

July 31st, 2024

**Annuity Reserves and Capital Subcommittee
American Academy of Actuaries
Reserves & Capital Field Testing
Description & Specifications**

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Section I: Field Study Overview

Objectives

- 1) Measure the impact on actual business of the proposed reserve and capital frameworks relative to the current standards to ensure frameworks are working as intended.
 - Conduct field test to inform decisions related to the proposed non-variable annuity principle-based reserving (PBR) methodology:
 - Test exclusion testing, allocation, proposed treatment for hedging indexed credit, aggregation, and other methodology elements.
 - Whenever this document references the PBR methodology, it means the framework documented in the most recent exposure draft: VM-22 Draft – July 2023.
 - Whenever this document references the SPA, it means the most recent exposure draft: VM-22 SPA – June 2024 Clean.
- 2) At a high-level, ensure pillars of framework are met:
 - Appropriate Reflection of Risk—All else equal, greater risk in **adverse conditions** requires greater statutory reserves/capital, and vice-versa.
 - Comprehensive—The statutory reserve accounts for all **material risks covered in the Valuation Manual and inherent in product features and potential management actions** associated with the policies or contracts being valued.
 - Consistency Across Products—Statutory reserves between two contracts with **similar features and risks are consistent** given the same anticipated experience, regardless of product type.
 - Practicality and Appropriateness—**Balance principles above with an approach that is practical**, auditable, and able to be implemented.
- 3) Test the impact of key open VM-22 design decisions:
 - Aggregation
 - Reinvestment guardrails
 - Exclusion test
 - Standard Projection Amount assumptions

Timeline: August – September 2024, and to extend, if appropriate, until completion

Structure

- A coordinated effort between the American Academy of Actuaries (Academy), the National Association of Insurance Commissioners (NAIC), and the American Council of Life Insurers (ACLI)
- Ernst & Young LLP (EY) has been hired to support the field test and will:

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- Provide feedback on the field test specifications.
- Provide modeling support to participating companies on weekly calls, and individually as needed.
- Work with NAIC to ensure appropriate anonymity and with Academy Research staff to help aggregate and summarize results; and
- Supplement the analysis of the field test results with sensitivities performed in a Model Office as needed.

Products Covered (companies can choose which of their products to field test)

Results will only be reported publicly if at least five participating companies participate in each product group to ensure anonymity.

- Deferred Non-Variable Annuities
 - Fixed Indexed Annuities (FIAs) with Guaranteed Living Benefits (GLBs)
 - FIAs without GLBs
 - Fixed Deferred Annuities (FDAs) with GLBs
 - FDAs without GLBs
- Payout Annuities
(Including non-life contingent)
 - Single Premium Immediate Annuities (SPIAs)
 - Pension Risk Transfer (PRT)
 - Deferred Income Annuities (DIAs)
 - Structured Settlement Contracts (SSCs)

Population

- For time = 0, test at least 10 years of inforce, where possible, for all non-variable annuity products included in your testing scope
 - Participants must provide output by policy duration or issue year.
 - i. For these runs, assign assets reasonably to issue year/policy duration cohorts and perform distinct runs.
 - ii. If the above is not possible, then allocation methods permissible under VM-22 may be used.
 - iii. Please disclose which of (i) or (ii) was chosen and then, if applicable, the allocation method.
 - iv. Please specify how many years of inforce were included.
 - At option of the participant, may test using all past inforce business.
 - If less than 10 years of inforce is available for certain products, provide as many years as possible.

Time Zero Valuation Date

- 12/31/2023

Model Type

- A model office in GGY Axis will be built by E&Y, and E&Y will host periodic modeling calls.
- Use a model that can project future cash flows over the contract life for the modeled block.
 - Can be based on valuation model, planning/forecasting model, or pricing model.
- Encourage use of a model that can re-project reserves at future time periods.
 - See Section V in this document for additional requirements on projecting future reserves.
 - If unable to project, please indicate in responses and leave Projections section empty.

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Section II: Assumption Specifications

Asset Assumptions

- Use asset assumptions found in VM-22 draft instructions.
- Participants shall disclose their starting asset portfolio and reinvestment assets used.
- Participants should disclose methodology for asset allocation when providing results.
- Investment guardrails for fixed income investment strategy set to:
 - 50% AA, 50% A for baseline run.
- Index-based hedging programs shall use company assumptions, if possible, with the level disclosed. If not possible, for any reason, set index-based hedging program error to 1.5%.
 - Set all other hedging program error factors to 5%
 - Please share the reason it is not possible to use a company assumption if the field test default of 1.5% is assumed.
- Include margins on company experience assumptions (see subsection below).

Liability Assumption & Margin Requirements

- Prudent estimate assumptions for the VM-22 deterministic and stochastic reserve.
 - Set, and disclose with results, margins on mortality, policyholder behavior, expenses, hedging, non-guaranteed elements (NGEs), withdrawals, and other assumptions as deemed necessary.
 - If a company does not wish to use its own margins, then use the field test default margins below:
 - +/-10% mortality on plus/minus segments, +5% maintenance expenses, +/- 10% on lapses, 150% dynamic lapses (capped at 100% lapse), 5% shift from no withdrawals to 10-year GLB withdrawals. Each margin in isolation must increase the reserve.
 - The field test will focus on pre-reinsurance ceded reserves.

Economic Scenario Information:

- GOES Field Test Scenario Set #1 will be used.
- A specific subset of 200 scenarios will be provided.
- Participants are encouraged to compare results under 1000 scenarios versus 200 scenarios but are not required to do so.

Metrics/Output

- Provide following metrics at time zero and by scenario where relevant (see template):
 - Scenario level reserves
 - Deterministic reserve as applicable
 - Commissioners' Annuity Reserve Valuation Method (CARVM)
- "Proposed VM-22" measures relative to,
- "Current CARVM" methods such as Actuarial Guideline (AG)33, AG35, etc.

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- Note that wherever “CARVM” is used in this document, it is meant to mean “Current CARVM.”
- C3P1 capital amount
- Additional Standard Projection Amount
- Exclusion test results

Aggregation

- To give context to baseline runs, provide details of any aggregation assumed as permitted in current VM-22 framework draft. Specifically, also provide a mapping to the 3 reserving categories (Payout, Longevity Reinsurance, and Accumulation) as applicable.
- As separate sensitivity test runs, provide results by aggregating deferred annuity liabilities in the following two buckets, if possible:
 1. Deferred annuities with GLBs (FIAs or FDAs)
 2. Deferred annuities without GLBs (FIAs or FDAs)
- To give context to baseline runs, share details of all aggregations assumed and model segments tested as permitted. Specifically, also provide a mapping to the three reserving categories (Payout, Longevity Reinsurance, and Accumulation) as applicable. If unable to supply results in this manner, please provide a detailed explanation about why.

Section III: Supplemental Testing

Exclusion test exercise

- Time points tested: Year 0 (required) and year 10 (optional).
- For time = 0, test at least 10 years of inforce for all non-variable annuity products included in your testing scope.
- For time = 10, test the same population used for projected results described in section IV below.
- Scenarios Tested: 16 VM-20 economic scenarios for each mortality scenario specified below as of 12/31/2023.
- Mortality Scenarios: +/- 0%, 5%.
- Exclusion Testing Aggregation: For only the exclusion test, test each of the following subcategories separately and provide mapping for how products would be aggregated in current VM-22 framework draft:
 - Deferred Annuities
 - a. FIAs with GLBs
 - b. FIAs without GLBs
 - c. FDAs with GLBs
 - d. FDAs without GLBs
 - Payout Annuities
 - e. Individual and joint life-contingent (LC) SPIA/DIAs
 - f. Individual non-life-contingent (NLC) SPIA/DIAs
 - g. Pension risk transfer contracts (reported at the tested level of aggregation, for example it may be appropriate to separate deferred benefits)

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- h. Optional to test structured settlements separately or combine into above sections (and split L]/NLC as for SPIA/DIAs)
 - Longevity reinsurance
 - All other
- i. Please provide brief description of product for other in-scope products not specified above for which results are provided and which grouping they were tested in.

Indicate whether or not a hedging program exists for each block, and if so, provide responses to the hedging survey questions below for each block.

Supplemental Testing Questions

I. Hedging

- a. Identify the type of hedging you do for products in VM-22 scope. For example,
 - i. hedge only index credits for index products.
 - 1. For index credit hedging, are the hedges static, dynamic, or a blend of the two?
 - ii. hedge GLBs and/or other guaranteed benefits.
 - iii. other hedging (e.g., asset-liability matching (ALM) interest rate risk hedging).
 - iv. type of hedging strategic objective or target (GAAP/Stat/Economic).
 - v. use of capital preservation hedges (i.e., macro hedges).
- b. Do you have any concerns with following the VM-21 hedging approach for VM-22?
 - i. Do you plan to reflect hedges implicitly or explicitly under VM-22, and if applicable, what is your current approach for VM-21?

II. Allocation

- a. Confirm whether you are able to apply the allocation methodology as described in VM-22 for all products in scope.
- b. Identify any concerns with this allocation methodology (as described in section 13).

Additional Standard Projection Amount (SPA)

Test the SPA as described in the latest exposure draft including the latest assumptions (which may be revised as needed during the exposure period):

- Follow same aggregation approach as above.
- Produce measures for the Additional Standard Projection Amount at the same level of detail as requested for the SR above (see template).

Section IV: Projections

Projection Metrics and Future Valuation Nodes

- Project following metrics at projection years 10 and 20:
 - Account value and cash surrender value
 - “Proposed VM-22” and “Current CARVM” measures under AG33, AG35, etc.
 - CTE70, CTE90, CTE95, CTE98, Median (use same liability assumptions as before)

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- For value at risk (VaR)/CTE runs, if available, provide:
 - Actuarial present value of benefits, expenses, and related amounts less the actuarial present value of premiums and related amounts plus the balance of any separate account assets at each valuation time node.
 - Present values are calculated using the discount factors implied by the NAER vector under the path of discount rates specified by the economic scenario.

Population

- o For projections, either create a population using inforce population based on the most recent issue year or use a pricing population (pricing cells) for a single year of issue business based on recent historical inforce business.

Outer Loop Scenario Requirements

- The outer loop requirements should be based on unmarginated PBR experience assumptions unless specified below.
- Use scenario 9, from the Exclusion Test Scenarios, for interest rates and equities from scenario generator for outer loop assumptions:
 - o Interest rate and equity scenario assumptions will be provided to field testing participants.
 - o Three sets of 200 scenarios, 600 in total (if including time 0, time 10, time 20), will be provided for field testing participants at each valuation point.
 - o Assume 0.5% mortality improvement from the valuation date and 2% expense inflation applicable to per policy expenses.
 - o Assume the company's inforce portfolio mix and reinvestment strategy (ignoring any VM guardrails).
 - o Use VM prescribed long-term spreads and defaults.

Section V: Sensitivities

- Remove each assumption margin (mortality, lapse, withdrawal, expense and other) and provide results (summary at minimum, but all detail including capital is preferred).
 - o For each sensitivity run, provide responses in a new version of the template (and at the same level of detail whenever possible).
 - o For t=0 scenarios, remove one at a time. For projection runs, remove all at once.
 - o Capital calculations continue to follow the instructions in the attached for sensitivities.
- Test alternative investment guardrails at the aggregation group level:
 - o 5% Treasury, 15% AA, 40% A, 40% BBB for required sensitivity run.
 - o 5% Treasury, 15% AA, 80% A as an additional optional sensitivity.
- Runtime permitting, companies may choose to test the DR methodology under the VM-20 method.

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Appendix VM-22 Field Test Template Definitions

Unless otherwise specified, the section references below are from Valuation Manual VM-22.

Reserves – Summary

Commissioners Annuity Reserve Valuation Method (CARVM) Reserve = the current minimum reserve valuation standard for non-variable annuities as determined by CARVM

CSV = Cash Surrender Value means the amount available to the contract holder upon surrender of the contract. Generally, it is equal to the account value less any applicable surrender charges, where the surrender charge reflects the availability of any free partial surrender options. However, for contracts where all or a portion of the amount available to the contract holder upon surrender is subject to a market value adjustment, the cash surrender value shall reflect the market value adjustment consistent with the required treatment of the underlying assets. That is, the cash surrender value shall reflect any market value adjustments where the underlying assets are reported at market value, but it shall not reflect any market value adjustments where the underlying assets are reported at book value.

Proposed VM-22 Reserve (VM-22) = The upcoming minimum reserve valuation standard for non-variable annuity contracts as defined by the Valuation Manual (VM-22). It is equal to the aggregate reserve as defined in Section 3.A. The aggregate reserve for contracts falling within the scope of these requirements shall equal the SR (following the requirements of Section 4) plus the additional standard projection amount (following the requirements of Section 6) plus the DR for those contracts satisfying the Deterministic Certification Option, less any applicable PIMR for all contracts not valued under applicable requirements in VM-A and VM-C, plus the reserve for any contracts valued under applicable requirements in VM-A, VM-C, and VM-V.

Reserves—Detail Segment

FIA = Fixed Indexed Annuity as defined in Section 1.D. An annuity with an account value where the contract holder has the option for a portion or all of the account value to grow at a rate linked to an external index, typically with guaranteed principal.

FA = Fixed Annuity: Flexible Premium Deferred Annuity (FPDA), Multiple Year Guaranteed Annuity (MYGA) and Single Premium Deferred Annuity (SPDA), all as defined in Section 1.D.

FPDA = An annuity with an account value established with a premium amount but allows for additional deposits to be paid into the annuity over time, resulting in an increase to the account value. The contract also has a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase.

MYGA = A type of fixed annuity that provides a pre-determined and contractually guaranteed interest rate for specified periods of time, after which there is typically an annual reset or renewal of a multiple-year guarantee period.

SPDA = An annuity with an account value established with a single premium amount that grows with a guaranteed interest rate during the accumulation phase and has guaranteed mortality and interest rates applicable at the time of conversion to the payout phase. May also include cases where the premium is accepted for a limited amount of time early in the contract life, such as only in the first duration.

SPIA = Single Premium Immediate Annuity as defined in Section 1.D. An annuity purchased with a single premium amount which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin within one year after (or from) the issue date.

PRT = Pension Risk Transfer Annuity as defined in Section 1.D. An annuity, typically a group contract or reinsurance agreement, issued by an insurance company providing periodic payments to annuitants receiving immediate or deferred benefits from one or more retirement plans. Typically, the insurance company holds the assets supporting the benefits, which may be held in the general or separate account and retains not only longevity risk but also asset risks (e.g., credit risk and reinvestment risk).

DIA = Deferred Income Annuity as defined in Section 1.D. An annuity which guarantees a periodic payment for the life of the annuitant or a term certain and payments begin one year or later after (or from) the issue date if the contract holder survives to a predetermined future age.

SSC = Structured Settlement Contract as defined in Section 1.D. A contract that provides periodic benefits and is purchased with a single premium amount stemming from various types of claims pertaining to court settlements or out-of-court settlements from tort actions arising from accidents, medical malpractice, and other causes. Adverse mortality is typically expected for these contracts.

Type

Base (Non-GLB) = contracts without guaranteed living benefits

GLB – All = GLB – SL + GLB – JL = contracts with guaranteed living benefits, both single and joint life

GLB – SL = contracts with guaranteed living benefits that do not have a joint life option

GLB – JL = contracts with guaranteed living benefits that have a joint life option

Add additional categories for material benefits.

For each Segment/Type category, the calculations below should be performed only across the policies in that specific category and shall not reflect any other benefits of aggregation.

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Total Account Value = represents the current value of the contract, and it includes both the fixed account value, and any index account values, as applicable. It is generally equal to the premium paid net of any premium taxes minus any gross withdrawals, plus any earned interest credited by the fixed account and any index accounts. It is the contract value prior to application of surrender charges or market value adjustment. For GLB riders, this will be the Account Value of the base contract. For SPIAs, or other products that offer no surrender benefits, no value is expected.

Fixed Account = an option under the contract funded by the general account of the company offering guaranteed interest rates. Not an explicit field.

Index Account = an option under the contract funded by the general account of the company offering crediting of earnings at specified times based upon the performance of an index. Not an explicit field.

Fixed Account Value = the account value of the fixed account.

Cash Surrender Value – see Reserves Summary above.

Market Value Adjustment (MVA) = an adjustment paid at the time of a withdrawal or surrender based on, typically, interest rates or index returns. It can be positive (increasing the value of a withdrawal/surrender) or negative.

Policies In Force = the total number of policies in force as of the valuation date

CARVM Reserve – see Reserves Summary above for definition.

VM-22 Reserve – see Reserves Summary above for definition.

Average Years In Force = the average policy duration at the valuation date across all policies in force within the category as of the valuation date

Average Issue Age = the average issue age across all policies in force within the category as of the valuation date

Average Attained Age = the average attained age as of the valuation date across all policies in force within the category as of the valuation date

% Female = the percent of single policies, female, among all the policies in force as of the valuation date

% JL = the percent of joint-life policies among all the policies in force as of the valuation date

Income Base = the total benefit base as of valuation date for policies with a guaranteed living benefit in force as of valuation date, where

Benefit Base = the amount used to calculate the maximum lifetime income benefit payments for policies with a guaranteed living benefit rider

Average In-The-Money (ITM-ness) = the average ITM-ness as of the valuation date for all policies with a guaranteed living benefit rider in force as of the valuation date, where ITM-ness is defined as either (please note the method used): $\text{Benefit Base}/\text{AV} - 1$ or $\text{PV}(\text{GLWB})/\text{AV} - 1$.

% Contracts Receiving Withdrawals/Payouts = percent of policies with a living benefit rider that took a withdrawal under the rider in the past 12 months.

Weighted Average Withdrawal/Payout Amt = the average income as of the valuation date across all policies with a living benefit rider that are in income phase as of the valuation date, weighted by the benefit base and expressed as an amount.

Weighted Average Credited Rate / Option Budget = the weighted average across all fixed account credited rates and hedge budgets as of the valuation date across all policies in force as of the valuation date using total account value as weight. If a policy has both a fixed account and/or one or more index account, first calculate the Weighted Average Credited Rate/Option Budget for that policy using the fixed account value and/or each index account value as weights, then use this calculated value and the total account value in the weighted average across all policies.

Reserves - Detail Stoch.

CTExx = Conditional Tail Expectation is equal to the numerical average of the (100-xx) percent worst values of a set of values.

CTExx Amount = is the CTExx of the Scenario Reserve across all scenarios following the requirements of Section 4

Median Amount = is the median Scenario Reserve across all scenarios following the requirements of Section 4

CTExx APV Benefits & Expense = for each scenario that comprises the CTExx Amount, the average of each's scenario's greatest present value of benefits and expenses that are part of the CTExx Amount calculation above

CTExx APV Premiums, etc. = average of the present value of premiums that are part of the CTExx Amount calculation above

Asset Balance = starting asset amount

Capital

The following terms are defined in the NAIC Life Risk-Based Capital (RBC) formula instructions under LR027, section Cash Flow Modeling for C-3 RBC Requirements for Variable Annuities and Similar Products:

Macro Tax Adjustment (MTA) = If using the MTA, the modeled cash flows will ignore the effect of Federal Income Tax. As a result, for each individual scenario, the numerical value of the scenario reserve used in this calculation should be identical to that for the same scenario in the Aggregate Reserve calculation under VM-22. Federal Income Tax is reflected later in the formula.

Specific Tax Recognition (STR) = If using STR, CTE After-Tax (98) (CTEAT (98)) may be calculated using an approach in which the effect of Federal Income Tax is reflected in the projection of Accumulated Deficiencies, as defined in Section 4 of VM-22, when calculating the Scenario Reserve for each scenario. To reflect the effect of Federal Income Tax, the company should find a reasonable and consistent basis for approximating the evolution of tax reserves in the projection, taking into account restrictions around the size of the tax reserves (e.g., that tax reserve must equal or exceed the cash surrender value for a given contract). The Accumulated Deficiency at the end of each projection year should also be discounted at

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a rate that reflects the projected after-tax discount rates in that year. In addition, the company should add the Tax Adjustment as described below to the calculated CTEAT (98) value.

Additional Standard Projection Amount (ASPA) = is calculated using the methodology outlined in Section 6 of VM-22.

OLD Factor-Based Calculation (enter after-tax amounts) = Related to Lines 2-32 of the NAIC RBC instructions under LR027.

- For company results, develop an after-tax Line 32 only including the products to be tested for VM-22.
- For individual product results, use the individual lines 2-31, as appropriate (after-tax)

OLD C3P1 (enter after tax amounts) = C-3 RBC Cash Flow Testing Interest Rate Risk as defined in the NAIC RBC instructions under LR027.

- For company results, develop an after-tax Line 33 excluding the products out of scope for VM-22. Please indicate what products are included.
- For individual product results, redo the calculation from line 33 assuming that particular product is the only product subject to C-3 RBC cash flow testing, so there is no aggregation benefit with other products (enter an after-tax amount).