NAIC ESG Field Test
Questions and Answers (Q&A)
Last Modified: 8/16/2022

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Q1: Will scenario level volatility data be provided for each of the field test runs?

A1: As of 6/22/22, scenario level volatility data has been posted to naic.conning.com/scenariofiles. A file "Estimating AIRG Volatility" has also been uploaded to provide documentation on the scenario level volatility data.

Q2: For the field test runs that use a starting yield curve reflective of the environment at 12/31/2019 plus a level 200 BP shift - but run with YE 2021 inforce - could more detail be provided as to what is meant by "adjusting the inforce"?

A2: For runs where the starting yield curve for the Treasury model is set to the 12/31/19 level plus 200 BP, participants may need to make appropriate adjustments to their 12/31/21 inforce assets and/or liabilities. The field test does not require that participants perform these adjustments in a certain fashion, rather, it is expected that participants will take advantage of their company's existing processes for starting yield curve sensitivities. Some participants may elect to enter the 12/31/21 yield curve at time zero for these runs followed by the relevant 12/31/19 + 200 BP scenario data to allow their models to make these adjustments. Other participants may make specific adjustments to their inforce assets and/or liabilities as appropriate. Other methodologies may also be appropriate.

Q3: Do the instructions explain how to use ESG columns that are not a part of current ESG? For example the AAA ESG has LT Corp, not Long Inv Corp, Int Inv Corp, etc.?

A3: Section II.I of the instructions details how to map the funds from the AIRG to GEMS. Additionally, there have been additional columns set up at the end of the scenario files to provide one-to-one mappings for the Aggressive Equity, Diversified Fixed Income, and Diversified Balanced Allocation funds from the AIRG to the GEMS scenario files. More information on the return columns is included in the Basic Data Columns file on the Conning scenario website.

Q4: How do you want the discounting to be applied for each scenario reserve calculation?

A4: Field test participants should use discounting prescribed in the relevant statutory reserve or capital framework being tested and consistent with the approach used in their reporting.

Q5: When is the deadline for submitting the field test results?

A5: Field test results are due 8/31/22.

Q6: If a company used less than 200 scenarios for C3 Phase 1, can they use 40 scenarios for the field test or does the company have to use 200 scenarios specified in the instructions?

A6: For C3 Phase I, there is a minimum of 200 scenarios that are required to be run in the field test.

Q7: Do Baseline results need to be repeated in each field test run template, or is the intention to report them in their own separate template?

A7: A good practice would be to first add in all of the baseline result information into the relevant template. Then, use that template that contains the baseline results as the starting point for the results for all of the other field test runs. This will allow for comparisons to be made between the baseline and each field test run simply. There is no need to submit baseline and field test results separately.

Q8: If we pass the VM-20 Stochastic Exclusion Ratio Test in our reporting, but fail in at least one field test run - do we still need to calculate the Stochastic Reserve?

A8: Companies that routinely pass the Stochastic Exclusion Ratio Test for a relevant block of business may not have a stochastic model set up. Therefore, it is not required that participants in this situation compute stochastic reserves. However, the stochastic reserve results would be welcome if the company has the capability to produce them.

Q9: If a company uses the direct iteration method for VM-21, how would you advise filling out the field test template for the by-scenario results?

A9: Companies that use the direct iteration method can just provide time-zero reserve and capital values by scenario.

Q10: For C3 Phase I - I noticed the ESG Field Test for determining the C3 Factor is using tail weights further in the tail of results than what was previously prescribed from the 50 scenario runs. My question is if this is a consideration for a new C3 Factor calculation, or is this more extreme tail calculation purely for analysis purposes of the ESG?

- **Prior Method: 5th through 17th worst scenarios out of 50 (90th percentile to 66th)**
- **New Method: 92nd percentile to 98th percentile**

A10: There is no significant change to the level of conservatism, but rather the original 50 scenarios were selected so as to be among the most extreme of 200 scenarios. Thus the probability of each scenario is 1/200, or 0.5%. So the worst 4 encompass a 2% probability, and scenarios 5 through 17 encompass the next 6.5%, ranging from the 98th to the 91.5th percentile. The American Academy of Actuaries 1999 report describes this in Appendix 1 on page "7" (pdf 6) and in Appendix 4 on page 21.

Since the Scenario Picker selects scenarios at the center of each range, the worst scenario is considered to be at the 0.25th percentile, the center of 0% to 0.5%. In the 2014 Update Report, the proposal was to move to a CTE 90 metric, and the "odd 0.25%" was ignored.

Because the original "extreme scenario selection process" was very time consuming, it was not repeated in 2014. Thus the 200 scenarios now each still represent a 1/200 probability.

Q11: How are the total return values derived from the price and income? How should returns be accumulated to arrive at the compounded Price and Total Return index values (assuming that they both start at 100)?

A11: The field test scenario files produced by the GEMS ESG contain returns that are split by both Price and Income. This is different from those produced by the AIRG – which are simply Total Return. To get Total Return values from the field test scenario files produced by GEMS, simply add the Price and Income columns to get the Total Return. The compounded price and index returns can be obtained via the following formulae:

- r = price return, i = income return for t=1,2,…,n)
- Compound Price index = 100*(1+r1)*(1+r2)*…*(1+rn)
- Compound Total Return index = 100*(1+r1+i1)*(1+r2+i2)*…*(1+rn+in)

Also see the table below for example calculations.

Example 11:

Scen	TIME	Large Cap Price	Large Cap Income	Compounded Large Cap Price Index	Compounded Large Cap Total Return Index
4	0	0	0	100	100
4	1	-0.008592	0.002435	99.1408	99.3843
4	2	0.011535	0.003057	100.2843891	100.8345157
4	3	0.016275	0.003487	101.9165176	102.8272074
4	4	0.02116	0.002918	104.0730711	105.3030809
4	5	0.024848	0.002989	106.6590787	108.2344028
4	6	0.023858	0.002492	109.203751	111.0863793
4	7	0.092111	0.002189	119.2626178	121.5618248
4	8	-0.035093	0.002193	115.0773347	117.5624408
4	9	0.060118	0.002458	121.9955539	124.919

Q12: For scenario set used in Baseline #2 - is the only change we are supposed to assume is just a different starting initial yield curve?

A12: Yes, the only change that should be made to the ESG used in the company's year-end 2021 reporting should be the starting yield curve used. No other changes (e.g. changing the Mean Reversion Parameter) should be made. See the instructions for more information.

Q13: How should the scenario-level field test provided in each of the respective VM-20, VM-21/C3 Phase II, and C3 Phase I templates be ordered?

A13: Provide the scenario specific results in the same order that they are provided for in the respective field test scenario set or subset. Please note that the scenario subsets are not necessarily ordered consecutively by Scenario ID (i.e. the Scen column). The example below shows the order by Scenario ID for the Field Test #1a 9/30/21 200 scenario subset as they are presented in the file. When the scenario level results are presented, you would want to make sure that no sorting according to the Scenario ID was performed and that the order you provide scenario level results in the template is the same as that provided in the scenario file.

132
358
392
265
298
491
12
525
461
…

Q14: Why are the patterns of equity returns in Stochastic Exclusion Ratio Test (SERT) scenarios 13 through 16 different than what is produced by the AIRG?

A14: For SERT scenarios 13 through 16, the equity scenarios "maintain the cumulative equity return at the 90% (or 10%) level" as described in Appendix 1 of VM-20. The exposed SERT methodology follows this description to align with the language in VM-20. However, the equity returns for scenarios 13-16 produced in the AAA ESG have a delayed pop-up or pop-down. Discussions are expected to continue at public NAIC meetings regarding the SERT scenario methodology as applied in the new ESG.

Q15: The VM-20 ESG Field Test Template only has one tab for SERT scenario results for each VM-20 Reserve Category. However, my company would like to provide SERT results on both a pre- and post-reinsurance basis. What would be the best way to provide both pre- and post-reinsurance SERT results?

A15: To provide VM-20 SERT results on a pre- and post-reinsurance basis, please duplicate the Excel tab and add "pre" or "post" to the end of the tab name. For example, if your company wants to provide pre- and post-reinsurance results for the "Other" reserving category, duplicate the "VM-20 Other SERT" tab. Then, name one of the tabs "VM-20 Other SERT pre" and name the other tab "VM-20 Other SERT post". Other companies that are not providing both pre- and post-reinsurance SERT results should just provide the post-reinsurance values.

Q16: After reviewing the scenarios from the credit model in the Field Test in more detail, we would like to better understand how the GEMS credit model responds to changes in projected interest rates and equity returns.

Metrics used to analyze credit scenarios are as follows:

- **Distribution of credit excess returns (calculated as GWF for IG bond total returns / GWF for Gov bond total returns)**
- **Distribution of estimated credit spreads (taking the difference between annualized IG Bond and annualized Gov income returns)**

Our understanding from discussions with the Drafting Group was that GEMS' projected credit spreads / returns would be impacted by changes in projected interest rates and equity returns. We have observed several instances where the credit distributions do not behave as expected:

- **Credit distributions differ whenever the interest rate scenarios differ. I.e., Scen 1a credit <> Scen 2a credit. Scen 1a credit <> Scen 1b credit. The differences are relatively small, though**
- **Surprisingly, the credit distributions for the Conning calibrations are identical when the scenarios have identical interest rate distributions but significantly different equity distributions. I.e., Scen 1a credit = Scen 5a credit (= YE2021 rates using the GFF). Scen 2a credit = Scen 5b credit (= YE2019 + 200 bps rates using the GFF).**
- **There is an unexpected difference between Scen 6 and Scen 1a credit distributions even though the scenarios have identical interest rate distributions, and the only difference is equity. It's a slight difference at most percentiles, but it is more noticeable at the min/max and or over the first year. Why would equity affect credit in this case but not the others?**

Were there differences in how some scenario sets were generated for the field test vs. how it would be done in practice? If not, what is causing these dynamics?

A16: To make the Corporate model easier to calibrate, the linkage between Corporates and Equities is not based directly on the returns. Instead, like in the AIRG, the link is between the random numbers that drive these processes. Specifically, if the link was directly with equity returns, then a change in the expected equity return via adjusting the Fixed Risk parameter would force the User to fully recalibrate the Corporate model. By linking via the random numbers, there is no need to recalibrate the Corporate model with this type of change.

In terms of the multiple GEMS runs, those calibrations don't have any changes which affect the equity model's random number process. Changes like adjusting the **Initial Value** will impact the ultimate numbers for the variance, but not the random numbers themselves. This would be similar to changing the sigma parameters in the AIRG model: that will change

the equity returns, but not the generation of the random numbers. This is why the models that share the same Treasury parameters (e.g. Scen 1a and 5a) have the same Corporate results. The only calibration which changes this process is the ACLI's calibration (i.e. Run #6). Specifically, this calibration changes the correlation matrix between the equity indices which will change the ordering of the Large Cap Equity model's random numbers. While this should not have a huge impact on the Corporate model's distribution of results, it will be noticeable in percentile type calculations.