



Valuation Manual

Jan. 1, 2024 Edition

VM-31: PBR Actuarial Report Requirements for Business Subject to a Principle-Based Valuation

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Section 1: Purpose

The purpose of this section is to establish the minimum reporting requirements for policies or contracts subject to a principle-based valuation according to the methods defined in VM-20 and VM-21.

Section 2: General Requirements

- A. Each year a company shall prepare, under the direction of one or more qualified actuaries, as assigned by the company under the provisions of VM-G, a PBR Actuarial Report if the company computes a DR or a SR or performs an exclusion test for any policy as defined in VM-20, or computes an aggregate reserve for any contract as defined in VM-21.

A company that does not compute any deterministic or SR under VM-20 for a group of policies as a result of the policies in that group passing the exclusion tests as defined in VM-20 Section 6 must still develop a sub-report for that group of policies that addresses the relevant requirements of Section 3.

A company that computes reserves under the Alternative Methodology defined in VM-21 must still develop a sub-report with the applicable requirements to the Alternative Methodology for that group of policies that addresses the relevant requirements of Section 3.

The PBR Actuarial Report shall consist of an Executive Summary, a Life Summary, a Life Report, a VA Summary, and a VA Report, as applicable. The Life Report and the VA Report shall each contain one or more sub-reports, with each such sub-report covering one or more groups of policies, model segments or contracts. Each such sub-report shall be prepared by the qualified actuary assigned responsibility for such groups of policies or contracts under the provisions of VM-G. The PBR Actuarial Report must include documentation and disclosure sufficient for another actuary qualified in the same practice area to evaluate the work.

- B. The PBR Actuarial Report must include descriptions of all material decisions made and information used by the company in complying with the minimum reserve requirements and must comply with the minimum documentation and reporting requirements set forth in Section 3.
- C. The Executive Summary, Life Summary and VA Summary of the PBR Actuarial Report, as provided in Section 3.B, Section 3.C and Section 3.E, shall be submitted to the company's domiciliary commissioner no later than April 1 of the year following the year to which the PBR Actuarial Report applies. The entire PBR Actuarial Report, as provided by the entirety of Section 3, shall be submitted upon request to the company's domiciliary commissioner no later than April 1 of the year following the year to which the PBR Actuarial Report applies or within 30 days, if requested after April 1. Similarly, the company shall submit the entire PBR Actuarial Report or the Executive Summary, Life Summary and VA Summary upon request, to the commissioner of any other jurisdiction in which the company is licensed.

- D. The company shall retain on file, for at least seven years from the date of filing, sufficient documentation so that it will be possible to determine the procedures followed, the analyses performed, the bases for assumptions and the results obtained in a principle-based valuation.
- E. The PBR Actuarial Report shall be submitted in searchable portable document format (PDF) form, in which the narrative uses a font size no smaller than 10 point. However:
 - 1. This requirement shall in no way preclude the use of graphs and charts.
 - 2. As needed, large arrays of data should be submitted alongside the PDF file in the form of spreadsheets. The PDF document shall make specific reference to such accompanying files. Such companion files shall be considered part of the PBR Actuarial Report for regulatory review purposes.

Section 3: PBR Actuarial Report Requirements

- A. The PBR Actuarial Report shall contain a table of contents with associated page numbers. The PBR Actuarial Report shall retain and follow the order of the requirements listed herein. If only policies valued under VM-20 are included, then Section 3.E and Section 3.F are not applicable. If only contracts valued under VM-21 are included, then Section 3.C and Section 3.D are not applicable. The PBR Actuarial Report shall keep the corresponding headers for each requirement and include an explanatory statement for any requirement that is not applicable.
- B. Executive Summary – The PBR Actuarial Report shall contain a single Executive Summary at the beginning of the report which addresses all sub-reports. The Executive Summary shall include the following:
 - 1. Qualified Actuary – An opening paragraph identifying the qualified actuary that has been assigned by the company to prepare each sub-report of the PBR Actuarial Report, the qualifications of the qualified actuary and the relationship of the qualified actuary to the company.
 - 2. Groups of Policies and/or Contracts – A listing of the groups of policies valued under VM-20 and/or contracts valued under VM-21 covered by each sub-report.
 - 3. Policies – A summary of the base policies within each VM-20 reserving category. Include information necessary to fully describe the company’s distribution of business. For direct business, use PBR Actuarial Report Template A located on the NAIC website (https://www.naic.org/pbr_data.htm?tab_3) to provide descriptions of each base policy product type and underwriting process (including a description of the process, the time period in which it was used, and the level of any additional margin), with a breakdown of policy count and face amount by base policy product type and underwriting process. Also include the target market, primary distribution system, and key product features that affect risk, including conversion privileges.
 - 4. Contracts – A description of the contracts valued under VM-21, including descriptions of the target market, primary distribution system, and key product features that affect risk, such as death benefit guarantees, living benefit guarantees, or any other guarantees.
 - 5. High-Level Results – Summarized separately for business valued under VM-20 and business valued under VM-21, for the current and prior year, and on both a pre- and post-reinsurance-ceded basis, a table of the final reported reserve amounts, policy or contract counts, face amounts (for policies under VM-20) or in-force account values (for contracts under VM-21) and any other metrics helpful for the understanding of the company’s overall

level of reserves under a principle-based valuation. A template is provided below for reference.

	Post-Reinsurance-Ceded		Pre-Reinsurance-Ceded	
	Current Year (YYYY)	Prior Year (YYYY-1)	Current Year (YYYY)	Prior Year (YYYY-1)
Life Insurance valued under VM-20				
- Total VM-20 Reserve				
- Face Amount			N/A	N/A
- Policy Count			N/A	N/A
VA valued under VM-21				
- Total VM-21 Reserve				
- Account Value			N/A	N/A
- Contract Count			N/A	N/A

Guidance Note: Since AG 43 references the reserve requirements of VM-21, any contracts within the scope of AG 43 are considered to be valued under VM-21, and they should be documented as such within this PBR Actuarial Report.

C. Life Summary – The PBR Actuarial Report shall contain a Life Summary of the critical elements of all sub-reports of the Life Report as detailed in Section 3.D. In particular, this Life Summary shall include:

1. VM-20 Materiality – The standard established by the company pursuant to VM-20 Section 2.H.
2. Monitored Risks and Findings or Concerns – A summary of:
 - a. The material risks within the principle-based valuation under VM-20 and other risks that are subject to close monitoring by the board, the company, the qualified actuary, or any state insurance regulators in jurisdictions in which the company is licensed.
 - b. Any significant unresolved issues regarding the principle-based valuation under VM-20 in accordance with VM-G Section 4.A.5.

Guidance Note: Risks that are subject to close monitoring include items pursuant to VM-G Section 3.A that necessitate a heightened degree of oversight for the implementation or ongoing operation of the principle-based valuation function under VM-20. These may include risks relating to a process, procedure, control or resource. An example might be that the company is closely monitoring the adequacy of resources and level of knowledge for PBR.

3. Changes in Reserve Amounts – A description of the changes in reserve amounts from the prior year to the current year and why the changes are reasonable.
4. Changes in Methods – A description of any significant changes from the prior year in the methods used to model cash flows or other risks, or used to determine assumptions and margins, and the rationale for the changes.
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 future hedging strategies supporting the policies and any material changes to the hedging strategies from the prior year.

6. Consistency between Life Sub-Reports – A brief description of any material differences in methods, assumptions or risk management practices between groups of policies covered in separate Life sub-reports, to the extent that they are not explained by variations in product features, and the rationale for such differences.
 7. Governance – A statement indicating that governance documentation, including that required by VM-G Section 2.A.5, VM-G Section 3.A.6 and VM-G Section 4.A.3, is available upon request.
 8. Closing Section – A closing section with the signature, credentials, title, telephone number and e-mail address of the qualified actuary (or qualified actuaries) responsible for the Life Summary, the company name and address, and the date signed.
 9. Supplement Part 1 – A copy of Part 1 of the VM-20 Reserves Supplement from the annual statement blank.
 10. Supplement Part 2 – A copy of Part 2 of the VM-20 Reserves Supplement from the annual statement blank.
 11. Reconciliation of Reported Values – A reconciliation of reported values and an explanation of differences, if any, between reported values in Section 3.B.5 (High-Level Results), in the VM-20 Reserves Supplement – Part 1A and Part 1B, and in the Annual Statement (Exhibit 3 for Separate Account values, Exhibit 5 for General Account values, and any other).
- D. Life Report – This subsection establishes the Life Report requirements for individual life insurance policies valued under VM-20.

The company shall include in the Life Report and in any sub-report thereof:

1. Assumptions and Margins – Details on the valuation assumptions and margins, including:
 - a. Tables – For each material risk, the anticipated experience assumptions, margins, and prudent estimate assumptions used in the model, provided in Excel format. A complete table of reinsurance premiums is not required. If applicable, provide upon request a sample calculation demonstrating the methodology used to determine future reinsurance premiums reflecting non-guaranteed reinsurance features, including margins and details of any simplifications and approximations used.

Guidance Note: See VM-20 Section 9.B.1 for a discussion on material risks. There is a Sample Assumptions Summary for PBR Actuarial Report located on the NAIC website (https://www.naic.org/pbr_data.htm?tab_3), which may be a useful reference document when developing reporting in accordance with Section 3.D.1.a. For valuation dates prior to Dec. 31, 2022, the company's domiciliary commissioner may permit less than full compliance with the above Section 3.D.1.a, provided that the commissioner determines that the company has made a good faith attempt to comply.

- b. Changes – A description of any changes in anticipated experience assumptions or margins since the last PBR Actuarial Report.
- c. Company Experience Studies – The following information for each risk factor, provided using PBR Actuarial Report Template C provided on the NAIC website (https://content.naic.org/pbr_data.htm): the type(s) of policies included by VM-20 reserving category, the year the most recent experience study was

performed, along with the observation calendar years, the policy issue years included, and the length of the lag time used to allow for events reported after the study period.

- d. Assumption and Margin Development – The following information for each risk factor: description of the methods used to determine anticipated experience assumptions and margins, including the sources of experience (e.g., company experience, industry experience, or other data); how changes in such experience are monitored; any adjustments made to increase mortality margins above the prescribed margin (such as to reflect increased uncertainty due to newer underwriting approaches); and any other considerations, such as conversion features, helpful in or necessary to understanding the rationale behind the development of assumptions and margins, even if such considerations are not explicitly mentioned in the *Valuation Manual*.
2. Cash-Flow Models – The following information regarding the cash-flow model(s) used by the company in performing a principle-based valuation under VM-20:

- a. Modeling Systems – Description of the modeling system(s) used for both assets and liabilities. Each description should include identification of the model vendor when external, identification of the model version number, discussion of the degree of customization in the model, and discussion of the extent and function of supporting tools (e.g., pre-processing or post-processing in a spreadsheet or database software). If more than one modeling system is used, a description of how the modeling systems interact.
- b. Model Segments – Description and rationale for the organization of the policies and assets into model segments, consistent with the guidance from VM-20 Section 7.A.1.b and VM-20 Section 7.D.2.
- c. Grouping within Model Segments (Deterministic) – Description of the approach and rationale used to group assets and policies for the DR calculation within each model segment.

A clear indication shall be provided of how the company met the requirements of Section 2.G of VM-20 with respect to the grouping of policies. It shall be documented that, upon request, information may be obtained that is adequate to permit the audit of any subgroup of policies to ensure that the reserve amount calculated using a seriatim (policy-by-policy) liability model produces a reserve amount not materially higher than the reserve amount calculated using the grouped liability model.

- d. Grouping within Model Segments (Stochastic) – Description of the approach and rationale used to group assets and policies for the SR calculation within each model segment if different from the approach used in paragraph 2.c.
- e. Calculation and Model Validation – Description of the approach used to validate model calculations for NPR, DR and SR, including:
 - i. How the model was evaluated for appropriateness and applicability, including a thorough explanation of how the company became comfortable with the model (e.g., specific model controls, independent reviews performed, etc.).
 - ii. How the model results compare with actual historical experience.

- iii. Tables showing numerical static and dynamic validation results, and commentary on these results.
 - iv. Which risks, if any, are not included in the model.
 - v. Any limitations of the model that could materially impact the NPR, DR or SR.
 - f. Projection Period – Disclosure of the length of projection period and comments addressing the conclusion that the projection of cash flows extends far enough into the future that no obligations remain for both the deterministic and stochastic models.
 - g. Reinsurance Cash Flows – Description of how reinsurance cash flows are modeled.
 - h. Deterministic Reserve Method – Identification of the DR method applied for each model segment, either the gross premium valuation method outlined in VM-20 Section 4.A or the direct iteration method outlined in VM-20 Section 4.B.
3. Mortality – The following information regarding the mortality assumptions used by the company in performing a principle-based valuation under VM-20:
- a. Mortality Segments – Description of each mortality segment and the rationale for selecting the policies to include in each mortality segment.
 - b. Company Experience – If company experience is used, a description and summary of the company experience mortality rates for each mortality segment, including a summary of the company experience mortality rates for any aggregate class that mortality rates are based on pursuant to VM-20 Section 9.C.2.d.
 - c. Industry Tables – Description of the industry basic table used for each mortality segment, including:
 - i. For mortality segments where industry basic tables are used in lieu of company experience at all durations, a discussion of why company experience data is limited or unavailable and the rationale for the choice of industry basic table to the extent not covered in Section 3.D.3.e and Section 3.D.3.f below.
 - ii. For mortality segments where company experience with margins is graded to industry basic table with margins per VM-20 Section 9.C.7.b, the rationale for the choice of industry basic table to the extent not covered in Section 3.D.3.e and Section 3.D.3.f below.
 - d. Aggregate Company Experience – If the company bases mortality rates on more aggregate company experience pursuant to VM-20 Section 9.C.2.d:
 - i. Documentation that when the mortality segments are weighted together, the total amount of expected claims is not less than the aggregate company experience data for the group.
 - ii. If underwriting processes are treated similar pursuant to VM-20 Section 9.C.2.d.iii, a description, summary and citation of the third-party proprietary experience studies or published medical, clinical or other published studies used to support the expectations regarding mortality. The full reports and analyses for any third-party proprietary experience

studies shall be submitted upon request, considered part of the PBR Actuarial Report, and kept confidential to the same extent as is prescribed by law with respect the rest of the PBR Actuarial Report.

- iii. If underwriting processes are treated similar pursuant to VM-20 Section 9.C.2.d.iv, a description, explanation and summary of results for the most recent retrospective demonstration.
- e. Relative Risk Tool – Description, rationale and results of applying the Relative Risk Tool to select the industry basic table(s), and a summary of the analysis performed to evaluate the relationship between the Relative Risk Tool and the anticipated mortality established for mortality segments where the mortality assumption is affected by the application of the Relative Risk Tool. If underwriting-based justification not involving the Relative Risk Tool is being applied, provide similar analysis applicable to the company's methods.
- f. Alternative Data Sources – If company experience mortality rates for any mortality segment are not based on the experience directly applicable to the mortality segment (whether or not the data source is from the company), a summary containing the following:
 - i. The source of data, including a detailed explanation of the appropriateness of the data, and the underlying source of data, including how the company experience mortality rates were developed, graduated and smoothed.
 - ii. Similarities or differences noted between policies in the mortality segment and the policies from the data source (e.g., type of underwriting, marketing channel, average policy size, etc.).
 - iii. Adjustments made to the experience mortality rates to account for differences between the mortality segment and the data source.
 - iv. The number of deaths and death claim amounts by major grouping and including: age, gender, risk class, policy duration and other relevant information.
- g. Adjustments to Company Experience Mortality – If the company makes adjustments to company experience mortality rates:
 - i. Rationale for the adjustments.
 - ii. For adjustments due to changes in risk selection and/or underwriting practices, a description, summary and citation of the published medical, clinical or other published studies used to support the adjustments, including rationale and support for use of the study (or studies).
 - iii. Documentation of the mathematics used to adjust the mortality.
 - iv. Summary of any other relevant information concerning adjustments to the experience mortality, including the removal of policies insuring impaired lives and those for which there is a reasonable expectation, due to conditions such as changes in premiums or other policy provisions, that policyholder behavior will lead to mortality results that vary significantly from those that would otherwise be expected.

- h. Credibility – The following items related to credibility:
 - i. Identification of the method used to determine credibility percentage(s) for the company's mortality exposure period, including a listing of the credibility percentage that was used in VM-20 Section 9.C.7.b for each mortality segment, and an indication of whether each such credibility percentage was determined at the mortality segment level or at a higher level using aggregate mortality experience.
 - ii. A statement confirming that the credibility level was calculated using the data from the company's mortality experience study, based on uncapped amounts of insurance.
 - iii. For each credibility percentage that was used in VM-20 Section 9.C.6.b, the numerical values of all credibility formula inputs, along with calculation steps. For the Limited Fluctuation Method, this shall include r , z , m , σ , and the resulting value of Z . For the Bühlmann Empirical Bayesian Method, this shall include A , B , C , and the resulting value of Z .
- i. Mortality Improvement – Description of and rationale for the mortality improvement assumptions applied up to the valuation date and the mortality improvement assumptions applied 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).
- j. Mortality for Converted Policies – Description of the treatment of mortality for policies issued under group or term conversion privileges including:
 - i. A description of the method(s) by which any excess conversion mortality was taken into account in the development of company experience mortality rates (e.g., through the use of separate mortality segments for policies issued upon conversion, through aggregation of claim experience, or through use of other methods), the rationale for the method(s) used, and any changes in the method(s) from those used in previous years.
 - ii. The source(s) of the data used in the method(s) employed.
- k. Mortality for Impaired Lives or Policyholder Behavior – Disclosure of:
 - i. the percentage of business that is on impaired lives;
 - ii. whether impaired lives were included or excluded from the mortality study upon which company experience mortality was based; and
 - iii. whether any adjustments to mortality assumptions for impaired lives or policyholder behavior were found to be necessary and, if so, the rationale for the adjustments that were used.

Item (iii) above is a required disclosure for post-level term mortality assumptions even if the company uses a 100% shock lapse assumption, since it pertains to the analysis demonstrating whether there are post-level term profits.

- l. Setting Prudent Estimate Assumptions for Mortality – If company experience is used, a summary of the approach used to determine the final set of prudent estimate assumptions for mortality, including:
 - i. The start and ending period of time used to grade company experience to the industry basic table, including the approach used to grade company experience mortality rates to the industry table for advanced ages (attained age 100 and up).
 - ii. Description and results of any smoothing technique used.
 - iii. Description of any adjustments that were made to ensure reasonable relationships are maintained between mortality segments that reflect the underwriting class or risk class of each mortality segment.
 - iv. Description and justification of the mortality rates the company actually expects to emerge, and a demonstration that the anticipated experience assumptions are no lower than the mortality rates that are actually expected to emerge. The description and demonstration should include the level of granularity at which the comparison is made (e.g., ordinary life, term only, preferred term, etc.). For the mortality rates that are actually expected to emerge, the description should include a forward-looking qualitative analysis which includes, but is not limited to, the discussion of any underwriting standard changes (or lack thereof), distribution channel changes (or lack thereof), any pandemic adjustments (or lack thereof), and the results of ongoing experience monitoring.
 - m. Actual to Expected Mortality Analysis – Summary of the results of an actual to expected (without margins) analysis at least once every three years, or, for mortality segments for which mortality rates are based on more aggregate company experience pursuant to VM-20 Section 9.C.2.d.vi, at least annually for each individual mortality segment separately until such a time as the estimated change in expected mortality has been shown to be stable and unlikely to change based on further review. For the purposes of this analysis, the expected mortality shall be that last determined under VM-20 Section 9.C.2.e.
 - n. Adjustments to NPR Mortality – Description and rationale of any adjustments made to the CSO mortality rates used in the NPR calculation to reflect the requirements of VM-20 Section 3.C.1.g.
 - o. Adjustments to Prescribed Margins - Description and rationale for any adjustments made to prescribed mortality margins pursuant to VM-20, Section 9.C.6.d or Section 9.C.6.e.
4. Policyholder Behavior – The following information regarding each policyholder behavior assumption used by the company in performing a principle-based valuation under VM-20:
 - a. Data Reliability – Discussion of the reliability of the data and an explanation of why the data is reasonable and appropriate for this purpose.
 - b. Sparse Data – Explanation of how assumptions were determined for periods that were based on less than fully credible or relevant data.
 - c. Actual to Expected Policyholder Behavior Analysis – The results of the most recently available actual to expected (without margins) analysis, including:

- i. Definitions of the expected basis used in all actual-to-expected ratios shown.
 - ii. Comments addressing the conclusions drawn from the analysis.
- d. Margins and Sensitivity Tests – Rationale for the particular margins used and a description of testing performed to determine the size and direction of the margins by duration, including how the results of sensitivity tests were used in connection with setting the margins.
- e. Impact of Non-guaranteed Elements – How changes in NGE affect the policyholder behavior assumptions.
- f. Scenario-Dependent Dynamic Formulas – Description of any scenario-dependent dynamic formula.
- g. Changes from Prior Year – Changes in anticipated experience assumptions and/or margins since the last PBR Actuarial Report.
- h. Flexible Premiums – For policies that give policyholders flexibility in timing and amount of premium payments, the results of sensitivity tests related to the following premium payment patterns: minimum premium payment, no further premium payment, pre-payment of premium assuming a single premium and pre-payment of premiums assuming level premiums.
- i. Anti-Selective Lapses – Specific to lapses, a description of and rationale regarding adjustments to lapse and mortality assumptions to account for potential anti-selection.
- j. Competitor Rates – Competitor rate definition and usage.
- k. Post-Level Term Testing – For products with a level term period:
 - i. Summary results of the seriatim comparison of the present value of post-level term cash inflows and outflows for the DR as required by VM-20 Section 9.D.6.
 - ii. If this comparison showed that there were post-level term profits, describe how anti-selection was handled in the post-level term period, including the prudent estimate premium, mortality and lapse assumptions used.
 - iii. If the comparison showed that there were post-level term losses, confirm that the prudent estimate premium, mortality and lapse assumptions for the post-level period were addressed in Section 3.D.1.a and were used in the reserve calculation.
- l. Term Conversions – Description of how the company reflects the impact of any term conversion privilege contained in the policy.
- m. Lapse Rates for Converted Policies – Description of and rationale for lapse rates used for policies issued under any group or term conversion privilege.

5. Expenses – The following information regarding the expense assumptions used by the company in performing a principle-based valuation under VM-20:
- a. Allocating Expenses to PBR Policies – Methodology used to allocate expenses to the individual life insurance policies subject to a principle-based valuation under VM-20, and a statement confirming that expenses have been fully allocated in accordance with VM-20 Section 9.E.1.i.
 - b. Allocating Expenses to Model Segments – Methodology used to apply the allocated expenses to model segments or sub-segments within the cash-flow model.
 - c. Commissions and Acquisition Expenses – One of the following statements, as applicable, confirming the company’s treatment of commissions and acquisition expenses pursuant to VM-20 Sections 7.B.1.e and 9.E.1.m:
 - i. There are no future commissions or acquisition expenses associated with business in force as of the valuation date; therefore, none are included in the model.
 - ii. There are future commissions and acquisition expenses associated with business in force as of the valuation date, and these have been provided in response to Section 3.D.1.a.
 - iii. There are future commissions associated with business in force as of the valuation date, and these have been provided in response to Section 3.D.1.a. There are no future acquisition expenses associated with business in force as of the valuation date; therefore, none are included in the model.
 - iv. There are future acquisition expenses associated with business in force as of the valuation date, and these have been provided in response to Section 3.D.1.a. There are no future commissions associated with business in force as of the valuation date; therefore, none are included in the model.
 - d. Spreading of Costs – Identification of types of costs that were spread, and for how many years, if any cost spreading was done pursuant to VM-20 Section 9.E.1.b.
 - e. Expense Margins – Methodology used to determine margins.
 - f. Inflation – Assumed rate(s) of inflation and the underlying rationale/derivation, including any consideration given to making distinctions between short term and long term inflation rates.
 - g. Actual to Expected Analysis – The results of the most recently available actual to expected (without margins) analysis, including:
 - i. Definitions of the expected basis used in all actual-to-expected ratios shown.
 - ii. Comments addressing the conclusions drawn from the analysis.
6. Assets – The following information regarding the asset assumptions used by the company in performing a principle-based valuation under VM-20:

- a. Starting Assets – The amount of starting assets supporting the policies subject to a principle-based valuation under VM-20, and the method and rationale for determining such amount.
- b. Asset Selection – Method used and rationale for selecting the starting assets and apportioning the assets between the policies subject to a principle-based valuation under VM-20, and those policies not subject to principle-based valuation under VM-20.
- c. Asset Segmentation – Method used and rationale for allocating the total asset portfolio into multiple segments, if applicable.
- d. Asset Description – Description of the starting asset portfolio, including the types of assets, duration and their associated quality ratings.
- e. Market Values – Method used to determine projected market value of assets (if needed for assumed asset sales).
- f. Risk Management – Detailed description of model risk management strategies, such as hedging and other derivative programs, including any future hedging strategies supporting the policies and any adjustments to the SR pursuant to VM-20, Section 7.K3 and VM-20, Section 7.K.4, specific to the groups of policies covered in this sub-report and not discussed in the Life Summary Section 3.C.5. Documentation of any future hedging strategies should include documentation addressing each of the CDHS documentation attributes. The following should be included in the documentation:
 - 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.
 - iv. 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.
 - v. Hedge Modeling – Description of how the hedge strategy was incorporated into modeling, including:
 - Differences in timing between model and actual strategy implementation.
 - For a company that does not have a future hedging strategy supporting the contracts, confirmation that currently held hedge assets were included in the starting assets.
 - 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.
 - Discussion of the projection horizon for the future hedging strategy as modeled and a comparison to the timeline for any anticipated future changes in the company's hedging strategy.
 - 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.
 - Any discontinuous hedging strategies modeled, and where such discontinuous hedging strategies contribute materially to a reduction in the SR, 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.

- The approach and rationale used to reflect the hedge modeling error(s).
- g. Foreign Currency Exposure – Analysis of exposure to foreign currency fluctuations.
 - h. Maximum Net Spread Adjustment Factor – Summary of the results of the steps for determining the maximum net spread adjustment factor for each model segment, including the method used to determine option adjusted spreads for each existing asset.
 - i. Net Asset Earned Rate – For each model segment’s DR: If the gross premium valuation method outlined in VM-20 Section 4.A was used, a listing or graph of the path of calculated NAER for all years of the projection and an explanation of any abnormally high or low NAER values or unusual patterns over time.
 - j. Investment Expenses – Description of the investment expense assumptions.
 - k. Prepayment, Call and Put Functions – Description of any prepayment, call and put functions.
 - l. Asset Collar – If required under the criteria described in VM-20 Section 7.D.3, documentation that supports the conclusion that the modeled reserve is not materially understated as a result of the estimate of the amount of starting assets.
 - m. Residual Risks and Frictional Costs – With respect to modeling of derivative programs if a company assumes that residual risks and frictional costs have a value of zero, a demonstration that a value of zero is an appropriate expectation.
 - n. Policy Loans – Description of how policy loans are modeled, including documentation that if the company substitutes assets that are a proxy for policy loans, the modeled reserve produces reserves that are no less than those produced by modeling existing loan balances explicitly.
 - o. General Account Equity Investments – Description of an approach and rationale used to group general account equity investments, including an analysis of the proxy construction process that establishes the relationship between the investment return on the proxy and the specific equity investment category.
 - p. Separate Account Funds – Description of the approach and rationale used to group separate account funds and subaccounts, including analysis of the proxy construction process that establishes a firm relationship between the investment return on the proxy and the specific variable funds.
 - q. Mapping Stochastic Economic Paths to Fund Performance – Description of method to translate stochastic economic paths into fund performance.
 - r. Modeled Company Investment Strategy and Reinvestment Assumptions – Description of the modeled company investment strategy (before comparison to the alternative investment strategy), including asset reinvestment and disinvestment assumptions, and documentation supporting the appropriateness of

the modeled company investment strategy compared to the actual investment policy of the company.

- s. Alternative Investment Strategy – Documentation demonstrating compliance with VM-20 Section 7.E.1.g, showing that the modeled reserve is the higher of that produced using the modeled company investment strategy and the alternative investment strategy.
 - t. Number of Scenarios – Number of scenarios used for the SR and the rationale for that number.
 - u. Scenario Reduction Techniques – If a scenario reduction technique is used, a description of the technique and documentation of how the company determined that the technique meets the requirements of Section 2.G of VM-20.
7. Revenue-Sharing Assumptions – The following information regarding the revenue-sharing assumptions used by the company in performing a principle-based valuation under VM-20:
- a. Agreements and Guarantees – Description of revenue-sharing agreements and the nature of any guarantees underlying the revenue-sharing income included in the projections, including: the terms and limitations of the agreements; relationship between the company and the entity providing the revenue-sharing income; benefits and risk to the company and the entity providing the revenue-sharing income of continuing the arrangement; the likelihood that the company will collect the revenue-sharing income during the term of the agreement; the ability of the company to replace the services provided by the entity providing the revenue-sharing income; and the ability of the entity providing the revenue-sharing income to replace the service provided by the company.
 - b. Amounts Included – The amount of revenue-sharing income and a description of the rationale for the amount of revenue-sharing income included in the projections, including any reduction for expenses.
 - c. Revenue-Sharing Margins – The level of margin in the prudent estimate assumptions for revenue-sharing income and description of the rationale for the margin for uncertainty. Also, a demonstration that the amounts of net revenue-sharing income, after reflecting margins, do not exceed the limits set forth in VM-20, Section 9.G.8.
8. Reinsurance – The following information regarding the reinsurance assumptions used by the company in performing a principle-based valuation under VM-20:
- a. Agreements – For those reinsurance agreements included in the calculation of the minimum reserve as per VM-20 Section 8.A, a description of each reinsurance agreement, including, but not limited to, the type of agreement, the counterparty, the risks reinsured, any provisions related to converted policies, the portion of business reinsured, identification of both affiliated and non-affiliated, as well as captive and non-captive, or similar relationships, and whether the agreement complies with the requirements of the credit for reinsurance under the terms of the AP&P Manual.
 - b. Assumptions – Description of reinsurance assumptions used to determine the cash flows included in the model.

- c. Separate Stochastic Analysis – To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk of the company, a description of the separate stochastic analysis that was used outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The description should include which variables are modeled stochastically.
 - d. Multiple Agreement Allocation Method – If a policy is covered by more than one reinsurance agreement, description of the method to allocate reinsurance cash flows from each agreement.
 - e. Counterparty Assets – Pursuant to VM-20 Section 8.C.14, if the company concludes that modeling the assets supporting reserves held by a counterparty is not necessary, documentation of the testing and logic leading to that conclusion.
 - f. Pre-Reinsurance-Ceded Minimum Reserve – Description and rationale for methods and assumptions used in determining the pre-reinsurance-ceded minimum reserve that differ from methods and assumptions used in determining the minimum reserve (post-reinsurance-ceded), including support that such methods and assumptions are consistent with VM-20 Section 8.D.2.
 - g. Phase-In: If electing a phase-in period as described in VM-20 Section 8.C, documentation of the length of the phase-in approved by the company's domiciliary commissioner, the result of the current and prior methodologies, the weights applied to each result, and confirmation that reinsurance assumptions for the calculation of the prior methodology are discussed in Section 3.D.8.b above.
9. Non-guaranteed Elements – The following information, where applicable, regarding the NGE assumptions used by the company in performing a principle-based valuation under VM-20:
- a. Modeling – Description of the approach used to model NGEs, including a discussion of how future NGE amounts were adjusted in scenarios to reflect changes in experience and including how lag in timing of any change in NGE relative to date of recognition of change in experience was reflected in projected NGE amounts.
 - b. NGE Margins – Description of the approach to establish a margin for conservatism, if applicable.
 - c. Past Practices and Policies – Description of how the company's past NGE practices and established NGE policies were reflected in projected NGE amounts, including a discussion of the impact of interest rates or other market factors on past and projected premium scales, cost of insurance scales, and other NGEs.
 - d. Consistency – Description of the following: (i) whether and how projected levels of NGEs in the model are consistent with experience assumptions used in each scenario; and (ii) whether and how policyholder behavior assumptions are consistent with the NGE assumed in the model.
 - e. Conditional Exclusion – State if and how the provision in Section 7.C.5 of VM-20 allowing conditional exclusion of a portion of an NGE is used.
 - i. If used, discuss whether the provision is used for any purpose other than recognition of subsidies for participating business.

- ii. If used, discuss how prevention of double counting of assets is ensured.

Guidance Note: Examples of considerations include: (1) if the subsidy is provided by a downstream company, and the carrying value of the downstream company is reported as an asset on the company's books, where is the offsetting liability reported; or (2) if the subsidy is provided by another block of business within the company, is the subsidy included in cash-flow testing of the "other block."

- f. Interest Crediting Strategy – Description of interest crediting strategy.
 - g. Interest Bonus – Description of any interest bonuses included in the model.
10. Exclusion Tests – The following information regarding the deterministic and stochastic exclusion tests, if calculated:
- a. Exclusion Test Policies – Identification and description of each group of policies using the deterministic and stochastic exclusion tests, including contract type and risk profile, and rationale for each grouping of policies.
 - b. Type of Stochastic Exclusion Test – Identification of each group of policies that the company elects to exclude from SR requirements and the SET used (passing the SERT or stochastic exclusion demonstration test, or certification that the group of policies does not contain material interest, tail or asset risk). For any group of policies for which a prior year's result is being invoked as to the passing of the stochastic exclusion demonstration test or the certification that policies are not subject to material interest rate risk, a statement indicating which prior year's result it was.
 - c. Stochastic Exclusion Ratio Test – For groups of policies for which the SERT is used, the following data on a post-reinsurance-ceded basis calculated in accordance with VM-20 Section 6.A.2 and on a pre-reinsurance-ceded basis calculated in accordance with VM-20 Section 8.D.2:
 - i. The adjusted DR for each of the 16 scenarios.
 - ii. The values of a, b and c.
 - iii. The value of the test ratio $(b - a)/c$.
 - d. Stochastic Exclusion Demonstration Test – For groups of policies for which the stochastic exclusion demonstration test is used, the rationale for using the demonstration test, identification of which acceptable demonstration method listed under VM-20 Section 6.A.3.b was applied or a statement that another method acceptable to the commissioner was applied, and the details of the demonstration supporting the exclusion in the initial exclusion year and at least once every three calendar years subsequent to the initial exclusion year.
 - e. SET Certification Method – For groups of policies for which the SET certification method is used, support for the certification including supporting analysis and tests.
 - f. Fallback Results – If the stochastic exclusion demonstration test or the certification method was successfully used for any group of policies for which the SERT was initially attempted but failed, the company shall so indicate and show the unsuccessful SERT results.

Similarly, if the Stochastic Exclusion Ratio Test was successfully used for any group of policies for which the stochastic exclusion demonstration test under the method of VM-20 Section 6.A.3.b.iii or VM-20 Section 6.A.3.b.iv was initially attempted but failed, the company shall so indicate and show the results of the unsuccessful stochastic exclusion demonstration test.

- g. Deterministic Net Premium Test – For groups of policies for which the Deterministic Net Premium Test is performed, the results of the Deterministic Net Premium Test for each group of policies.
- h. DET Certification Method – For groups of policies for which the DET certification method is used, support for the certification, including policy counts, reserve amounts and their corresponding location in Exhibit 5 of the Annual Statement, methodology, supporting analysis, and tests.

11. Additional Information – The following additional information:

- a. Impact of Margins for Each Risk Factor – For each group of policies for which a separate DR is calculated, the impact of margins on the DR for each risk factor, or group of risk factors, that has a material impact on the DR, determined by subtracting (i) from (ii):
 - i. The DR for that group of policies, but with the reserve calculated based on the anticipated experience assumption for the risk factor and prudent estimate assumptions for all other risk factors.
 - ii. The DR for that group of policies as reported.

Guidance Note: Pursuant to VM-20, margins must increase the reserve, so the impact of each margin, as calculated by subtracting (i) from (ii) above, must be positive.

- b. Aggregate Impact of Margins – For each group of policies for which a separate DR is calculated, the aggregate impact of all margins on the DR for that group of policies determined by subtracting (i) from (ii):
 - i. The DR for that group of policies, but with the reserve calculated based on anticipated experience assumptions for all risk factors prior to the addition of any margins.
 - ii. The DR for that group of policies as reported.
- c. Impact of Implicit Margins – For purposes of the disclosures required in 11.a and 11.b above:
 - 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.
 - ii. Since the company is not required to determine an anticipated experience assumption or a prudent estimate assumption for risk factors that are prescribed for the DR (i.e., interest rates movements, equity performance,

default costs and net spreads on reinvestment assets), when determining the impact of margins, the prescribed assumption shall be deemed to be the prudent estimate assumption for the risk factor, and the company can elect to determine an anticipated experience assumption for the risk factor, based on the company's anticipated experience for the risk factor. If this is elected, the company shall document the rationale and method used to determine the anticipated experience assumption.

- d. Sensitivity Tests – For each distinct product type for which margins were established:
 - i. List the specific sensitivity tests performed for each risk factor or combination of risk factors.
 - ii. Indicate whether the reserve was calculated based on the anticipated experience assumptions or prudent estimate assumptions for all other risk factors while performing the tests.
 - iii. Provide the numerical results of the sensitivity tests.
 - iv. Explain how the results of sensitivity tests were used or considered in developing assumptions.

Guidance Note: If a model segment contains multiple distinct product types (e.g., ART, Level Term), (i) through (iv) should be done for each product type.

- e. Material Risks Not Fully Reflected – A description of material risks not fully reflected in the cash-flow model used to calculate the SR, including:
 - i. A description of each element of the cash-flow model for which this provision has been made in the SR (e.g., risk factors, policy benefits, asset classes, investment strategies, risk mitigation strategies, etc.).
 - ii. A description of the approach used by the company to provide for these risks in the SR outside the cash-flow model, a summary of the rationale for selecting this approach and the key assumptions justifying the underlying approach.
 - iii. If there is more than one model element included in this provision, clarifying whether a separate provision was determined for each element, or collectively for groups of two or more elements and explaining the methodology, supporting rationale and key assumptions for how separate provisions were combined.
- f. Allocation for DR – For each group of policies for which a DR is calculated and an allocation is performed as described in VM-20 Section 4.C, disclosure of the ratio (i) to (ii), in which the respective components are:
 - i. The DR for that group of policies as reported.
 - ii. The sum of the DR calculated separately for each VM-20 reserving category within that group of policies.
- g. Impact of Aggregation for SR – For each group of policies for which a SR is calculated, the impact of aggregation on the SR, including a discussion of material

risk offsets across different product types within a VM-20 reserving category that were modeled together.

- h. Calculations as of the Valuation Date – The following information:
 - i. A statement confirming that the NPR was calculated based on policies in force as of the valuation date.
 - ii. If the DR and/or SR were calculated as of the valuation date, a statement confirming that the calculations were based on the following items: policies in force, starting assets, and the starting yield curve as of the valuation date, and the prescribed Table A and Tables F through J in effect on the valuation date.
- i. Calculations as of a Date Preceding the Valuation Date – If the DR and/or SR were calculated as of a date preceding the valuation date (i.e., if the dates of any of the items listed in Section 3.D.11.h.ii preceded the valuation date):
 - i. The dates used for each item listed in Section 3.D.11.h.ii, separately for the DR and/or SR.
 - ii. A description of the methodology used to determine the adjustment required by VM-20 Section 2.E, along with the adjustment amount and an explanation that justifies why it produces a reserve that is not materially less than a reserve calculated as of the valuation date.
- j. Approximations, Simplifications, and Modeling Efficiency Techniques – A description of each approximation, simplification or modeling efficiency technique used in reserve calculations, and a statement that the required VM-20 Section 2.G demonstration is available upon request and shows that: 1) the use of each approximation, simplification, or modeling efficiency technique does not understate the reserve by a material amount; and 2) the expected value of the reserve is not less than the expected value of the reserve calculated that does not use the approximation, simplification, or modeling efficiency technique.
- k. Aggregate Impact of Approximations, Simplifications and Modeling Efficiency Techniques – Support that the aggregate impact of approximations and simplifications does not result in a material understatement of the reserve. This should include consideration of not just the magnitude of the sum of the individual impacts when considered in isolation, but also consideration of any potential interaction of approximations, simplifications, and modeling efficiency techniques.
- l. ULSG Detail – Breakdown of ULSG reserve results (NPR, DR and SR) into Variable UL, Indexed UL and regular UL components, both pre- and post-reinsurance, along with case counts and face amounts.

Any given UL policy is to be classified in its entirety as either Variable UL, Indexed UL or regular UL. If a ULSG policy satisfies the definition of a variable life insurance policy (even if it contains options for indexed funds or fixed funds), that policy should be classified as variable for this VM-31 reporting purpose. If it does not, but it satisfies the definition of an Indexed UL policy, it should be classified as Indexed.

- m. PIMR – Description of the methodology used to derive the PIMR balance on the projection start date and allocate it among the model segments, and the dollar amount of each such portion of PIMR.
12. Riders and Supplemental Benefits – The following information on the riders and supplemental benefits attached to the base policies is subject to VM-20:
- a. A brief description of the coverage provided and a list of the products to which the rider or supplemental benefit is attached.
 - b. Whether the rider or supplemental benefit has a separate premium or charge.
 - c. For the NPR, DR, and SR separately, an indication of whether the rider or supplemental benefit was valued with the base policy or separately, and a brief description of the valuation methodology used.
 - d. For the NPR, DR, and SR separately, whether the rider or supplemental benefit had a non-zero reserve and whether the reserve amount was included in the respective column of Part 1 of the VM-20 Reserves Supplement.
 - e. Any other information necessary to fully describe the company's riders and supplemental benefits and the reserve methodology used.
13. Reliance Descriptions and Statements – A description of those areas where the qualified actuary relied on others for data, assumptions, projections or analysis in performing the principle-based valuation under VM-20 and a reliance statement from each individual on whom the qualified actuary relied that includes:
- a. Reliance Listing – The name, title, telephone number, e-mail address and qualifications of the individual, along with the individual's company name and address, and the information provided.
 - b. Reliance Statements – A statement as to the accuracy, completeness or reasonableness, as applicable, of the information provided, along with a signature and the date signed.
14. Certifications
- a. Investment Officer on Investments – A certification from a duly authorized investment officer that the modeled company investment strategy, including any future hedging strategies supporting the policies, is representative of and consistent with the company's investment policy and that documentation of the CDHS attributes for any future hedging strategies supporting the policies are accurate.
 - 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 future hedging strategies supporting the policies is consistent with the company's actual future hedging strategies and 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.
 - c. Senior Management on Internal Controls – A certification from senior management, other than the qualified actuary, regarding the effectiveness of

internal controls with respect to the principle-based valuation under VM-20, as provided in Section 12B(2) of Model #820.

- d. Qualified Actuary on Interest Rate and Volatility Risks – Certification, by the qualified actuary assigned responsibility under VM-G for a group of policies that qualifies for exclusion from the requirement to calculate a SR under the provisions of VM-20, Section 6.A.1.a.iii, that this group of policies is not subject to material interest rate risk or asset return volatility risk.
 - e. Qualified Actuary on Accordance with VM-20 and Model #820 – Certification by the qualified actuary, for the groups of policies for which responsibility was assigned, that the principle-based valuation was performed in accordance with the requirements outlined in VM-20 and the relevant sections of Model #820.
 - f. Qualified Actuary on Assumptions and Margins – Certification by the qualified actuary, for the groups of policies for which responsibility was assigned, that the assumptions used in the principle-based valuation under VM-20, other than assumptions used for risk factors that are prescribed or stochastically modeled, are prudent estimate assumptions and the margins applied therein are appropriate.
 - g. Qualified Actuary on Conservatism of Converted Policies – Certification by the qualified actuary assigned responsibility under VM-G for a group of policies that qualifies for exclusion from the requirement to calculate a DR under the provisions of VM-20 Section 6.B.2.b, that the total reserve for this group of policies includes a prudent provision for the additional mortality associated with the conversion and reasonably exceed the value of a DR which otherwise would have been calculated for this group of policies.
15. Closing Paragraph – A closing paragraph with the signature, credentials, title, telephone number and e-mail address of the qualified actuary, the company name and address, and the date signed.
- E. VA Summary – The PBR Actuarial Report shall contain a VA Summary of the critical elements of all sub-reports of the VA Report as detailed in Section 3.F. In particular, this VA Summary shall include:
1. Materiality – The Standard established by the company pursuant to VM-21 Section 1.E.
 2. Material Risks – A summary of the material risks within the principle-based valuation under VM-21 subject to close monitoring by the board, the company, the qualified actuary, or any state insurance regulators in jurisdictions in which the company is licensed. Include any summary metrics used to monitor the risk, such as the level of ITM by benefit type as of the valuation date. Also, include any significant information required to be provided to the board pursuant to VM-G, such as elements materially inconsistent with the company's overall risk assessment processes.
 3. Changes in Reserve Amounts – A description of any material changes in reserve amounts from the prior year and an explanation for the changes, including the results of any supporting analysis such as an attribution analysis or waterfall chart. A table shall be attached to the summary, listing the aggregate reserve amount, reserve component amounts, and key statistics for the business valued under VM-21, including but not limited to the SR, additional standard projection amount, alternative methodology reserve, account values, cash surrender value, and contract count. A template is provided below for reference.

	Post-Reinsurance-Ceded		Pre-Reinsurance-Ceded	
	Current Year (YYYY)	Prior Year (YYYY-1)	Current Year (YYYY)	Prior Year (YYYY-1)
Total VM-21 Reserve				
Stochastic Reserve (SR)				
- SR Amount				
- CTE 70 (best efforts)				
- CTE 70 (adjusted)				
- E Factor			N/A	N/A
Standard Projections				
- Additional Standard Projection Amount				
- Prescribed Projections Amount				
- Unbuffered Additional Standard Projection Amount				
- Unfloored CTE 70 (adjusted)				
- Unfloored CTE 65 (adjusted)				
Alternative Methodology (AM)				
- AM Reserve				
- AM Reserve (without floor)				
- Cash Surrender Value Floor				
- Reserve Floor under AG 33				
Phase-In Components				
R1			N/A	N/A
R2			N/A	N/A
A			N/A	N/A
B			N/A	N/A
C			N/A	N/A
D				
Summary Statistics				
- Separate Account Value			N/A	N/A
- General Account Value			N/A	N/A
- Total Account Value			N/A	N/A
- Cash Surrender Value			N/A	N/A
- Contract Count			N/A	N/A
RBC Amount				
- CTE 98 (pre-tax)			N/A	N/A
- CTE 98 (post-tax)			N/A	N/A
- Effect of Phase-In			N/A	N/A
- Effect of Smoothing			N/A	N/A

4. Changes in Methods – A description of any significant changes from the prior year in the methods used to model cash flows or other risks, or used to determine assumptions and margins, and the rationale for the changes.

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 future hedging strategies supporting the contracts and any material changes to the hedging strategies from the prior year.
 6. Consistency between VA Sub-Reports – A brief description of any material differences in methods, assumptions, or risk management practices between groups of contracts covered in separate VA sub-reports, to the extent that they are not explained by variations in product features, and the rationale for such differences.
 7. Closing Section – A closing section with the signature, credentials, title, telephone number and e-mail address of the qualified actuary (or qualified actuaries) responsible for the VA Summary, the company name and address, and the date signed.
 8. Supplement Part 1 – A copy of Part 1 of the VA Supplement from the annual statement blank.
 9. Supplement Part 2 – A copy of Part 2 of the VA Supplement from the annual statement blank.
- F. VA Report – This subsection establishes the VA Report requirements for variable annuity contracts valued under VM-21.

The company shall include in the VA Report and in any sub-report thereof:

1. Liabilities – The following information regarding the liabilities included in the principle-based valuation under VM-21:
 - a. Product Descriptions – Description of key product features that impact risk, including mortality and expense (M&E) charges, death benefit guarantees, living benefit guarantees, and any premium or persistency bonuses, to the extent not discussed in Section 3.B.4.
 - b. Liability Data Source – Description of source(s) of liability data.
 - c. Alternative Methodology Scope – Identification of products whose reserve was determined using the Alternative Methodology, including description of their key product features (e.g., whether they contain no guarantee living or death benefits, or contain GMDBs only), total account value, and contract count.
2. Cash-Flow Models – The following information regarding the cash-flow model(s) used by the company in performing a principle-based valuation under VM-21:
 - a. Modeling Systems – Description of the modeling system(s) used for both assets and liabilities. If more than one modeling system is used, a description of how the modeling systems interact and how the results from different modeling systems are combined to determine the aggregate reserve.
 - b. Model Segments – Description and rationale for the organization of the contracts and assets into model segments, if any, as referenced in VM-21 Section 3.D.
 - c. Model Validation – Description of the approach used to validate model calculations within each model segment for the models used to determine the SR, including: how the models were evaluated for appropriateness and applicability; how the model results compare with actual historical experience; what, if any, risks

are not included in the models; the extent to which the correlation of different risks is reflected in the margins; and any material limitations of the models.

- d. Projection Period – Disclosure of the length of projection period and comments addressing the conclusion that no material amount of business remains at the end of the projection period for the models used to determine the SR.
 - e. Approximations, Simplifications, and Modeling Efficiency Techniques – A description of each approximation, simplification or modeling efficiency technique used in reserve or TAR calculations, and a statement that the required VM-21 Section 3.H demonstration is available upon request and shows that: 1) the use of each approximation, simplification, or modeling efficiency technique does not understate TAR by a material amount; and 2) the expected value of TAR is not less than the expected value of TAR calculated without using the approximation, simplification, or modeling efficiency technique.
 - f. Aggregate Impact of Approximations, Simplifications and Modeling Efficiency Techniques – Support that the aggregate impact of approximations and simplifications does not result in a material understatement of TAR. This should include consideration of not just the magnitude of the sum of the individual impacts when considered in isolation, but also consideration of any potential interaction of approximations, simplifications, and modeling efficiency techniques.
 - g. Model Cells – If a compressed liability model is used, as allowed by VM-21 Section 4.A.3, a statement that the assignment of contracts to model cells was not done in a manner that intentionally understates the resulting reserve. Also, upon request by the domiciliary commissioner, include information to permit the audit of any subgroup of contracts to ensure that the reserve amount calculated using a seriatim (contract-by-contract) liability model produces a reserve amount not materially higher than the reserve amount calculated using the compressed liability model.
 - h. Scenario Reserve Method – Identification of the method used to determine the scenario reserve, either (1) the method described in VM-21 Section 4.B.2 and VM-21 Section 4.B.3; or (2) the direct iteration method described in VM-21 Section 4.B.4.
3. Liability Assumptions and Margins – A listing of the assumptions and margins used in the projections to determine the SR, including a discussion of the source(s) and the rationale for each assumption:
- a. Premiums and Subsequent Deposits – Description of premiums and subsequent deposits.
 - b. Interest Crediting Strategy – Description of the interest crediting strategy.
 - c. Commissions – Description of commissions, including any commission chargebacks.
 - d. Expenses Other than Commissions – Description and listing of insurance company expenses other than commissions, such as overhead, including:
 - i. Method used to allocate expenses to the contracts included in a principle-based valuation under VM-21 and a statement confirming that expenses have been fully allocated in accordance with VM-21, Section 12.D.1.h.

- ii. Method used to apply the allocated expenses to model segments or sub-segments within the cash-flow model.
 - iii. Identification of the types of costs that were spread, and for how many years, if any cost spreading was done pursuant to VM-21, Section 12.D.1.a.
 - iv. Method used to determine margins.
- e. Partial Withdrawals – Description and listing of partial withdrawal rates, including treatment of dollar-for-dollar offsets on GMDBs and VAGLBs, and required minimum distributions.
- f. Lapses and Full Surrenders – Description and listing of lapse or full surrender rates, including:
 - i. For contracts with VAGLBs, two comparisons of actual to expected lapses where “expected” equals (1) anticipated experience assumptions used in the development of the SR; and (2) the assumptions used in the development of the additional standard projection amount, and the “actual” is separated by logical blocks of business, duration (e.g., during and after surrender charge period), ITM (consistent with dynamic assumptions), and age (to the extent that age affects the election of benefits lapse). These data shall be separated by experience incurred in the past year, the past three years, and all years.
 - ii. If experience for contracts without VAGLBs is used in setting lapse assumptions for contracts with in-the-money or at-the-money VAGLBs, then a detailed explanation of the appropriateness of the assumption and a demonstration of the relevance of the experience to the business.
- g. Annuitization Benefits – Description of assumptions for the purposes of projecting annuitization benefits (excluding annuitizations stemming from the election of a GMIB and withdrawal amounts from GMWBs, which are addressed in Section 3.F.3.h below), including:
 - i. Description and listing of assumptions regarding rates of annuitization.
 - ii. Description and listing of income purchase assumptions.
 - iii. Disclosure of any parameters not determined in a formulaic fashion in the projection of statutory reserve of payout annuity benefits in the future.
- h. GMIB and GMWB Utilizations – Description and listing of GMIB and GMWB utilization assumptions (such as rates and withdrawal/income amounts), including:
 - i. Formulas used to set the assumptions.
 - ii. Key parameters affecting the level of the assumption (e.g., age, duration, ITM, during and after the surrender charge period).
 - iii. Summary of utilization rates from various combinations of key parameters.
 - iv. Description of the experience data used to develop the assumptions, including the source, relevance and credibility of the experience data used.

- v. If relevant and credible data were not available, a discussion of how the assumption is consistent with the requirement that the assumption is to be on the conservative end of the plausible range of expected experience.
- vi. Discussion of the sensitivity tests performed to support the assumption.
- vii. Description of the method or approach adopted to model the assumptions, including a description of any simplifications applied to improve computational tractability, such as discarding developed cohorts.
- i. Mortality – Description of the mortality assumptions and margins for all segments, including:
 - i. Rationale for the grouping of contracts into different segments for the determination of mortality assumptions, and the type and quantity of business that constitutes each segment.
 - ii. Description of how each segment was determined to be a plus or minus segment, and results of sensitivity tests performed, if any.
 - iii. Summary of any mortality studies used to support mortality assumptions, including quantification of the exposures and corresponding deaths, description of the important characteristics of the exposures, and discussion of any unusual data points or trends.
 - iv. Description of the age of the experience data used to determine expected mortality curves and the relevance of the data.
 - v. Description of the credibility procedure, the statistical basis for the specific elements of the credibility procedure, and any material changes from prior credibility procedures.
 - vi. Description of the mathematics used to adjust mortality based on credibility, and summary of the result of applying credibility to the mortality segments.
 - vii. Discussion of any assumptions made on mortality improvements both for applying up to and beyond the valuation date (if applicable), the support for such assumptions, and how such assumptions adjusted the modeled mortality. In a case where mortality improvement as discussed in VM-21 Section 11.C and Section 11.D has not been applied, confirmation that applying such improvement would not result in an increase in the SR.
 - viii. Description of how the expected mortality curves compare to recent historic experience, and discussion of any differences.
 - ix. Discussion of how the mortality assumptions are consistent with the goal of achieving the required CTE level over the joint distribution of all future outcomes, in keeping with Principle 3 of VM-21.
 - x. If the study was done on a similar business segment, description of the differences in the business segment on which the data were gathered and the business segment on which the data were used to determine mortality assumptions for the principle-based valuation under VM-21, and how these differences were reflected in the mortality used in modeling.

- xi. If mortality assumptions were based in part on reinsurance rates, description of how the rates were used to set expected mortality (e.g., assumptions made on loadings in the rates and/or whether the assuming company provided their expected mortality and the rationale for their assumptions).
 - xii. For a plus segment, discussion of the examination of the mortality data for the underreporting of deaths and experience by duration, and description of any adjustments made as a result of the examination.
 - xiii. For a minus segment, discussion of how the mortality deviations on minus segments compare to those on any plus segments. To the extent that the overall margin is reduced, include support for this assumption.
- j. Contract Loans – Disclosure of whether contract loans are modeled, and if so, description of how they are modeled, including documentation that if the company substitutes assets that are a proxy for contract loans, the modeled reserve produces reserves that are no less than those produced by modeling existing loan balances explicitly.
- k. Actual to Expected Analysis – Disclosure of the results of the most recently available actual to expected (without margins) analysis for the assumptions including 3.F.3.d Expenses Other than Commissions, 3.F.3.e Partial Withdrawals, 3.F.3.g Annuitization Benefits and 3.F.3.h GMIB and GMWB Utilizations, including:
- i. Definitions of the expected basis used in all actual-to-expected ratios shown.
 - ii. Comments addressing the conclusions drawn from the analysis.
- l. Other Considerations – Description of any considerations helpful in or necessary to understanding the rationale behind the development of assumptions and margins, even if such considerations are not explicitly mentioned in the *Valuation Manual*.
4. Starting Assets – The following information regarding the starting assets used by the company in performing a principle-based valuation under VM-21, as it applies to the calculation of post-reinsurance-ceded amounts:
- a. Amount – The amount of starting assets, listed separately as separate account assets and general account assets, supporting the contracts valued under VM-21 at the start of the projections, and the method and rationale for determining such amounts.
 - b. Asset Description – Description of the starting general account asset portfolio, including the types of assets, terms to maturity, duration, and associated quality ratings for fixed income assets.
 - c. Hedge Assets – The value of hedge assets in the general account asset portfolio, and a description of currently held hedge positions.
 - d. Asset Selection – Method used and rationale for selecting the starting assets and apportioning the assets between the contracts valued under VM-21 and those contracts not valued under VM-21.
 - e. Asset Data Source – Description of source(s) of asset data.
 - f. Asset Valuation Basis – Description of the asset valuation basis.
 - g. PIMR – Discussion of the treatment of all PIMR considered for the purposes of the

principle-based valuation under VM-21, whether included or excluded, and rationale for the treatment.

5. Separate Account Assets – The following information regarding the separate account asset assumptions used by the company in performing a principle-based valuation under VM-21:
 - a. Investment / Fund Choice – Description of investment and/or fund choices, as well as fund fees.
 - b. Asset Allocation – Description of asset allocation, rebalancing and transfer assumptions, including any dollar cost averaging arrangements.
 - c. Grouping of Funds – Description of the approach and rationale used to group separate account funds and subaccounts.
6. General Account Assets – The following information regarding the general account asset assumptions used by the company in performing a principle-based valuation under VM-21:
 - a. Modeled Company Investment Strategy and Reinvestment Assumptions – Description of the modeled company investment strategy (before the comparison to the alternative investment strategy), including asset reinvestment and disinvestment assumptions, and documentation supporting the appropriateness of the modeled company investment strategy compared to the actual investment policy of the company.
 - b. Alternative Investment Strategy – Documentation demonstrating compliance with VM-21 Section 4.D.4.b showing that the SR is the higher of that produced using the modeled company investment strategy and the alternative investment strategy.
 - c. Grouping of Equity Investments – Description of the approach and rationale used to group general account equity investments.
 - d. Prepayment, Call and Put Functions – Description of any prepayment, call and put functions.
 - e. Investment Expenses – Description of the investment expense assumptions.
 - f. Market Values – Method used to determine projected market value of assets (if needed for assumed asset sales).
 - g. Foreign Currency Exposure – Analysis of exposure to foreign currency fluctuations.
 - h. Maximum Net Spread Adjustment Factor – Summary of the results of the steps for determining the maximum net spread adjustment factor, including the method used to determine option adjusted spreads for each existing asset.
 - i. Additional Assets – If the direct iteration method was not used, a summary of the amounts of additional assets needed to fund the present value of the accumulated deficiency, including a description of the calculation process and the types of assets included.
 - j. NAER – If the direct iteration method was not used, a description of the vectors of NAER, including graphs or tables of summary statistics helpful to the

understanding of the NAER vectors produced for each scenario, with a statement that a complete listing of NAER will be made available in electronic spreadsheet format upon request.

- k. Asset Risks Reflected – Discussion of any other asset risks reflected in the principle-based valuation under VM-21, as listed in VM-21 Section 1.C.2.a, not otherwise discussed in the VA Report.
7. Revenue-Sharing Assumptions – The following information regarding the revenue-sharing assumptions used by the company in performing a principle-based valuation under VM-21:
- a. Agreements and Guarantees – Description of revenue-sharing agreements and the nature of any guarantees underlying the revenue-sharing income included in the projections, including: the terms and limitations of the agreements; the relationship between the company and the entity providing the revenue-sharing income; the benefits and risk to the company and the entity providing the revenue-sharing income of continuing the arrangement; the likelihood that the company will collect the revenue-sharing income during the term of the agreement; the ability of the company to replace the services provided by the entity providing the revenue-sharing income; and the ability of the entity providing the revenue-sharing income to replace the service provided by the company.
 - b. Amounts Included – The amount of revenue-sharing income and a description of the rationale for the amount of revenue-sharing income included in the projections, including any reduction for expenses.
 - c. Revenue-Sharing Margins – The level of margin in the prudent estimate assumptions for revenue-sharing income and a description of the rationale for the margin for uncertainty. Also, a demonstration that the amounts of net revenue-sharing income, after reflecting margins, do not exceed the limits set forth in VM-21 Section 4.A.5.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 future hedging strategies supporting the contracts, 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 addressing each of the CDHS documentation attributes for any future hedging strategies supporting the contracts.
 - c. 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.

- d. 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 future hedging strategy supporting the contracts, confirmation that currently held hedge assets were included in the starting assets.
 - 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. Discussion of the projection horizon for the future hedging strategy as modeled and a comparison to the timeline for any anticipated future changes in the company's hedging strategy.
 - v. 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.
 - vi. Any discontinuous hedging strategies modeled, and where such discontinuous hedging strategies contribute materially to a reduction in the SR, 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.
 - vii. 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).
 - viii. 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 SR.
 - ix. Any model adjustments made when calculating CTE 70 (adjusted), in particular, any liquidation or substitution of assets for currently held hedges. If there is liquidation or a substitution of assets for currently held hedges, disclosure of the impact on the adjusted run.
 - x. Justification for the margin for any future hedging strategy that offsets interest index credits associated with index crediting strategies (index credits), including relevant experience, other relevant analysis, and an assessment of potential model error.
 - xi. Ten years of historical experience on hedge gains/losses as a percent of index credited for hedge programs supporting index credits.
 - xii. If there is less than five years of historical experience of this hedging program or a hedging program on similar products, an explanation of how the company considered increases in the error factor to account for limited

historical experience.

- 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 that is chosen based on the guidance provided in VM-21 Section 9.C.7, considering the actual history available, mock testing performed, and the degree and nature of any changes made to the hedge strategy.
 - vi. The basis for the magnitude of adjustment or lack of adjustment for the value of E chosen based on the robustness of the documentation outlining the future hedging strategy.
 - f. Safe Harbor for Future Hedging Strategies – If electing the safe harbor approach for a future hedging strategy supporting the contracts, 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.
9. Scenario Generation – The following information regarding the scenario generation for interest

rates and equity returns used by the company in performing a principle-based valuation under VM-21 and in determining the C-3 RBC amount under LR027, as it applies to the calculation of the SR, TAR and CTEPA (if used):

- a. Sources – Identification of the sources or generators used to produce the scenarios. Versions should be identified and parameters to the scenario generation shall be available upon request.
- b. Number of Scenarios – Number of scenarios used, rationale for that number, methods used to determine the sampling error of the CTE 70 and CTE 98 statistic when using the selected number of scenarios, and documentation that any resulting understatement in reserve or TAR, as compared with that resulting from running additional scenarios, is not material, as discussed in VM-21 Section 4.F.1.
- c. Scenario Reduction Techniques – If a scenario reduction technique is used, a description of the technique and documentation of how the company determined that the technique does not lead to a material understatement of results.
- d. Time-Step – Identification of the time-step of the model (e.g., monthly, quarterly, annual), and results of testing performed to determine that use of a more frequent time-step does not materially increase reserves, as discussed in VM-21 Section 4.F.1.
- e. Proxy Construction – Description of the proxy construction process that establishes a firm relationship between the investment return on the proxy and the grouped separate account funds or equity investments in the general account, as discussed in VM-21 Section 4.A.2.
- f. Mapping Stochastic Economic Paths to Fund Performance – Description of method to translate stochastic economic paths into fund performance.
- g. Proxy Funds Not Within Scope of Prescribed Scenario Generator – For any proxy fund returns generated by a non-prescribed scenario generator (e.g., volatility control funds and any funds projected dynamically in the liability model), a description of:
 - i. The market price of risk implied in the projected fund returns.
 - ii. A correlation matrix that illustrates the average correlations across all scenarios and all time periods of the projected fund returns with the fund returns generated by the prescribed generator.
 - iii. Any other information that provides assurance that the returns for proxy funds generated using a non-prescribed scenario generator do not consistently outperform over the long term if the company believes that the market price of risk and correlations described above are misleading or not relevant.
- h. Implied Volatility – Whether using the prescribed scenario generator or a non-prescribed scenario generator, a description of the implied volatility including:
 - i. Discussion of the modeling process used to generate implied volatility surfaces and how they meet the requirements defined in VM-21 Section 8.D.

- ii. Documentation that the implied volatility scenarios generated do not result in a lower TAR than that obtained by assuming that the implied volatility – at all ITM levels – at a given time step in a given scenario is equal to the realized volatility of the underlying asset scenario over the same time period as required by VM-21, Section 8.D.3.
- i. Non-Prescribed Scenario Generator – If using non-prescribed scenario generators in lieu of the prescribed generator, either in part or in full, a summary including:
 - i. Description of the models used for interest rates, fixed income returns, equity returns, and/or volatility and discussion of model calibration.

Guidance Note: Examples of models include, but are not limited to: (1) Vasicek, Hull-White, Cox-Ingersoll-Ross for interest rate models; (2) Merton, reduced-form, ratings-based for fixed income models; or (3) Black-Scholes, Heston, Bates for equity and/or volatility models. Model calibration refers to the process of reflecting the company's view of future market dynamics into their risk-modeling environment.

- ii. If vendor software is used, identification of vendor, software name, and version number.
 - iii. Identification of whether the scenario generators were developed for VM-21 purposes, or adopted from another purpose such as pricing or asset adequacy testing. If the latter, discussion of any adjustments made for VM-21 purposes, and rationale for the adjustments.
 - iv. A statement that the interest rate, equity, and implied volatility scenarios used to determine reserves are available upon request in an electronic spreadsheet format to facilitate any regulatory review.
 - v. Documentation that scenarios generated do not result in a TAR that is materially lower than the TAR resulting from scenarios generated from the prescribed generator.
 - vi. Discussion of any correlation that exists in the development of interest rate and equity scenarios.
10. Reinsurance – The following information regarding the reinsurance assumptions used by the company in performing a principle-based valuation under VM-21:
- a. Agreements – For those reinsurance agreements included in the calculation of the aggregate reserve as per VM-21 Section 5, a description of each reinsurance agreement, including, but not limited to, the type of agreement, the counterparty, the risks reinsured, the portion of business reinsured, and whether the agreement complies with the requirements of the credit for reinsurance under the terms of the AP&P Manual. Include identification of both affiliated and non-affiliated, as well as captive and non-captive, relationships.
 - b. Assumptions – Description of reinsurance assumptions used to determine the cash flows included in the model.
 - c. Modeling – Description of how post-reinsurance-ceded reserves are modeled.
 - d. Separate Stochastic Analysis – Description of any separate stochastic analysis that was used outside the cash-flow model to quantify the impact on reinsurance cash

flows to and from the company, include which variables are modeled stochastically.

- e. Multiple Agreements – If contracts are covered by more than one reinsurance agreement, a description of how reinsurance cash flows from the multiple agreements interact and are reflected in the cash-flow model.
 - f. Pre-Reinsurance-Ceded Aggregate Reserve – Description and rationale for methods and assumptions (including liability assumptions, asset assumptions, and starting asset amounts) used in determining the pre-reinsurance-ceded aggregate reserve if they differ from methods and assumptions used in determining the aggregate reserve post-reinsurance-ceded.
11. Alternative Methodology – The following information regarding the alternative methodology used by the company:
- a. Grouping – Statement that a seriatim approach was used, or a description of how contracts were grouped, if a seriatim approach was not used.
 - b. Assumptions – For contracts with GMDBs, disclosure of assumptions in the alternative methodology using published factors, including:
 - i. For component CA, the mapping to prescribed asset categories, lapse rates and withdrawal rates.
 - ii. For component FE, the determination of fixed dollar costs and revenues, lapse rates, withdrawal rates, and inflation rates.
 - iii. For component GC:
 - a) Description of contract features and disclosure of mapping contract-level attributes to alternative methodology factors, including product definition, partial withdrawal provision, fund class, attained age, contract duration, ratio of account value to guaranteed value, and annualized account charge differential from base assumption.
 - b) Derivation of equivalent account charges and margin offset.
 - c) Disclosure of interpolation procedures and confirmation of node determination.
 - c. Reinsurance – For contracts with GMDBs, disclosure, if applicable, of reinsurance that exists and how it was handled in applying published factors (for some reinsurance, creation of company-specific factors or stochastic modeling may be required) and discussion of how reserves before reinsurance were determined.
 - d. Company-Specific Factors – For contracts with GMDBs, if company-specific factors are used, documentation of the stochastic analysis supporting adjustments to the published factors. Adjustments may include contract design, risk mitigation strategy (excluding hedging), or reinsurance.
 - e. Impact of Floors – For contracts with GMDBs, discussion of whether the alternative methodology reserve was impacted by the floors described in VM-21 Section 7.A.1, and disclosure of the alternative methodology reserve without

regard to any floor, the cash surrender value, and the reserve under AG 33 in VM-C.

12. Additional Standard Projection Amount – The following information regarding the calculations to determine the additional standard projection amount performed by the company:
- a. Method – Disclosure of the method used for the additional standard scenario projection amount, either the CSMP method or the CTEPA.
 - b. CSMP – If using the CSMP method, a summary including:
 - i. Disclosure (in tabular form) of all scenario reserves in the Company Standard Projection Set and the scenario reserves from Market Paths A and B from the Prescribed Standard Projection Set, as described in VM-21 Section 6.B.2. If available, include disclosure of all scenario reserves from the Prescribed Standard Projection Set.
 - ii. Summary of results from a cumulative decrement projection along Path A (where Path A is described in VM-21 Section 6.B.2.a), 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 Company Amount A.
 - iv. The data sources used to obtain the implied volatility term structure and spot exchange rates in effect as of the valuation date in the prescribed market paths defined in VM-21 Section 6.B.5.
 - 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 SR following VM-21 Section 4.A.4.a for a company that does not have a future hedging strategy supporting the contracts), 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 SR following VM-21 Section 4.A.4.a for a company that does not have a future hedging strategy supporting the contracts), 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 SR.
 - d. Model Comparison – Discussion of any differences between the cash-flow models used to determine the additional standard projection amount and those used to determine the SR, including any differences in the model validations performed and how the models were evaluated for appropriateness and applicability.
 - e. Benefits Not Described – Regarding the assumptions in VM-21 Section 6.C, discussion of any benefit type proxy chosen, or other approximations applied for benefit types not described in the aforementioned section, and the rationale for the chosen proxy or approximations.
 - f. Data Limitations – Regarding the partial withdrawal assumption in VM-21 Section 6.C.4, discussion of any proxy method used due to data limitations (e.g., with respect to policies that are not enrolled in an automatic withdrawal program but have exercised a non-excess withdrawal in the contract year immediately preceding the valuation date), with documentation that supports the conclusion that the proxy method does not result in a material understatement of the reserve.
 - g. Discarding Withdrawal Ages – Regarding the withdrawal delay cohort method in VM-21 Section 6.C.5, disclosure of whether certain withdrawal ages were discarded, or others used as representative as described in VM-21 Section 6.C.5.k, including discussion of the appropriateness of the chosen method.
 - h. Modifications – Discussion of any modifications in the application of the requirements to produce the additional standard projection amount.
 - i. Assumptions Not Prescribed – Discussion of any assumptions with judgments or procedures used to produce the additional standard projection amount that are not prescribed and not the same as used in the calculation of SR.
 - j. Reinsurance – Description of any reinsurance treaties that have been excluded from the calculation of the additional standard projection amount along with an explanation of why the treaty was excluded, as well as a confirmation that none of the reinsurance treaties included serve solely to reduce the calculated additional standard projection amount without also reducing risk on scenarios similar to those used to determine the SR.
 - k. Other Considerations – To the extent not discussed elsewhere in the VA Report, a description of any material assumptions, margins, and other considerations helpful in or necessary to understanding the rationale behind the development of assumptions and margins used in the calculation of the additional standard projection amount, as well as disclosure of any analysis that has been performed to highlight the major drivers of the result.
 - l. Impact of Aggregation – Disclosure of the impact of aggregation, and discussion of the method used to determine the impact, pursuant to VM-21 Section 6.A.1.a.
13. Additional Information – The following additional information:
- a. Per-Contract Amounts – Description of the basis for the allocation to per-contract amounts, in accordance with VM-21 Section 12.

- b. Phase-In – If electing a phase-in period, as described in VM-21 Section 2.B, discussion of the phase-in calculation including:
- i. Regarding the determination of R2—i.e., the reserve as of Jan. 1, 2020, following the VM-21 requirements in the 2019 NAIC *Valuation Manual*—disclosure of all changes from the Dec. 31, 2019, reserve reported and documented in the 2019 PBR Actuarial Report (or AG 43 actuarial memorandum). Such changes should include changes in reinsurance agreements (e.g., recaptures) and other significant changes in in-force policies.
 - ii. Regarding the determination of R1—i.e., the reserve as of the valuation date following the VM-21 requirements on or after Jan. 1, 2020—disclosure of deviations from R2 in areas such as in-force contracts, scenario generation, or other aspects that should parallel the R2 calculation. Also include disclosure of deviations from the methods and factors used for 2020 reserve and documented in the 2020 VA Summary and VA Report for those areas that should parallel those used for the Dec. 31, 2020, reserves.
 - iii. Disclosure of any scaling factors applied to the phase-in amount due to material changes in the book of business, as well as any other modifications of the remaining phase-in amount.
- c. Sensitivity Tests – For each distinct product type for which margins were established:
- i. List the specific sensitivity tests performed for each risk factor or combination of risk factors, other than those discussed in Section 3.F.3.h.vi and Section 3.F.3.i.ii.
 - ii. Indicate whether the reserve was calculated based on the anticipated experience assumptions or prudent estimate assumptions for all other risk factors while performing the tests.
 - iii. Provide the numerical results of the sensitivity tests for both reserves and capital.
 - iv. Explain how the results of sensitivity tests were used or considered in developing assumptions.
- d. Impact of Margin
- i. Company can perform the impact of margin analysis using off-cycle data. The analysis can be done less frequently than annually unless there is change or update in the margins, but not less frequently than every three years.
 - ii. Impact of Margins for Each Risk Factor – The impact of margins on the SR for each risk factor, or group of risk factors, that has a material impact on the SR, determined by subtracting (i) from (ii), expressed in both dollar amounts and percentages. For the purposes of this analysis, calculate the CTE without requiring that the scenario reserve for any scenario be no less than the cash surrender value:

1. The CTE70 (best efforts), as outlined in VM-21, Section 9.C, but with the

reserve calculated based on the anticipated experience assumption for the risk factor and prudent estimate assumptions for all other risk factors.

2. The CTE70 (best efforts), as outlined in VM-21, Section 9.C, for that group of contracts as reported.
 3. Repeat the impact analysis using the same method on CTE98 levels.
- iii. Aggregate Impact of Margins – The aggregate impact of all margins on the SR for that group of contracts determined by subtracting (1) from (2), expressed in both dollar amounts and percentages. For the purposes of this analysis, calculate the CTE without requiring that the scenario reserve for any scenario be no less than the cash surrender value:
1. The CTE70 (best efforts), as outlined in VM-21, Section 9.C, for that group of contracts, but with the reserve calculated based on anticipated experience assumptions for all risk factors prior to the addition of any margins.
 2. The CTE70 (best efforts), as outlined in VM-21, Section 9.C, for that group of contracts as reported.
 3. Repeat the impact analysis using the same method on CTE98 levels.
- iv. Impact of Implicit Margins – For the purposes of the disclosures required in Section 13.d.ii and Section 13.d.iii above:
1. If the company believes the method used to determine anticipated experience 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.
 2. Since the company is not required to determine an anticipated experience assumption or a prudent estimate assumption for risk factors that are prescribed (i.e., interest rates movements, equity performance, default costs, and net spreads on reinvestment assets), when determining the impact of margins, the prescribed assumption shall be deemed to be the prudent estimate assumption for the risk factor, and the company can elect to determine an anticipated experience assumption for the risk factor, based on the company's anticipated experience for the risk factor. If this is elected, the company shall document the rationale and method used to determine the anticipated experience assumption.
- e. Calculations as of a Date Preceding the Valuation Date – If the SR and/or the additional standard projection amount were developed as of a date prior to the valuation date, disclosure of the prior date, the SR and the additional standard projection amount of the in force on the prior date, and an explanation of why the use of such a date will not produce a material change in the results compared to if the results were based on the valuation date. Such an explanation shall describe the process that the qualified actuary used to determine the adjustment required by VM-21 Section 3.I, the amount of the adjustment, and the rationale for why the adjustment is appropriate.

14. RBC – If electing to include documentation of the RBC calculation in the PBR Actuarial Report, the following information regarding the risk-based capital, as described in the Life RBC instructions LR027:
 - a. Documentation and discussion of assumptions or methods that differ from those used for the reserve calculations.
 - b. Description of the results of the modeling and analysis, including a table displaying each of the seven steps of the RBC calculation.
 - c. Description of the process to split the resulting RBC into interest and market components, and the results of that split.
 - d. If the alternative methodology was used, documentation of any non-prescribed factors and the basis for those factors.
 - e. State the method that the company used to recognize the impact of federal income tax. If the company used the specific tax recognition, disclosure of the result of the macro tax adjustment method.
15. Reliance Descriptions and Statements – A description of those areas where the qualified actuary relied on others for data, assumptions, projections or analysis in performing the principle-based valuation under VM-21 and a reliance statement from each individual on whom the qualified actuary relied that includes:
 - a. Reliance Listing – The name, title, telephone number, e-mail address and qualifications of the individual, along with the individual’s company name and address, and the information provided.
 - b. Reliance Statements – A statement as to the accuracy, completeness or reasonableness, as applicable, of the information provided, along with a signature and the date signed.
16. Certifications – The following certifications:
 - a. Investment Officer on Investments – A certification from a duly authorized investment officer that the modeled asset investment strategy, including any future hedging strategies supporting the contracts, 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 that documentation of the CDHS attributes for any future hedging strategies supporting the contracts are accurate.
 - 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 future hedging strategies supporting the contracts is consistent with the company’s actual future hedging strategies and was performed in accordance with VM-21 and in compliance with all applicable ASOPs.
 - c. Senior Management on Internal Controls – A certification from senior management, other than the qualified actuary, regarding the effectiveness of

internal controls with respect to the principle-based valuation under VM-21, as provided in Section 12B(2) of Model #820.

- d. Qualified Actuary on Accordance with VM-21 and Model #820 – Certification by the qualified actuary, for the groups of contracts for which responsibility was assigned, that the principle-based valuation was performed in accordance with the principles and requirements outlined in VM-21 and the relevant sections of Model #820.
 - e. Qualified Actuary on Assumptions and Margins – Certification by the qualified actuary, for the groups of contracts for which responsibility was assigned, that the assumptions used in the principle-based valuation under VM-21 are prudent estimate assumptions for the products, scenarios, and purpose being tested.
17. Closing Paragraph – A closing paragraph with the signature, credentials, title, telephone number and e-mail address of the qualified actuary, the company name and address, and the date signed.

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