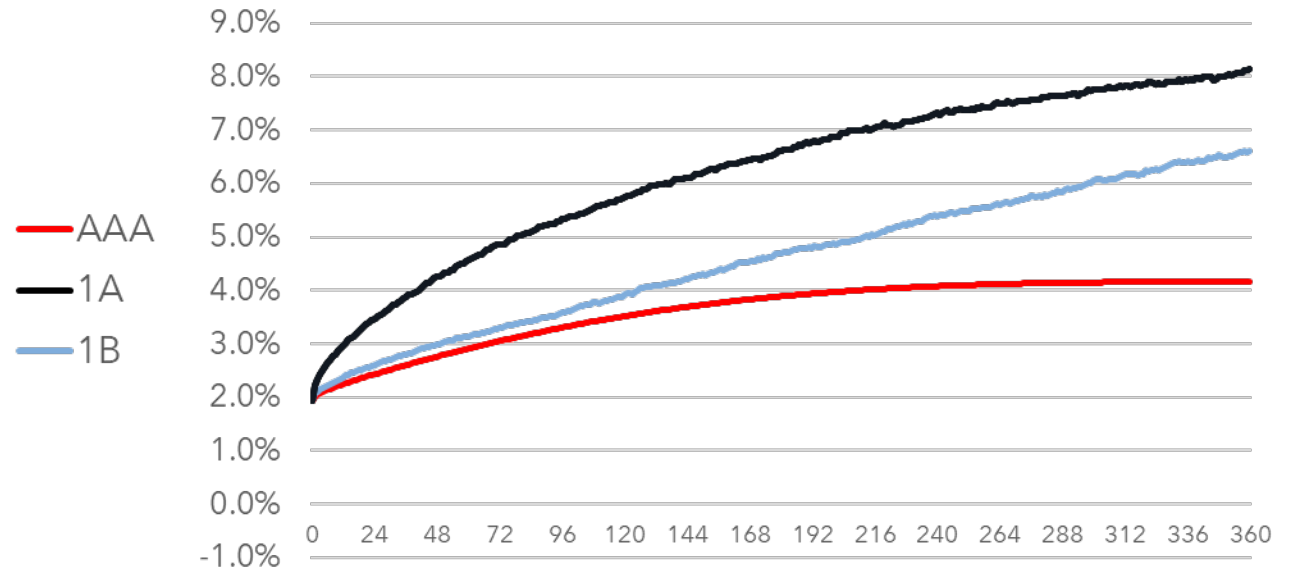
- The pop-up UST scenario for field test runs 1A and 1B are significantly higher than those produced by the AIRG. However, in the pop-up scenarios, field test 1A is also materially higher than field test 1B
- **Pop-up description:** Interest rate shocks are selected to maintain the cumulative shock at the 90% level (1.282 standard errors).

Field Test SERT Results - Term

**Term Reserving Category
Percentage of Model Segments Passing SERT**
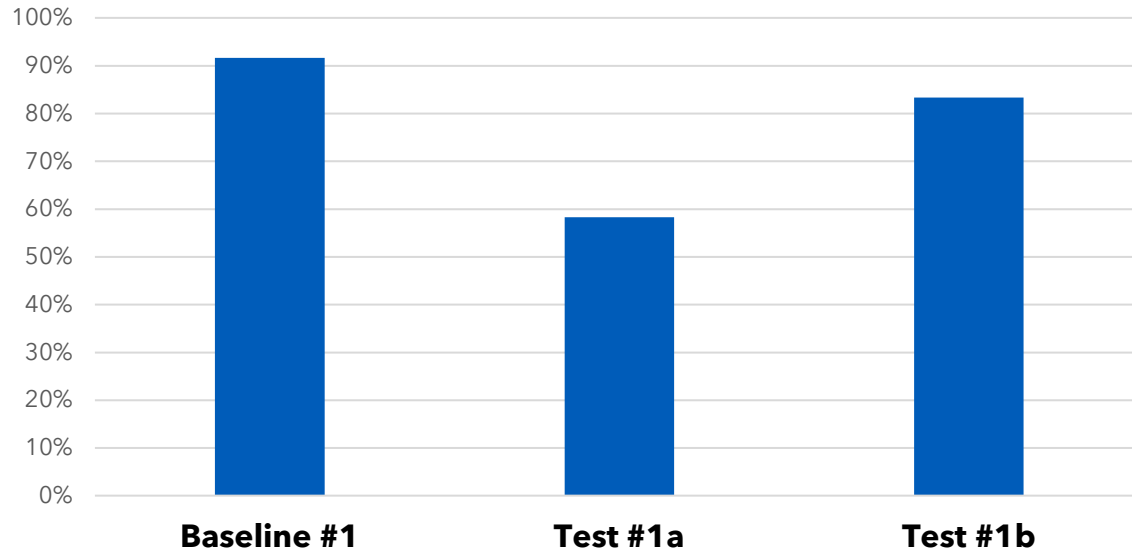
**Term Reserving Category
Average SERT Ratio**

- As compared to company Baseline #1 results, less of the field test run term model segments passed the SERT, with the biggest drop-off seen for the Conning Calibration w/ GFF (1A).
- The average (non-weighted) SERT result for term model segments increased for the field test runs compared to Baseline #1. Average SERT ratios increased the most for the Conning Calibration w/ GFF (1A).
- For the term model segment, the "b" largest adjust DR scenario was mostly consistent for a given model segment between the different field test runs. However, across model segments/legal entities, different "b" SERT scenarios were constraining.

Field Test SERT Results - ULSG

**ULSG Reserving Category
Percentage of Model Segments Passing SERT**

**ULSG Reserving Category
Average SERT Ratio**

- As compared to company Baseline #1 results, less of the field test run ULSG model segments passed the SERT, with the biggest drop-off seen for the Conning Calibration w/ GFF (1A).
- The average (non-weighted) SERT result for term model segments increased for the field test runs compared to Baseline #1. Average SERT ratios increased the most for the Conning Calibration w/ GFF (1A).
- The "b" scenario in the SERT calculation fluctuated between field test runs for some ULSG model segments but was stable in others
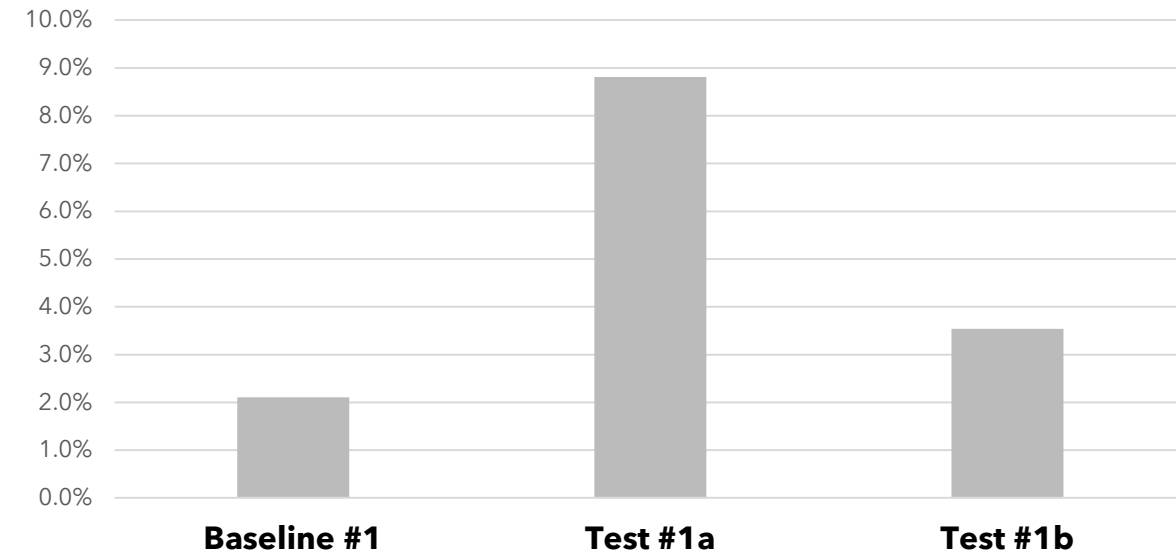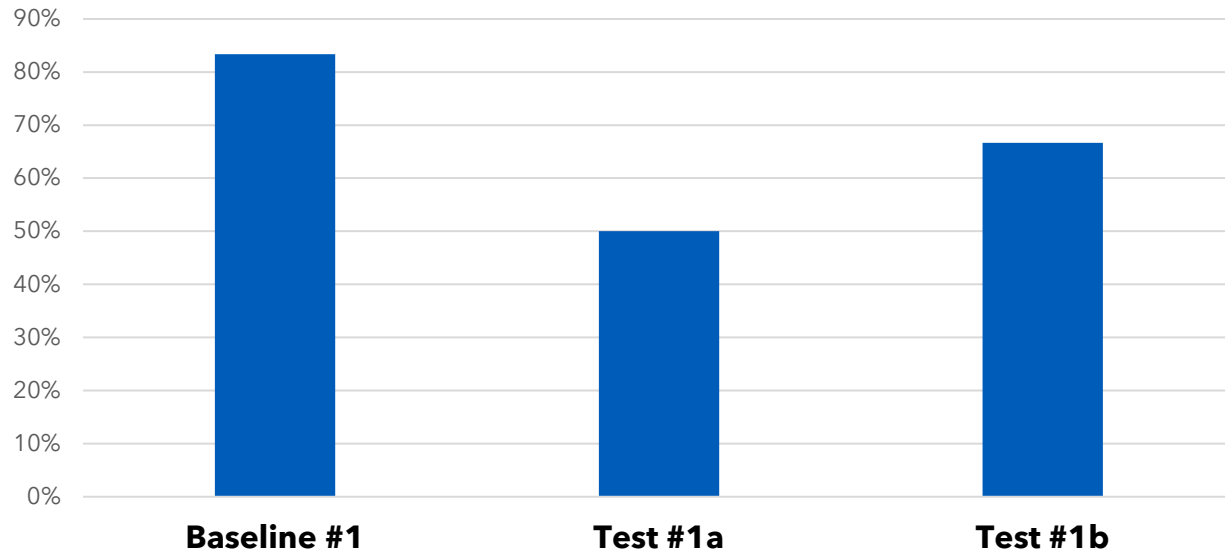
Field Test SERT Results - Other

**Other Reserving Category
Percentage of Model Segments Passing SERT**

**Other Reserving Category
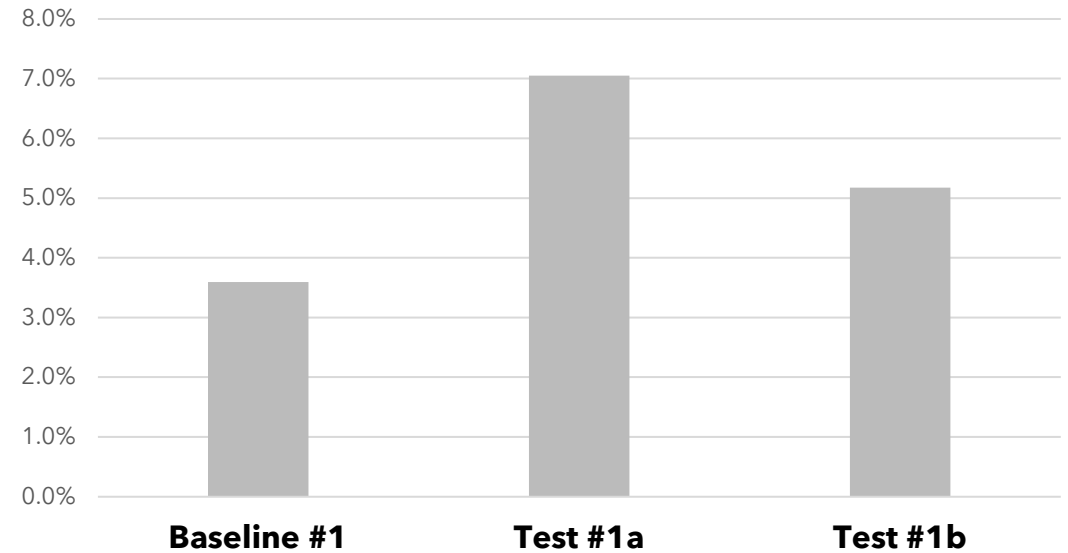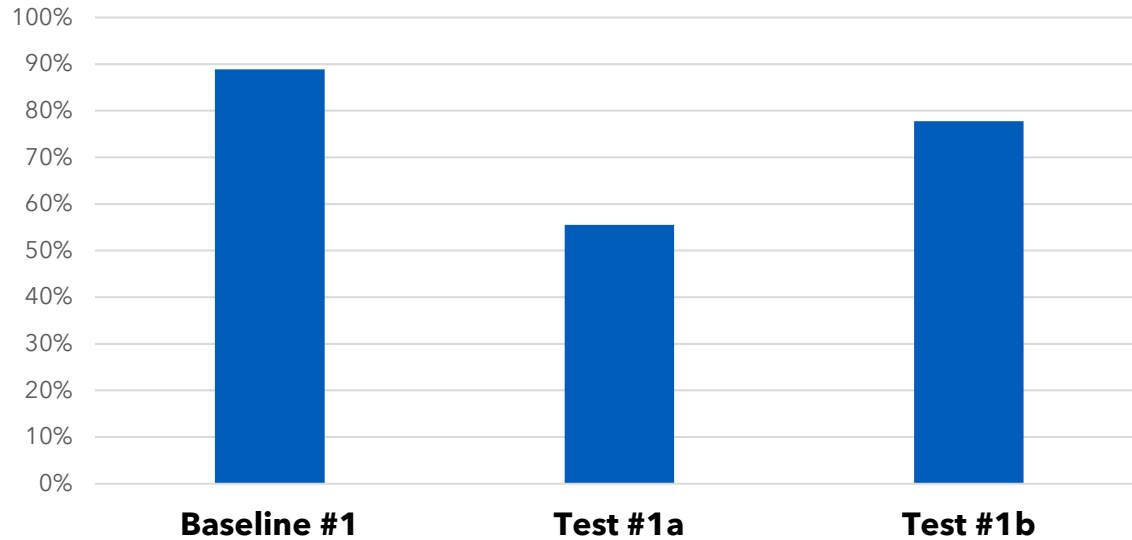Average SERT Ratio**
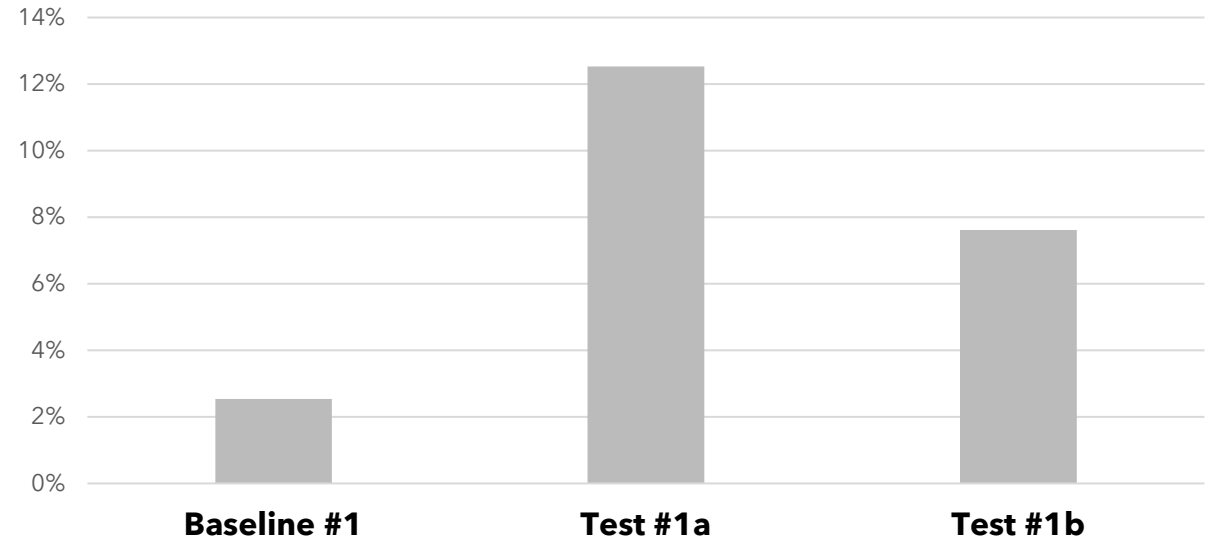
- As compared to company Baseline #1 results, less of the field test run Other model segments passed the SERT, with the biggest drop-off seen for the Conning Calibration w/ GFF (1A).
- The average (non-weighted) SERT result for term model segments increased for the field test runs compared to Baseline #1. Average SERT ratios increased the most for the Conning Calibration w/ GFF (1A).
- For the Other model segment, the "b" scenario frequently changed between the baseline and field test runs. Of those that change, most switched to a pop-down UST SERT scenario. Across model segments/legal entities, different "b" SERT scenarios were constraining.

Equity SERT Scenario 2 (Low Equity) at 12/31/21

Gross Wealth Factors

Scenario Set/Projection Year	1	5	10	20	30
AAA	0.88	0.93	1.12	1.80	3.07
1A	0.87	0.89	1.05	1.69	2.86
1B	0.88	0.92	1.08	1.68	2.72

Annualized Returns

Scenario Set/Projection Year	1	5	10	20	30
AAA	-11.5%	-1.4%	1.2%	3.0%	3.8%
1A	-12.6%	-2.3%	0.5%	2.7%	3.6%
1B	-11.8%	-1.7%	0.8%	2.6%	3.4%

- The gross wealth factors for field test scenario sets 1A and 1B are lower at the end of the 30th projection year than those produced by the AIRG, but comparable.

- **SERT Scenario 2 Description:** Equity returns are selected to maintain the cumulative equity return at the 10% level.

Equity SERT Scenario 12 (DR) at 12/31/21

Gross Wealth Factors

Scenario Set/Projection Year	1	5	10	20	30
AAA	1.04	1.22	1.48	2.19	4.52
1A	1.03	1.16	1.38	2.01	4.29
1B	1.04	1.19	1.40	2.00	4.04

Annualized Returns

Scenario Set/Projection Year	1	5	10	20	30
AAA	4.0%	4.0%	4.0%	4.0%	5.2%
1A	3.4%	2.9%	3.3%	3.6%	5.0%
1B	4.4%	3.5%	3.5%	3.5%	4.8%

- For the DR scenario, the Gross Wealth Factors are more closely aligned between the AIRG and the field test runs

- **SERT Scenario 12 Description:** There are uniform downward shocks each month for 20 years, sufficient to get down to the one standard deviation point (84%) on the distribution of 20-year shocks. After 20 years, shocks are zero.

Equity SERT Scenario 1 (High Equity) at 12/31/21

Gross Wealth Factors

Scenario Set/Projection Year	1	5	10	20	30
AAA	1.30	2.20	3.79	10.08	25.30
1A	1.25	1.96	3.41	10.24	31.64
1B	1.26	2.00	3.32	8.60	23.09

Annualized Returns

Scenario Set/Projection Year	1	5	10	20	30
AAA	30.0%	17.1%	14.2%	12.2%	11.4%
1A	25.2%	14.4%	13.1%	12.3%	12.2%
1B	26.4%	14.9%	12.7%	11.4%	11.0%

- The gross wealth factors for the high equity scenario for field test run 1A are significantly higher than those produced by the AIRG at the end of the 30th projection year.

- **Scenario 1 description:** Equity returns are selected to maintain the cumulative equity return at the 90% level.

Appendix: SERT Scenario Descriptions

Scenario 1 – Pop up, high equity	Interest rate shocks are selected to maintain the cumulative shock at the 90% level (1.282 standard errors). Equity returns are selected to maintain the cumulative equity return at the 90% level.
Scenario 2 – Pop up, low equity	Interest rate shocks are selected to maintain the cumulative shock at the 90% level (1.282 standard errors). Equity returns are selected to maintain the cumulative equity return at the 10% level.
Scenario 3 – Pop down, high equity	Interest rate shocks are selected to maintain the cumulative shock at the 10% level (1.282 standard errors). Equity returns are selected to maintain the cumulative equity return at the 90% level.
Scenario 4 – Pop down, low equity	Interest rate shocks are selected to maintain the cumulative shock at the 10% level (1.282 standard errors). Equity returns are selected to maintain the cumulative equity return at the 10% level.
Scenario 5 – Up/down, high equity	Interest rate shocks are selected that, for each five-year period, are consistently in the same direction. The cumulative shock for each five-year period is at the 90% level during "up" periods and at the 10% level during "down" periods.
Scenario 6 – Up/down, low equity	Interest rate shocks are selected that, for each five-year period, are consistently in the same direction. The cumulative shock for each five-year period is at the 90% level during "up" periods and at the 10% level during "down" periods. Equity returns are selected to maintain the cumulative equity return at the 10% level.
Scenario 7 – Down/up, high equity	Interest rate shocks are selected that, for each five-year period, are consistently in the same direction. The cumulative shock for each five-year period is at the 90% level during "up" periods and at the 10% level during "down" periods. Equity returns are selected to maintain the cumulative equity return at the 90% level.
Scenario 8 – Down/up, low equity	Interest rate shocks are selected that, for each five-year period, are consistently in the same direction. The cumulative shock for each five-year period is at the 90% level during "up" periods and at the 10% level during "down" periods. Equity returns are selected to maintain the cumulative equity return at the 10% level.
Scenario 9 – Baseline scenario	All shocks are zero.

Appendix: SERT Scenario Descriptions (continued)

Scenario 10 – Inverted yield curves	There are no shocks to long-term rates and equities. There are shocks to the spread between short and long rates that are consistently in the same direction for each three-year period. The shocks for the first three-year period are in the direction of reducing the spread (usually causing an inverted yield curve). Shocks for each subsequent threeyear period alternate in direction.
Scenario 11 – Volatile equity returns	There are no shocks to interest rates. There are shocks to equity returns that are consistently in the same direction for each two-year period and then switch directions.
Scenario 12 – Deterministic scenario for valuation	There are uniform downward shocks each month for 20 years, sufficient to get down to the one standard deviation point (84%) on the distribution of 20-year shocks. After 20 years, shocks are zero.
Scenario 13 – Delayed pop up, high equity	There are interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks– each 1.414 (square root of 2) times those in the first 10 years of Scenario 1. This gives the same 20-year cumulative shock as scenario 1, but all the shock is concentrated in the second 10 years. After 20 years, the shock is the same as scenario 1. Equity returns are selected to maintain the cumulative equity return at the 90% level.
Scenario 14 – Delayed pop up, low equity	There are interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks– each 1.414 (square root of 2) times those in the first 10 years of Scenario 2. This gives the same 20-year cumulative shock as scenario 2, but all the shock is concentrated in the second 10 years. After 20 years, the shock is the same as scenario 1. Equity returns are selected to maintain the cumulative equity return at the 10% level.
Scenario 15 – Delayed pop down, high equity	There are interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks– each 1.414 (square root of 2) times those in the first 10 years of Scenario 3. This gives the same 20-year cumulative shock as scenario 3, but all the shock is concentrated in the second 10 years. After 20 years, the shock is the same as scenario 3. Equity returns are selected to maintain the cumulative equity return at the 90% level.
Scenario 16 – Delayed pop down, low equity	There are interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks– each 1.414 (square root of 2) times those in the first 10 years of Scenario 4. This gives the same 20-year cumulative shock as scenario 4, but all the shock is concentrated in the second 10 years. After 20 years, the shock is the same as scenario 4. Equity returns are selected to maintain the cumulative equity return at the 10% level.