



AMERICAN ACADEMY *of* ACTUARIES

Report of the American Academy of Actuaries' Variable Annuity Reserve Work Group

**Presented to the National Association of Insurance Commissioners'
Life and Health Actuarial Task Force**

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Variable Annuity Reserve Work Group

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American Academy of Actuaries
Variable Annuity Reserve Work Group

I. Background

The Variable Annuity Reserve Work Group (VARWG) was formed in January 2003 as a work group of the American Academy of Actuaries' Life Practice Council (LPC), drawing resources from the Life Capital Adequacy Subcommittee and the Life Valuation Subcommittee. Its charge is to examine issues surrounding the development of a reserve methodology for variable annuity products that uses the principles of the proposed Risk-Based Capital (RBC) C-3 Phase II approach. The VARWG will examine the effectiveness of such a methodology, and identify and comment on regulatory and practicality issues. Where appropriate, the work group will work with NAIC's Life and Health Actuarial Task Force (LHATF) to develop the methodology and make recommendations on strategies to address any issues that have been identified or that may arise.

During the March 2003 NAIC meeting and on a subsequent April conference call, the VARWG presented its initial discussions to LHATF and communicated potential directions for future work group initiatives. On both occasions, the VARWG received comments from LHATF regarding the general nature of these initiatives.

Over the last three months, the VARWG has continued to work towards its charge, incorporating input from work group members, direction from the LPC and comments from other actuaries (including LHATF). The VARWG will continue to develop a reserve methodology for variable annuity products that uses the principles of the proposed Risk-Based Capital (RBC) C-3 Phase II approach. At the same time, the work group will continue to examine ways to address the regulatory and practical issues that have been raised.

This report summarizes the work of the VARWG since the March NAIC meeting. The VARWG would like to continue to receive comments and input from LHATF on the content of this report and the general direction of these initiatives.

II. Update of Key Issues

A. Reserve Methodology Issues

The VARWG is involved in two related efforts pertaining to this issue.

First, the work group is developing a document that defines the reserve methodology. The current draft of this document is shown in Appendix A. Although the document is in its early stages, the work group believes it is and will continue to be a valuable tool. Currently, the work group is using the document to facilitate discussion on whether all the members agree on the details of the reserve methodology. The VARWG hopes that readers of this report will use the document as a means to better understand the methodology and to generate comments and suggestions.

Because of the length and detail of the document in Appendix A, attention should be given to Section II (Scope), Section III B) (Definitions of Reserve Methodology Terminology) and to Section IV (Definition of New Reserve Approach). These three sections total to only about two pages of reading and will provide you with a good understanding of the proposed approach. Sections V and later provide additional specifications dealing with the required projections, scenarios to be tested, and other details.

Second, the work group is continuing the process of identifying and addressing key methodology issues. The March 2003 report included a list of preliminary methodology issues. Since that report was submitted, the VARWG has reviewed these issues, has added several more issues, and has begun the process of recommending potential solutions. Appendix B of this report updates the list of issues presented in the March 2003 report and includes both tentative recommendations and items to be resolved for these issues.

In addition, the work group is incorporating the issues raised in Appendix B into the document contained in Appendix A. This will allow us to better understand the impact of potential solutions to these issues. Going forward, the document in Appendix A could be used as a framework for either a regulatory requirement (e.g., an actuarial guideline) or a life practice note.

B. Potential Regulatory Form of the Requirement (Law, Regulation or Guideline)

In the March 2003 report, the VARWG presented a preliminary analysis of the advantages and disadvantages of the regulatory form a new reserve methodology could take. Based on feedback from LHATF and others, the work group is expanding this analysis and will take a more comprehensive look at this issue. We expect to present the status of this analysis at the September NAIC meeting.

C. Tax Reserve Issues

The VARWG is continuing to study issues related to compliance with existing tax code requirements for deductibility of reserves. Where it is appropriate, the work group will reflect the results of this research in any recommendations we make.

III. Next Steps

The following are the areas on which the VARWG expects to focus going forward:

- A. Continue to refine the document describing the methodology.
- B. Continue to address the methodology issues, make any necessary recommendations, and incorporate the resolution of these issues into the methodology document.
- C. Continue to work with LHATF to address issues concerning the form of the requirement (e.g., law, regulation or guideline).
- D. Continue to explore the potential impact of the methodology on tax issues.
- E. Begin modeling of reserves once resources become available.
- F. When and where appropriate, identify the need for professional and practical guidance and begin the process to help develop the guidance.

The VARWG plans to update LHATF on its progress at the September NAIC meeting.

Appendix A

CARVM for Variable Annuities Redefined

June 2003 Report

I) Background

II) Scope

- A) This document prescribes minimum reserve requirements for all benefits provided by variable annuity contracts subject to the Commissioner's Annuity Reserve Valuation Method (CARVM), other than contracts sold as fixed annuities, whether or not such contracts contain minimum guaranteed death benefits, enhanced death benefits based on the gain in the contract, or guaranteed living benefits.¹

III) Definitions²

A) Definitions of Benefit Guarantees

- 1) Minimum Guaranteed Death Benefit is the portion of any death benefit payable in excess of the contract account value other than an Enhanced Death Benefit.
- 2) Enhanced Death Benefit is a death benefit payable in excess of the contract account value that is equal to a fraction of the excess of the account value over the net of premiums paid less partial withdrawals made.
- 3) Variable Annuity Guaranteed Living Benefit (VAGLB) is a guaranteed benefit included in a variable deferred or immediate annuity contract providing that:
 - a. One or more guaranteed benefit amounts payable to a living contractholder or living annuitant, under contractually specified conditions (e.g., upon annuitization), if any, will be enhanced should the projected contract value, as defined in section IX), fall

¹ Drafting Note: Applicability to the following three types of products is still under consideration: 1) Separate account products currently exempt from CARVM, 2) Products involving Separate Accounts that guarantee an index, which are excluded from the RBC Phase II proposal, and 3) Guarantees of mutual fund performance that are similar to GMDBs and/or VAGLBs but offered in contracts that do not provide a variable deferred annuity.

² Drafting Note: Definitions of other guaranteed benefits will be included as this document is expanded and requires the additional terms.

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below a given level or fail to achieve certain performance levels; and

- b. Only such guarantees having the potential to provide benefits whose present value as of the benefit commencement date may exceed the projected contract value are included in this definition.
- 4) Guaranteed Minimum Income Benefit (GMIB) is a VAGLB design for which the benefit is contingent on annuitization of a variable deferred annuity contract. The benefit is typically expressed as a contractholder option, on one or more option dates, to have a minimum amount applied to provide periodic income using a specified purchase basis.
- 5) Guaranteed Minimum Withdrawal Benefit (GMWB) is a VAGLB design for which the benefit is contingent on one or more withdrawals from a variable deferred annuity contract. The benefit typically guarantees that a minimum amount will be available to be withdrawn over a term specified in the contract.

B) Definitions of Reserve Methodology Terminology

- 1) Scenario Greatest Present Value. For a given scenario, the Scenario Greatest Present Value is the greatest present value, as of the projection start date, of the projected Accumulated Deficiencies for the scenario, subject to the constraints described in section VI(A).³
- 2) Modified Conditional Tail Expectation Amount. The Modified Conditional Tail Expectation Amount is equal to the numerical average of the (100-X)% largest values of the Scenario Greatest Present Values.⁴
- 3) Working Reserve. The Working Reserve is used only in the projections supporting the calculation of the reserve on the valuation date for the contracts falling under the scope of these requirements and shall equal the total of an amount for each contract equal to the larger of the contract cash surrender values and the present value of annuity benefits for contracts then eligible for guaranteed minimum income benefits (i.e., the contract is out of the waiting period for the guarantee).⁵

³ The greatest present value of Accumulated Deficiencies represents the largest cumulative loss, as defined in section V(D), for the scenario.

⁴ X has not yet been defined. Also, the reserve method ultimately recommended may be based on a "non-modified" CTE level or a percentile rather than MCTE.

⁵ The Working Reserve may be modified in future drafts to approximate the actual reserve determined using the requirements of this document and/or to include the effect of other VAGLBs such as GMWBs.

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- 4) Accumulated Deficiency. Accumulated Deficiency is an amount measured as of the end of a projection year and equals the projected Working Reserve less the amount of projected assets, both as of the end of the projection year. Accumulated Deficiencies may be positive or negative.⁶
- 5) Starting Asset Amount. The Starting Asset Amount equals the value of the assets at the start of the projection, as defined in section VIII)A).
- 6) Prudent Best Estimate. The assumptions to be used for modeling are to be the actuary's "prudent best estimate". This means that they are to be set at the conservative side of the actuary's confidence interval as to the true underlying probabilities for the parameter(s) in question based on the availability of relevant experience and its degree of credibility.

IV) Definition of New Reserve Approach

- A) General Description of Approach. The reserve net of reinsurance for all or a portion of the variable annuity contracts falling within the scope of this law/guideline/regulation shall equal the Aggregate Reserve determined as the sum of:
 - 1) The Modified Conditional Tail Expectation Amount; plus
 - 2) The Starting Asset Amount.
- B) General Description of Projections. The Aggregate Reserve is based on a projection of the variable annuity contracts, and the assets supporting the contracts, over a broad range of stochastically generated projection scenarios using prudent best estimate assumptions. In performing the projections, the contracts may be grouped as described in section V).
 - 1) For each scenario, projected aggregate Accumulated Deficiencies are determined for each projection year as the sum of the Accumulated Deficiencies for each contract grouping.
 - 2) The Scenario Greatest Present Value is determined for each scenario based on the aggregate Accumulated Deficiencies⁷ for the contracts for which the Aggregate Reserve is being computed.

⁶ Note that a positive Accumulated Deficiency means that there is a cumulative loss, as defined in section V)D) and a negative Accumulated Deficiency means that there is a cumulative gain, as defined in section V)D).

⁷ The Scenario Greatest Present Value is therefore based on the greatest projected Accumulated Deficiency, in aggregate, for all contracts, rather than based on the sum of the greatest projected Accumulated Deficiency for each grouping of contracts.

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- 3) The Scenario Greatest Present Values for all scenarios are then ranked from smallest to largest and the Modified Conditional Tail Expectation Amount is the average of the largest (100 - X)% of these ranked values.
- C) If the reserve as outlined above is determined for a number of contracts less than the total of all contracts falling within the scope of these requirements, then the Company's Aggregate Reserve for all variable annuity contracts shall be determined as the sum of the Aggregate Reserve amounts determined for each such number.

The projections shall be performed in accordance with sections V), VII)A), and VIII). The actuary must document the assumptions used for the projections and summarize the results obtained as described in section XII).

V) Projection of Accumulated Deficiencies

- A) Grouping of Contracts. Projections may be performed for each contract in force on the date of valuation or by grouping contracts into representative cells of model annuity plans using all characteristics and criteria having a material impact on the size of the reserve. Grouping shall be the responsibility of the actuary but may not be done in a manner that intentionally understates the resulting reserve.
- B) Grouping of Separate Account Assets and Account Values. The portion of the Starting Asset Amount and account values held in the Separate Account may be summarized for projection purposes into the fund categories described in section VII)B).
- C) Length of Projections. Projections of Accumulated Deficiencies shall run for as many future years as needed to ensure that no materially greater reserve value would result from longer projection periods.
- D) Calculation of Accumulated Deficiencies. The calculation of Accumulated Deficiencies within the projections shall be the negative of the cumulative sum of gains or losses for each projection period, where the gain or loss for each projection period equals revenues less Projected Contract Benefits, as described in section IX), and less expenses and taxes (including federal income taxes as specified below) for the period, reflecting prudent best estimate assumptions⁸. The calculation shall also assume that all resulting gains and losses are retained within the company except for amounts paid as policyholder dividends or accruing in other manner to the benefit of policyholders.

Revenues, expenses and taxes shall include, but not be limited to the following:

⁸ In the event any conflict exists between this description of Accumulated Deficiencies and the definition provided in section III)B)4), the definition shall prevail.

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- 1) Revenues: any assumed premium payments on contracts in force at the start of projections, investment income on General Account assets, change in asset values of assets held in a Separate Account, expense charges assessed against account values, premium loading, mortality and expense charges accessed against account values or deducted in determining subaccount unit values, or additional benefit charges.
- 2) Expenses and Taxes: premium taxes, commissions, company expenses on a basis consistent with that determined for asset adequacy analysis for the company, reinsurance costs or premiums, and the change in the Working Reserve. Federal income taxes shall be included in the calculation of Accumulated Deficiencies only after making allowance for deductions for the assumed approximate increase in tax reserves and any other tax deduction arising within the projection for which the company would be reasonably expected to be eligible.

VI) Determination of Scenario Greatest Present Values

- A) Scenario Greatest Present Values. For a given scenario, the Scenario Greatest Present Value is the largest present value, as of the projection start date, of the projected Accumulated Deficiencies defined in section III)B)4). For scenarios having at least one positive Accumulated Deficiency,⁹ the Scenario Greatest Present Value shall equal the greatest present value of those Accumulated Deficiencies. For scenarios that don't have a positive Accumulated Deficiency, the Scenario Greatest Present Value shall be zero.¹⁰
- B) Discount Rate. In determining Scenario Greatest Present Values, Accumulated Deficiencies shall be discounted using either the optional interest rates stochastically generated in the integrated model, or the forward rates used for investing positive cash flows from the projection of assets backing fixed account values, but in either case, with no reduction in discount rates for federal income taxes.

VII) Projection Scenarios

- A) Minimum Required Scenarios. The number of scenarios for which projected greatest present values of Accumulated Deficiencies shall be computed shall be

⁹ The term "at least one positive Accumulated Deficiency" means that the scenario has at least one cumulative loss, as defined in section V)D).

¹⁰ This assumes the requirement uses MCTE (see footnote 4 on page 2) and assumes the Assets at the Start of the Projection equal the Working Reserve (see footnote 11 on page 6).

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the responsibility of the actuary and shall be considered to be sufficient if any resulting understatement in total reserves is not material.

- B) Separate Account Asset Categories. Assets and account values held in the Separate Account may be summarized into the six standard categories described in ... (yet to be determined), or into categories determined by the actuary. Assignment of particular variable funds to these categories must be performed in recognition of the investment guidelines and objectives of the funds and in such a manner as to achieve the best match possible to the categories.
- C) Total Return Gross Wealth Ratios. Subaccount fund returns determined on a stochastic basis such that the distribution of the Total Return Gross Wealth Ratios meet the Calibration Criteria specified in section ...

VIII) Projection Assets

- A) Assets at the Start of Projections. The actuary shall identify a combination of all or a portion of the company's Separate Account and General Account assets supporting the contracts with which to start the projection. Values shall be the amounts held within the annual or quarterly statutory statement or separate account statement. The amount of such asset values shall equal the sum of the following items, all as of the start of the projection:
 - 1) all of the Separate Account assets supporting the contracts;
 - 2) an amount of assets held in the General Account equal to the Working Reserve as of the start of the projections less the amount in 1), above. This may result in a negative amount of General Account assets.¹¹

General Account assets chosen for use as described above shall be selected on a consistent basis from one reserve determination hereunder to the next.

- B) Valuation of Projected Assets. For purposes of determining the Accumulated Deficiency, the value of projected assets shall be determined in a manner consistent with their initial value at the start of the projection as described in section VIII)A), or if created during a projection, in a manner consistent with the value of the Assets at the Start of the Projection having similar investment characteristics.

¹¹ Drafting Note: The following issues are still under consideration:

- a. Should assets greater than the starting Working Reserve be allowed (with a corresponding adjustment to the results)?
- b. Should assets supporting the Risk Based Capital attributable to the contracts be allowed?
- c. Should other assets dedicated to the support of the contracts, including hedge assets, be allowed?
- d. How should assets in 2) be selected from all eligible General Account assets?
- e. If 2) above is negative, how should that be handled in the modeling?

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C) Separate Account Assets. Assets held in a Separate Account may be summarized into asset categories as described in section VII)B) and shall be projected using the Total Return Gross Wealth Ratios described in section VII)C) for each such fund category. The following projected amounts are to be removed from the Separate Account assets during each future projection period and transferred to the General Account Assets:

- 1) Separate Account assets supporting account values that are withdrawn as a result of full surrenders, partial withdrawals, or annuitized under a fixed annuity payout option;
- 2) Separate Account assets supporting account values that are paid as a death benefit;
- 3) asset based fees such as mortality and expense charges, fees for living or death benefit guarantees, and administrative expense charges;
- 4) Amounts projected to be transferred from the Separate Account to the General Account on account of assumed elections of GMIB benefits having a fixed value payout;
- 5) Amounts, if any, projected to be transferred from the variable account value to the fixed account value.

The following projected amounts are to be added to the projected Separate Account assets:

- 1) Premium payments; and
- 2) Assumed transfers, such as result from a Dollar Cost Averaging provision, from the General Account to the Separate Account.

At the end of each future projection period, Separate Account Assets must be equal to, or greater than, the total amount projected to be held in the variable funds summarized into the asset categories described in section VII)B). In the event projected Separate Account Assets are less than this amount, a loan from the General Account must be taken to make up the deficit.

D) General Account Assets. General Account assets shall be projected using assumed investment returns consistent with their book value and expected to be realized in future periods as of the date of valuation. Initial assets that mature during the projection and positive cash flows projected for future periods shall be invested at the forward interest rates implied by the swap curve in effect as of the valuation date, or, at the option of the actuary, using interest rates developed on a stochastic basis meeting the requirements of section ... (yet to be determined). Changes in General Account assets must reflect all elements of cash flow from the projections, net of the items specified in section VIII)C) and reflecting any loans as therein described. Disinvestments to provide funds for payment of benefits,

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expenses, or transfers to the Separate Account must be projected in a manner reflecting market values of the disposed assets consistent with the projected investment income on such assets and yields as projected to be available for similar new investments.

IX) Projected Contract Benefits

- A) Projected Account Values. Projected account values shall be determined separately for the portion held in a Separate Account and the balance held in the General Account and must reflect all the requirements of this section.
 - 1) Separate Account Projection. Summaries by asset category, as described in section VII)B), of the subaccount values at the start of the projection shall be projected reflecting all contract provisions relating to account value determination and using the Total Return Gross Wealth Ratios for each such fund category as defined in section VII)C), adding any account value bonuses, and subtracting any asset based fund charges (other than charges for investment management), such as charges for mortality and expense guarantees, charges for benefit guarantees, or other charges assessed as a percentage of account value.
 - 2) Fixed Account Projection. Account values shall be projected by reflecting all contract provisions relating to account value determination and shall be increased using credited interest rates determined by applying the methods used by the Company for this purpose, taking into account the rates of investment income used in projecting the portion of General Account assets associated with the fixed accounts as described in section VIII)D). Projected crediting rates shall reflect any bonus interest arrangements or interest rate guarantees, whether year-by-year or cumulative, or indexed to an external or internal referent.
 - 3) Elements of Account Value Projection. The determination of projected account values shall reflect:
 - (a) Crediting of any premiums assumed to have been paid into the Separate Account, General Account, or a combination thereof within projections along with any subsequent future growth on these amounts¹²;
 - (b) Deduction of any expense charges assessed against the total account value; and

¹² Premium payment assumptions are as described in section V)D)1) and future growth is described in sections IX)A)1) and IX)A)2).

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- (c) Any guaranteed benefits that might increase the account value, such as a guaranteed minimum accumulation value benefit, once requirements have been satisfied for the guaranteee to take effect.
- B) Contract Benefits. Contract benefits shall be determined using the contractual provisions and, where appropriate, shall be based on the projected account values.
 - 1) Contract Benefits shall include all guaranteed benefits and those anticipated by the actuary to be paid based on the economic and other conditions represented within a projection. This is to include amounts paid as contractholder dividends or additional benefits accruing to the contractholder from participation in company profits.
 - 2) Negative benefit amounts shall be included in Contract Benefits to reflect projected reinsurance recoveries. There may be reinsurance recoveries not related to a payment of benefits, such as at the end of a waiting period that qualifies a minimum account value benefit guarantee.
- C) Types of Benefit Payments: Benefit payments identified within the projections shall include, but not be limited to surrender payments, death benefits, annuity payments, contractholder dividends, or endowments arising out of the contract account value or by company practice with all benefit payments appropriately adjusted for reinsurance recoveries as described above.
- D) Treatment of Contingent Events: For contracts assumed to be converted to a payout status under living benefit guarantees contained in the contract, the projections may assume termination of the contract as an endowment for the amount of the reserve that would be required at such time for the payout annuity benefits, or at the actuary's option, keep such contracts in the projection, with the working reserve for these contracts set equal to the reserve required for the payout annuity.

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X) Reinsurance

XI) Simplified Factor Method. In lieu of the requirements of this section, the reserve for any contracts qualifying under section ... may be determined as the working reserve as of the valuation date, increased by the factors set forth in section ... (yet to be determined).

XII) Actuarial Memorandum. An actuarial memorandum shall be constructed documenting the methodology and assumptions upon which the aggregate reserve described in section IV)A) has been determined.

XIII) Annual Statement Reinsurance Reserves. The aggregate reserve determined as described in section IV)A) shall be reported within the Annual Statement and Separate Account Statements as the reserve net of reinsurance. The actuary shall use methods consistent with that described herein, with due allowance for reasonable approximations, to determine a reserve prior to reflection of reinsurance with the difference between these two reserves reported as the reinsurance reserve credit.¹³

XIV) Reserve for Separate Account Statement. The total reserve held in support of variable annuity contracts subject to this section shall be allocated first as an amount equal to the aggregate cash surrender values of all such contracts and held as a reserve in the Separate Account(s) statement, with any remaining reserve held in the General Account in support of the guarantees made within such contracts.¹⁴

¹³ This tentative recommendation reflects the desire to not require a doubling of the work specified under these requirements as would result from a direct calculation of reserves before and after reinsurance.

¹⁴ Recommended separation of total reserves into the component held in Separate Account statements and components held in the General Account have not yet been finalized.

C-3 Phase II Methodology for Reserves

List of Issues and Tentative Recommendations

Capital Approach (June Report)	Issue	Reserve Approach
<p>Applies to all variable annuities, including those without guarantees.</p> <p>Also includes guaranteed equity separate account products, as well as guarantees written as a separate contract and related to mutual fund performance.</p> <p>Does not apply to Variable Life or VUL.</p> <p>Variable annuities sold as fixed annuities are excluded from this proposal and are to continue to be handled as products subject to interest rate risk.</p> <p>The proposed approach produces the capital for the entire contract.</p>	Scope	<p>Tentative Recommendation</p> <p>Apply to all variable annuity contracts, including those without guarantees.</p> <p>Excludes variable annuities sold as fixed annuities (presumably these are subject to AG 33).</p> <p>Does not apply to Variable Life or VUL.</p> <p>Applies to entire variable annuity contract, not just the guarantee portion.</p> <p>Issues to be Resolved</p> <p>Separate account products currently exempt from CARVM.</p> <p>Separate accounts which guarantee an index (excluded from RBC proposal).</p> <p>Guarantees written as a separate contract and related to mutual fund performance.</p>
<p>Allow use of factor approach as an alternative in the cases of specific benefit types identified by the NAIC or immaterial blocks of contracts.</p>	Alternative Factor Approach	<p>Tentative Recommendation</p> <p>Allow use of factor approach for any cases where the factor method is allowed by capital requirements.</p> <p>Issues to be Resolved</p> <p>How many factor tables should be provided?</p> <p>Should other alternatives (e.g. Keel Method) be considered?</p> <p>How will factors remain reasonable—updates? Should company certify?</p>

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Capital Approach (June Report)	Issue	Reserve Approach
Requires 90 MCTE (Modified Conditional Tail Expectation).	Confidence Level	<p>Tentative Recommendation Use same method (MCTE) as capital requirements.</p> <p>Issues to be Resolved Is using CTE or a percentile approach instead of MCTE a bigger issue for reserves than for capital? What level (e.g. 65 MCTE or CTE) should be used for reserves?</p>
Results will be discounted using an after-tax rate, with adjustments to the results that reflect the tax-deductibility of various items.	Pre-tax vs. After-tax	<p>Tentative Recommendation Calculations will utilize the same results projected for capital, but will be discounted using a pre-tax rate.</p> <p>Issues to be Resolved It is desirable to use the same set of projections used for capital, so method of converting after-tax to pre-tax needs to be identified.</p>
Include future payments on existing business, but not new sales.	New Business	<p>Tentative Recommendation Same as capital requirements.</p> <p>Issues to be Resolved Is it appropriate to include future payments that are not contractually required?</p>
Use prudent best estimates based on company's own experience for assumptions. This means that they are to be set at the conservative side of the actuary's confidence interval as to the true underlying probabilities for the parameter(s) in question based on the availability of relevant experience and its degree of credibility.	Source of Assumptions	<p>Tentative Recommendation Use prudent best estimate assumptions consistent with capital requirements to avoid multiple sets of projections. Key is transparency and disclosure.</p> <p>Issues to be Resolved Is there a need for the use of a standardized mortality table? Should there be conservatism in assumptions that are not simulated?</p>

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Capital Approach (June Report)	Issue	Reserve Approach
Use prudent best estimates based on company's own experience for assumptions.	Expenses	<p><u>Issue to be Resolved</u> Is it appropriate under statutory and tax accounting requirements for expenses be explicitly modeled, or do they need to be estimated through other assumptions?</p>
Recommendation is being finalized. Initial assets may include some combination of the following: <ul style="list-style-type: none">- S/A assets;- G/A assets held in support of the fixed account portion of the assets, contract guarantees, or excess of S/A assets over S/A liabilities;- Assets supporting RBC for the contracts;- Other assets in support of the contracts (e.g. hedge assets)	Assets at Start of Projection	<p><u>Tentative Recommendation</u> Recommendation for capital will be reviewed, but the VARWG expects to use the same initial assets as capital requirements.</p> <p><u>Issues to be Resolved</u> Should internal hedging between VA and other contracts outside the scope (e.g., EIAs) be recognized? Should hedge assets be included? See Appendix A for more discussion.</p>
Use prudent best estimate of expected benefit amounts.	Projected Benefits	<p><u>Tentative Recommendation</u> Use prudent best estimate assumptions consistent with capital requirements to avoid multiple sets of projections.</p> <p>Contracts that assume conversion to a payout annuity may either be treated as a termination for the endowment amount of the reserve or may be kept in the projection. [May need to address inconsistency with RBC]</p> <p><u>Issues to be Resolved</u> Treatment of GPAFs with payout option.</p>

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Capital Approach (June Report)	Issue	Reserve Approach
Aggregation at the company level for all contracts falling under the scope.	Contract Grouping and Aggregation Level	<p>Tentative Recommendation Projections may be done on seriatim basis or on groups of representative cells.</p> <p>Contract grouping shall reflect all characteristics and criteria having a material impact on the size of the reserve.</p> <p>Issues to be Resolved Is there a need to allocate the aggregated reserve back to contract level for grouped contracts (e.g., for tax purposes)?</p>
Allows for grouping of funds into fewer modeled categories by type (e.g., Morningstar classes). Calibration to the S&P 500 is still required for non-index funds, with appropriate adjustment for efficient frontier (risk/return) differences by fund characteristic.	Fund Grouping and Aggregation Level	<p>Tentative Recommendation Use fund grouping consistent with capital requirements to avoid multiple sets of projections.</p>
Not applicable for capital.	Reserve Floor for Results	<p>Tentative Recommendation Requirements already result in CSV floor.</p> <p>Issues to be Resolved Is there a need for an additional reserve floor? If so, should the floor be temporary or permanent?</p>
Requires working reserves equal to the larger of the contract cash surrender values and the present value of annuity benefits for contracts then eligible for guaranteed minimum income benefits (i.e., the contract is out of the waiting period for the guarantee).	Reserve Assumed in the Projections (Working Reserve)	<p>Tentative Recommendation Recommendation for capital will be reviewed, but the VARWG expects to use the same working reserve definition as capital requirements.</p> <p>Issues to be Resolved Should definition of working reserve include the greatest of any immediately exercisable policyholder options (e.g. GMIB, GMWB)?</p> <p>Should reserves be based on projected cash flows instead of statutory gains/losses? Greatly simplifies reserve projections, while still using CSV floor for capital.</p>

Appendix B

Capital Approach (June Report)	Issue	Reserve Approach
<p>Integrated interest rate models are allowed but not required. For fixed account earned rate, the implied forward rates from the swap curve must be used in the absence of an interest rate model.</p> <p>Assumption must be consistent with current market conditions.</p> <p>Insurer would take actual allocated assets for the fixed account, AV + reserve for guarantees (above AV), and project forward.</p> <p>Note that more discussion on the treatment of this issue for capital is taking place.</p>	Projection Interest Rates	<p>Tentative Recommendation Recommendation for capital will be reviewed, but the VARWG expects to use the same interest rate assumptions as capital requirements.</p> <p>Issues to be Resolved The VARWG needs to consider the possibility that this requirement may result in a need for some companies to perform a separate tax reserve calculation.</p>
<p>Integrated interest rate models are allowed but not required. For fixed account earned rate, the implied forward rates from the swap curve must be used in the absence of an interest rate model.</p> <p>Guidance is provided for the creation and use of an integrated interest rate model.</p>	Discount Interest Rates	<p>Tentative Recommendation Use discount interest rates consistent with capital requirements to avoid multiple sets of projections.</p> <p>Issues to be Resolved Question of “disconnect” if minimum interest rate (statutory or tax) differs significantly from forward curve; however, this may be a real difference, and therefore desirable to include in modeling.</p>
Does not differentiate between separate account and general account requirements.	Reserve in Separate vs. General Account	Preliminary guidance provided in Section XIV of Appendix A.
Allows a company to incorporate reinsurance directly into the calculation.	Reinsurance	<p>Tentative Recommendation Reinsurance treatment should be consistent with capital requirements to avoid multiple sets of projections.</p> <p>Issues to be Resolved Actual calculation method of direct, assumed and ceded reserves needs to be addressed.</p>

Appendix B

Capital Approach (June Report)	Issue	Reserve Approach
Approach has not yet addressed timing. Alternatives are being discussed such as using September data or using a year-end estimate with provision for an update to the result if final results differ materially.	Timing of Producing Results Relative to Reporting Deadlines	This issue has not yet been addressed for reserves. It is not clear whether treatment needs to be consistent with capital requirements.
Time period of projection is not explicitly defined. Discussions have taken place about the possibility of limiting the time period (e.g. 20 years).	Time Period	Recommendation for capital will be reviewed, but the VARWG expects to use the same projection time period as capital requirements.
Allows a company to incorporate hedges if the insurer is following a clearly defined hedging strategy.	Hedges	<p>Tentative Recommendation Hedge treatment should be consistent with capital requirements to avoid multiple sets of projections. Effectiveness of hedging must be considered.</p> <p>Issues To Be Resolved Does incorporating hedge assets in the reserve calculation create any accounting issues?</p>