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

Chicago, IL – September 2003

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Variable Annuity Reserve Work Group

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American Academy of Actuaries
Variable Annuity Reserve Work Group
Executive Summary

Action Items For LHATF:

- Timeline for adoption of new reserve requirements

- Form of requirements: Actuarial Guideline, Model Regulation, or Amended SVL

- Whether to apply new reserve requirements to business already inforce

- CTE level for reserve determination (e.g., CTE 60)

Numerical Results Obtained Thus Far For VAs with GMDBs:

- During the surrender charge period (for products modeled):

    - ✓ Proposed Reserves are often less than Current Reserves

    - ✓ Total Asset Requirement[*] (TAR) is less than Current Reserves for some benefit designs (e.g., ROP and MAV)

    - ✓ TAR is greater than Current Reserves for other benefits

- Beyond the surrender charge period (for products modeled):

    - ✓ Proposed Reserve and TAR are typically higher than Current Reserves

- Proposed CTE Reserves are above the 86th Percentile (for products modeled)

    - ✓ Often they are above the 90th Percentile

    - ✓ CTE captures more of the tail risk than an 80-85 percentile measure (for products modeled)

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[*] The total capital requirement used in the determination of RBC proposed by the Academy C-3 Phase II Work Group.

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 is continuing to examine the effectiveness of such a methodology, and is identifying and commenting 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.

The VARWG is currently in the process of developing a reserve methodology that, if adopted, could be applicable to all variable annuity products. Such a methodology could replace, where appropriate, the application of Actuarial Guideline (AG) XXXIII to variable annuity contracts and totally replace AGs XXXIV and XXXIX[1].

This report summarizes the work of the VARWG since the June 2003 NAIC meeting. The VARWG requests comments and input from LHATF on the content of this report and the general direction of these initiatives. In particular, the VARWG would like to get specific direction from LHATF on the following issues:

1. The regulatory form that the new reserve methodology should take (i.e., should the new method be promulgated as an actuarial guideline, a model regulation, or a revision to the model Standard Valuation Law).

2. Whether it is desired that the new reserve methodology apply to all or some inforce contracts.

3. The level at which reserves calculated using this methodology should be set.

4. Whether the timeline proposed by the VARWG at the June 2003 LHATF meeting (and discussed on the August 21 conference call) for adoption of a new reserve requirement should be followed and, if not, what changes to the timeline should be made.

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[1] For purposes of this paragraph, it is important to note that no proposal has been made by either the VARWG or LHATF as to whether the reserve methodology, if adopted, would apply to inforce contracts or only to contracts issued after the effective date of the reserve methodology.

5. Issues raised by the joint LHATF/Life Risk Based Capital Working Group (LRBCWG) subgroup examining the regulatory oversight/review process that may affect the work products of the VARWG [2].

II. Update of Key Issues

A. Timeline

During the June 2003 LHATF meeting and the August 21 LHATF conference call, the timeline shown below was discussed. This timeline would allow a standard to be adopted by the NAIC by the end of 2004, as was discussed at the June meeting[3]. It also provides for at least six months of exposure and comment.

Since the timeline requires the VARWG to make a proposal to LHATF by the December NAIC meeting, it is important that LHATF commit to this or an alternative timeline at the September 2003 NAIC meeting.
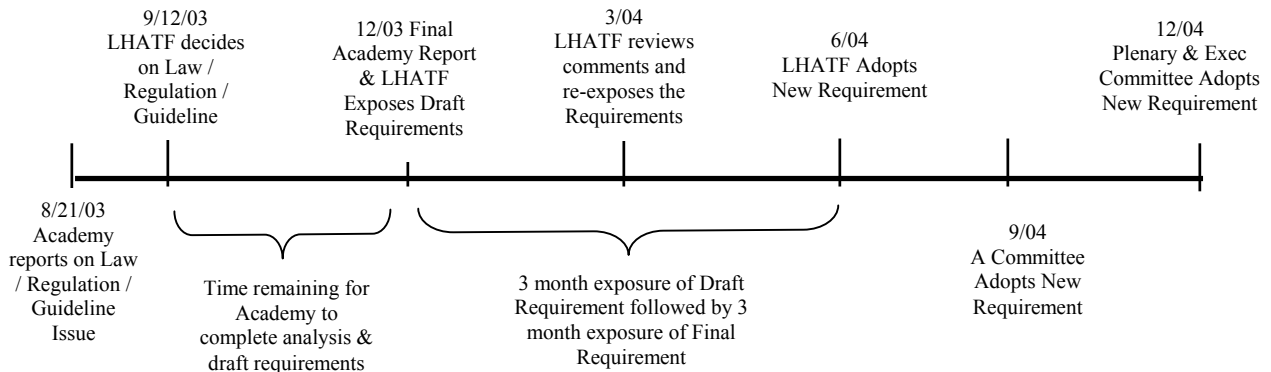
Action items:

1. *VARWG would like a commitment from LHATF on this or an alternative timeline.*

2. *VARWG would like LHATF to focus on the other key issues raised in this report to allow the VARWG to meet the deadline of a final report and exposure of a proposed draft by the December 2003 LHATF meeting.*

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[2] This topic is not discussed further in this report, but is included because the VARWG believes this is an important aspect of implementing new reserve and RBC requirements.

[3] Note that this does not necessarily mean that a new reserve standard will be in effect for year-end 2004. For example, if the standard is adopted as an actuarial guideline, it is possible that the effective date might be later than 12/31/2004. Also, if the standard were adopted as either a model regulation or a revision to the model SVL, the standard would have to be adopted by individual states before it would be effective.

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 various regulatory forms a new reserve methodology could take. Based on feedback from LHATF and others, the VARWG expanded this analysis to include the use of a model regulation. Appendix A outlines the issue, and presents alternatives along with advantages and disadvantages of each. This document is very similar to the document that was discussed during the August 21 LHATF conference call except for modifications to recognize the possibility of developing an actuarial guideline interpreting the NAIC Variable Annuity Model Regulation. Note that the timeline proposed above calls for LHATF to decide on this issue at the September 2003 NAIC meeting.

Action items:

1. ***VARWG would like definitive direction from LHATF on the regulatory form of the requirements.***

C. Applicability of the New Reserve Methodology to Inforce Contracts

An issue that is very closely related to the regulatory form is whether it is desired that the new reserve methodology apply to all or some inforce contracts. This decision may be constrained by the regulatory form (e.g., it may be argued that a revision to the model Standard Valuation Law cannot be applied to inforce contracts). Appendix A comments on this issue, where appropriate. Since the issue of application to inforce contracts can impact, and be impacted by, the regulatory form of the requirements, the two issues should be considered in tandem.

The VARWG has identified the following pros and cons, in addition to those related to the form of the requirement, of requiring the new reserve methodology to apply to inforce contracts[4]:

1. Pros
   - Allows the new reserve method to reflect all of the company's variable annuity risks in a coherent framework.
   - Addresses issues for inforce contracts that may not be covered by the current reserve method. For example:
     (a) dollar for dollar Guaranteed Minimum Death Benefits (GMDBs),
     (b) "up-side" GMDBs, and
     (c) the sunset provision for AG 39.
   - Consistency with both the direction of, and the calculation of, the proposed RBC approach.

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[4] Since many of these points are made in Appendix A in conjunction with the regulatory form, the pros and cons are in somewhat of a summarized form. More details on these points can be found in that Appendix.

2. Cons
   - There are fundamental differences between the proposed and the current reserve methods.
   - Could result in both methodology differences between tax reserves and statutory reserves, and a decrease in tax reserves for inforce contracts.
   - Applying a new reserve requirement to inforce contracts within a new model regulation or a revised model law has not been done before (to VARWG's knowledge).

Action items:

1. *VARWG would like more direction from LHATF on whether the requirement should apply to inforce contracts.*

D. Reserve Methodology Issues

The VARWG continues the process of identifying and addressing key methodology issues. The June 2003 report included a list of methodology issues still open at that time. Since that report was submitted, the VARWG has reviewed these issues, has added more issues, resolved several issues, and has begun the process of recommending potential solutions for others. Appendix B of this report summarizes the outstanding issues that need to be resolved before the final report is presented in December.

Action items:

1. *VARWG would like direction from LHATF on the methodology issues summarized in Appendix B.*

2. *VARWG would particularly like more direction from LHATF on the level at which reserves should be set (see section II.E. below).*

E. Analysis of Reserve Methodology Modeling Results

The VARWG performed sample calculations for the proposed reserve methodology at both the CTE (60) and CTE (65) levels. The calculations parallel the work that has been performed by the Academy's RBC C-3 Phase II Work Group. In addition to modeling the same product specifications as the RBC group (referred to herein as the Standard Product), results were also calculated for an Alternate Product under which the mortality and expense charge was reduced by 0.25% and a lower average size was assumed[5]. Appendix C contains a more complete description of the modeling performed so far along with numerical results.

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[5] The reduction in average size results in approximately 5-6 basis point increase in expenses.

The following observations were taken from the results of the analysis of the modeled products:

1. The proposed reserves were compared to the Total Current Reserves[6]. After the surrender charge period, the proposed reserves exceed the Total Current Reserves for the products modeled. During the surrender charge period, however, the comparison of the proposed reserves and the Total Current Reserves for the products modeled is mixed (sometimes lower and sometimes higher). As the benefit goes deeper into the money for the Roll-up and High death benefit designs modeled[7], the proposed reserves appear to better reflect the possibility of underperformance relative to the roll-up rate for the products modeled.

2. The reserve calculation results, expressed on a CTE basis, were compared to the results on percentile basis[8]. For the products modeled, the results at both CTE (60) and CTE (65) are always larger than the 85th percentile. In many cases, a CTE (60) level results in reserves at least as large as the 90th percentile. This shows that using a CTE basis captures the tail risks better than a percentile basis for the products modeled.

3. The results on a CTE (90) Total Asset Requirement basis[9] were compared to the Total Current Reserves. For the products modeled, the ratio of the Total Asset Requirement to the Total Current Reserves increase as the death benefit is more "in-the-money". This is an indication that the C-3 Phase II approach, which appears to capture more of the tail risk than the Total Current Reserves, increases the Total Asset Requirement to reflect the increases in risk resulting from the greater "in-the-moneyness" for the products modeled. This can be seen, in particular, by looking at the Roll-up and High death benefit designs.

It is important to note that these observations may not hold true for other product designs or specifications.

Action items:

1. *VARWG would like direction from LHATF on the level at which reserves should be set.*

2. *VARWG would like feedback from LHATF if additional information is needed to help determine the reserve level.*

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[6] The Total Current Reserve is the Integrated Reserve computed under Actuarial Guideline XXXIV (i.e., the total contract reserve before deducting the Separate Account Reserve), but never less than the cash surrender value on the assumed valuation date.
[7] See Appendix C for definitions.
[8] That is, the same distribution of results by scenario, but a different criteria for choosing the results.
[9] Total Asset Requirement refers to the CTE (90) basis being proposed for RBC, and is before the deduction for the actual reserve being held by the company. It also reflects an after-tax discount rate.

III. Next Steps

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

A. Finalize the document contained in the VARWG June 2003 Report that describes the methodology (including putting that document into the appropriate regulatory form).

B. Address the methodology issues, make any necessary recommendations, and incorporate the resolution of these issues into the methodology document.

C. Continue to explore the potential impact of the methodology on tax issues.

D. Continue the modeling of reserves with focus on providing information to help determine the level at which reserves should be set.

E. When and where appropriate, identify the need for professional and practical guidance and begin the process to help develop the guidance.

F. Update the timeline to reflect LHATF input.

G. Develop a final report for the December 2003 NAIC meeting, assuming LHATF supports the proposed timeline. This will allow LHATF to expose, by the end of 2003, a proposal for comment.
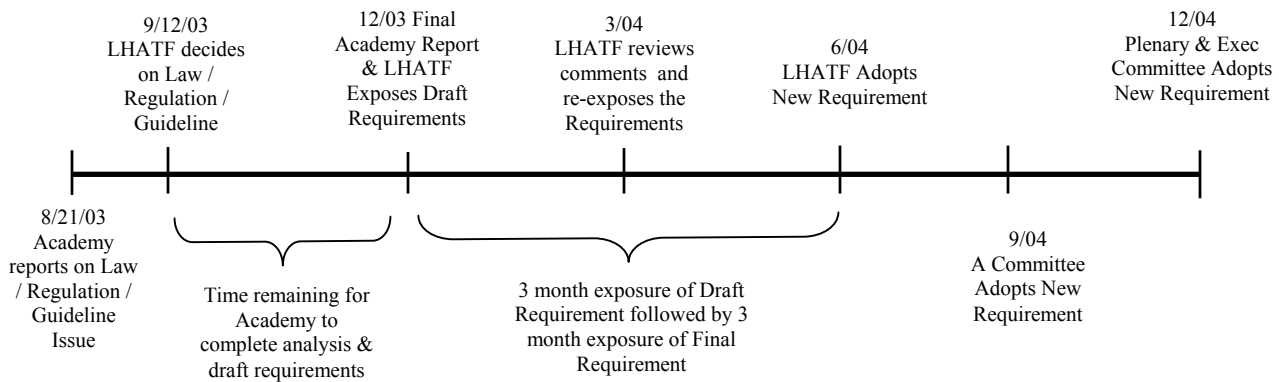
The VARWG plans to continue to update LHATF on its progress at future NAIC meetings and on interim conference calls.

Variable Annuity Reserve Work Group Analysis:
Promulgating the New Reserve Method for Variable Annuities

In this document, the Variable Annuity Reserve Work Group (VARWG) of the American Academy of Actuaries is presenting the results of its analysis regarding the advantages and disadvantages of the three possible approaches to promulgating the new reserve requirements described in the VARWG's June 2003 Report: Adoption of i) an actuarial guideline, ii) a model regulation pursuant to Section 9 of the Standard Valuation Law, or iii) a new or modified model law.

During the June 2003 LHATF meeting, the VARWG discussed a timeline for adoption of the new requirements. The timeline presented is shown below. In order to meet this timeline, it would be necessary that LHATF decide soon which of the three approaches to promulgating the new reserve requirements it would most like to pursue. This is because the VARWG will need time to draft suggested language for the law, regulation or guideline for the December 2003 LHATF meeting. In addition, certain issues depend on which option is chosen, such as applicability of the new reserve method to in force contracts. The following timeline shows the sequence of events the VARWG anticipates in order for the new requirements to be adopted in a timely manner. Adopting this timeline would mean that as of the August 21, 2003 LHATF conference call, there would be approximately four months time for the VARWG work to be completed.

| 9/12/03 LHATF decides on Law / Regulation / Guideline | 12/03 Final Academy Report & LHATF Exposes Draft Requirements | 3/04 LHATF reviews comments and re-exposes the Requirements | 6/04 LHATF Adopts New Requirement | 12/04 Plenary & Exec Committee Adopts New Requirement |

8/21/03
Academy reports on Law / Regulation / Guideline Issue

Time remaining for Academy to complete analysis & draft requirements

3 month exposure of Draft Requirement followed by 3 month exposure of Final Requirement

9/04
A Committee Adopts New Requirement

There are three approaches being discussed by the VARWG:

1. Adopt the new method as an actuarial guideline such that the new method is considered a new interpretation of Commissioners' Annuity Reserve Method (CARVM) for variable annuities.

2. Adopt the new method as a model regulation under Section 9 of the NAIC Model Standard Valuation Law (SVL) such that the proposed reserve method becomes the reserve method for variable annuities. The approach of using a model regulation might also require an actuarial guideline to specify the details of the method and clarify its applications.

3. Incorporate the new method in a new subsection to SVL such that the new reserve method is identified in SVL as the reserve method for variable annuities. This approach would likely require a model regulation or an actuarial guideline to specify the details of the method and clarify its applications.

(The remainder of this appendix summarizes the practical implications of these three approaches.)

I.   <u>Adopt the New Method as an Actuarial Guideline</u>

An AG could be adopted as a revised interpretation of section 5a of the SVL. Alternatively, it could be adopted as an interpretation of section 6E of the NAIC Variable Annuity Model Regulation (VA Model Reg), which states that

> *The reserve liability for variable annuities shall be established pursuant to the requirements of the Standard Valuation Law in accordance with actuarial procedures that recognize the variable nature of the benefits provided and any mortality guarantees.*

Advantages of adopting the new method as an actuarial guideline interpreting CARVM include, but are not limited to, the following:

- The new requirements can become effective in the shortest amount of time,

- The effective date of the new requirements would be the same in almost all states,

- Uniform reserve guidance among states,

- The new requirements can be applied to all inforce variable annuity contracts on a statutory basis, if it is desired, and

- Subsequent modifications can be made more easily and quickly.

Potential obstacles to adopting the new method as an actuarial guideline are:

1. As there are fundamental differences between the new reserve method and current CARVM, it may be difficult to justify adopting the new reserve method as an interpretation of CARVM through an actuarial guideline. Fundamental differences between the new reserve method and the current CARVM include (a) using a model-based approach incorporating assumptions regarding various aspects of policyholder behavior, (b) incorporating "renewal premiums" not required to be paid and company expenses, (c) using best estimate mortality assumptions rather than standardized mortality tables, and (d) discounting reserves at interest rates other than those specified in the Standard Valuation Law.

2. Current CARVM emphasizes the concept of greatest present value of guaranteed benefits. The new reserve method uses the conditional tail expectation (CTE) applied to the greatest of projected future losses for each stochastic scenario. One may argue that CTE deviates from the greatest present value of guaranteed benefit concept. A counter-argument is that the CTE measure is based on a comparable concept because the new method focuses on the greatest present value of projected losses under a variety of stochastic scenarios.

3. If the new method is promulgated as an actuarial guideline to be applicable to inforce contracts, it may not ultimately prove to be the method required by the US Department of the Treasury (Treasury) for the calculation of tax reserves on inforce contracts due to Treasury positions recently taken.

4. If the new method is promulgated as an actuarial guideline, the scope of applicability of the new method may be limited by the current scope of CARVM (in the case of an actuarial guideline that reinterprets section 5a of the SVL) or may only apply to variable annuities (in the case of an actuarial guideline that interprets the VA Model Reg). That is, contracts such as group life contracts insuring benefit guarantees of mutual fund customers that are not subject to current CARVM may not be subject to the new reserve method.

II. Adopting the New Method as a Model Regulation Under Section 9 of the Standard Valuation Law

This approach specifies the new method is an enhancement of the current CARVM for variable annuities. Because the technical aspects of the new reserve method may be too complicated to be included in a model regulation, this approach would likely require the NAIC to adopt a supporting actuarial guideline.

Section 9 of the SVL states that

In the case of a plan of life insurance that provides for future premium determination, the amounts of which are to be determined by the insurance company based on then estimates of future experience, or in the case of a plan of life insurance or annuity that is of such a nature that the minimum reserve cannot be determined by the methods described in Section 5, 5a, and 8, the reserves that are held under the plan shall:

A.   Be appropriate in relation to the benefits and the pattern of premiums for that plan; and

B.   Be computed by a method that is consistent with the principles of this Standard Valuation Law, as determined by regulations promulgated by the commissioner.

Thus, the law specifies that if the minimum reserve for a contract cannot be determined using methods specified in the SVL (e.g., CARVM under Section 5a) due to the nature of the underlying contract, a different reserve methodology may be used to calculate the minimum reserve for the contract if the reserve method satisfies conditions (A) and (B) stated above.

Condition (A) calls for appropriate recognition of benefits and premium patterns. Benefits would include guaranteed living and death benefits, and other benefits as well. Condition (A) may also be used to argue for the recognition of renewal premiums, as are recognized under the new reserve method.

Condition (B) requires the reserve method to be consistent with the principles of the SVL, as determined by regulations and promulgated by commissioners.

The language in the VA Model Reg (see section I. above) may further support using this approach.

Advantages of adopting the new method as a model regulation include, but are not limited to, the following:

- The new method is considered a new reserve valuation method for variable annuities and any fundamental differences between the new method and current CARVM are irrelevant if it is adopted as a new model regulation, and

- The scope of applicability of the new method may be expanded to include contracts that are currently not subject to CARVM such as the group life contracts described earlier.

Practical challenges of adopting the new reserve method with reference to section 9 of SVL include, but are not limited to, the following:

1. The adoption of a model regulation with reference to the SVL may be time consuming and may not achieve uniformity among states in the reserve requirements ultimately adopted.

2. The timing of adoption of the new regulation could result in varying reserve requirements on a state-by-state basis over time.

3. It is unclear whether a model regulation could be applied to all inforce variable annuity contracts, if that is desired.

III.   <u>Adopting the New Method as a New Section of the Standard Valuation Law</u>

The third approach is similar to the second approach discussed above in that it also suggests that the proposed method is an enhancement of the current CARVM for variable annuities. The approach involves amending the SVL to specify new reserve requirements for variable annuity business. Under this approach, a new section would be added to the SVL (Section 5b, say) requiring the new reserve method. Because the technical aspects of the new reserve method will likely be too complicated to be included in the SVL, this approach would likely require the NAIC to adopt a supporting actuarial guideline.

Major advantages of this approach include:

- The new method is considered a new reserve valuation method for variable annuities and any fundamental differences between the new method and current CARVM are irrelevant if it is promulgated as a revision to the model SVL, and

- Expansion of scope to cover other guarantees of benefits such as those provided under the group life contracts described earlier.

Potential difficulties related to the third approach are comparable but slightly different from the second approach. They include the following:

1. Adopting an amended model law can be even more time consuming than adopting a new model regulation.

2. It is unclear whether a revision to the model SVL could be applied to all inforce variable annuity contracts, if that is desired. However, one area of precedence may be the change to the model SVL that incorporated the requirement for an actuarial opinion and memorandum (Section 3), which did apply to business already inforce.

3. May be more difficult to make subsequent modifications. However, this can be mitigated by having the details appear in a supporting actuarial guideline.

4. Other unrelated proposed changes to the SVL may produce additional delays, both in construction of the model law and in adoption by the various states.

5. Some states may modify the model law during the adoption process, which would result in a lack of uniformity by state.

Comparison of Approaches to Adoption of New Reserve Requirements

Aspect	Actuarial Guideline	Model Regulation	Amend SVL
1. **Timeliness and Efficiency of Adoption**	Most efficient	More efficient than the SVL approach	Lengthy process involving state legislatures
2. **Uniformity among States**	Uniform for vast majority of states	Uniformity may be helped by Codification	Possibility for lack of uniformity
3. **Effect of fundamentally different approach**	Makes it challenging to adopt as a guideline	Accommodates fundamentally different approach	Accommodates fundamentally different approach
4. **Expansion of scope outside variable annuities**	May be limited to scope of CARVM	May expand to include contracts not subject to CARVM	May expand to include contracts not subject to CARVM
5. **Subsequent Modifications**	Can be made by revising the actuarial guideline	May require a new model regulation unless there is an actuarial guideline supporting the regulation that could be modified	May require a new model law unless there is an actuarial guideline supporting the modified SVL that could be modified
6. **Applicability to contracts already in force**	Applicable for statutory reserves but uncertain whether applicable to tax reserves	Unclear as to whether the new requirements could apply to business already in force.	May be difficult due to tradition of not applying to business already in force

C-3 Phase II Methodology for Reserves
Summary List of Issues

	Issue	Reserve Approach
1	**Scope**	Want consistency with the capital approach, i.e., include product types a, c and d, but not b. a. Separate account products currently exempt from CARVM. b. Separate accounts which guarantee an index (excluded from RBC proposal). c. Guarantees written as a separate contract and related to mutual fund performance. d. Contracts sold as fixed annuities. The regulatory form of the requirement will determine the feasibility of maintaining consistency. *Example: An AG that reinterprets SVL Section 5a may not be able to include a above in its scope.* Although it may possible to have an AG that applies to, say, both SVL Section 5a and a. above.
2	**Alternative Factor Approach**	A. How many factor tables should be provided? B. How will factors remain reasonable—updates? Should company certify?
3	**Confidence Level**	A. Is using a percentile approach instead of CTE a more appropriate for reserves than for capital? B. What level (e.g., 65 CTE) should be used for reserves?
4	**Source of Assumptions**	Should there be conservatism in assumptions that are not simulated?
5	**Expenses**	Is it appropriate under statutory and tax accounting requirements for expenses be explicitly modeled, or do they need to be estimated through other assumptions?
6	**Assets at Start of Projection**	A. Should internal hedging between VA and other contracts outside the scope (e.g., EIAs) be recognized? B. Should hedge assets be included?
7	**Projected Benefits**	A. Treatment of GPAFs with payout option. B. 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]*
8	**Contract Grouping and Aggregation Level**	The VARWG believes there is a need to allocate the aggregated reserve back to contract and needs to develop a method to do so.

	Issue	Reserve Approach
9	**Reserve Floor for Results**	Is there a need for an additional reserve floor? If so, should the floor be temporary of permanent?
10	**Reserve Assumed in the Projections (Working Reserve)**	Is there a need for anything other than cash surrender value?
11	**Projection Interest Rates**	A. Should the forward swap rate curve be used for the fixed account options and GMIB purchase rates, or should fixed interest rates be modeled differently? B. 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.
12	**Discount Interest Rates**	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.
13	**Reserve in Separate vs. General Account**	A method is needed to allocate the aggregate reserve to the separate account and the general account.
14	**Reinsurance**	Actual calculation method of direct, assumed and ceded reserves needs to be addressed.
15	**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.
16	**Time Horizon**	Recommendation for capital will be reviewed, but the VARWG expects to use the same projection time period as capital requirements.
17	**Valuation Frequency/Use of Estimates**	A. How often should modeling be used to determine reserves (e.g., annually, quarterly)? B. If not quarterly, what types of "estimate" are appropriate for quarterly reporting? C. Does the actuary have an option for reserves on the frequency of measurement (e.g. if quarterly model, can the actuary determine reserve either quarterly or annually?)
18	**Hedges**	Does incorporating hedge assets in the reserve calculation create any accounting issues?

Analysis of Reserve Methodology Modeling Results

Background

Subsequent to the June Report, the VARWG calculated reserves using one of the models used by the Academy RBC C-3 Phase II Work Group[10]. Reserves were calculated using the proposed methodology at two levels: CTE (60) and CTE (65). In addition to modeling the same product specifications as the RBC group (referred to herein as the Standard Product), results were also calculated for an Alternate Product under which the mortality and expense charge was reduced by 0.25 percent and a lower average size was assumed[11]. This allowed the VARWG to explore the sensitivity of the results to differences in product specifications. As with the RBC modeling, the projection for each cell assumed that the insured was a male <u>attained</u> <u>age</u> 65 at the start of the projection. Except as noted above, the same experience assumptions were generally used as with the RBC modeling.

Total Current Reserves

Reserves for the products modeled were also calculated using the current reserve methodology. This is referred to as the Total Current Reserve in this appendix, and equals the Integrated Reserve computed under AG XXXIV (i.e., the total contract reserve before deducting the Separate Account Reserve), but never less than the cash surrender value on the assumed valuation date. The calculation of the Total Current Reserve assumes continuous CARVM. The possibility of future annuitization at the guaranteed purchase rates was reflected in the reserve calculation. The net amounts at risk used in the calculation were computed assuming that 100 percent free partial withdrawals (10 percent per year of total considerations) are taken, and which reduce the death benefit in the integrated benefit stream on a proportional basis. The valuation mortality table assumed is the 1994 MGDB ALB with valuation interest of 6.5 percent.

Death Benefit Designs

The same five death benefit designs and the same five starting net amounts at risk (i.e., in-the-money levels) were used as with the RBC work. These death benefit designs, which are described in more detail in the Academy RBC reports, are summarized below:
- <u>ROP</u>: guaranteed minimum death benefit equals the single premium (hence a return of premium, or ROP); additional charge of 0.05 percent.
- <u>Roll-Up</u>: guaranteed minimum death benefit equals the single premium accumulated at 5% interest to age 80 with a cap equal to 250 percent of premium; additional charge of 0.20 percent.
- <u>MAV</u>: guaranteed minimum death benefit is the maximum anniversary value (or annual ratchet) to age 80; additional charge of 0.15 percent.
- <u>High</u>: guaranteed minimum death benefit is the larger of the Roll-up or MAV benefits; additional charge of 0.25 percent.

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[10] The C-3 Phase II modeling was performed by six teams, each employing its own model. The model used by the VARWG for this analysis is one of these six models and, unlike the model used to produce the proposed RBC GMDB factors, the model used for this analysis does not treat partial withdrawals differently than full surrenders. It also assumes only a proportional adjustment to the death benefit for partial withdrawals (no dollar-for-dollar withdrawals have been assumed). The effect of including partial withdrawals with full surrenders understates company expenses inasmuch as no continuation of a reduced-size policy with continuing administrative expenses is reflected in the results. However, it is believed the impact of this on results is minimal and that this difference does not materially impact the comparisons being made in this appendix.

[11] The reduction in average size results in an increase in expenses of approximately 5-6 basis points.

- <u>EDB</u>: death benefit combines a ROP with a Gain Death Benefit (under which the death benefit is increased by 40 percent of the gain in the contract subject to a cap of 40 percent of premium; the amount by which the contract is "in the money" (ITM) is determined with reference to the ROP benefit component; additional charge is 0.25 percent (including the 0.05 percent charge for the ROP benefit).

Review of Results

In reviewing the results, it is important to note the following:
- Results presented assume gross investment performance consistent with the S&P500.
- Since the calculations are sensitive to the actual product features and charges and to the experience assumptions used, care must be taken in generalizing the results to a specific company and/or a different product.
- Results are presented on a "unit basis" (that is, the results of each cell are independent from any other cell). When models of actual company results are created, the effect of aggregation will be to reduce the Total Asset Requirement for RBC determination and to reduce reserves, as well. One cannot simply weight together the unit results displayed in this appendix to see the effect of a mixed portfolio of products and durations, as the effect of aggregation would thereby be ignored.
- Since an attained age of 65 is used for all durations, results at different durations may not necessarily be representative of the results over the life of a single contract.

Numerical Results

The following information is shown in the attached tables:

1. The required amount in excess of cash values (Extra Amount), expressed as a percent of Account Value, for the following items:

   a. Total Current Reserves,
   b. Total Proposed Reserves - CTE (60),
   c. Total Proposed Reserve - CTE (65), and
   d. Proposed Total Asset Requirement - CTE (90) (at after-tax discount rate).

2. The ratio of the Total Proposed Reserves -- at both CTE (60) and CTE (65) -- to the Total Current Reserves. No result is shown for the EDB product as no generally accepted methodology is in place to calculate the Total Current Reserves.

3. For a given CTE level, the percentile producing approximately equivalent reserves is shown (Equivalent Percentile for CTE). This is intended to show the single percentile that would produce numerically equivalent reserves to that produced by the CTE level. The CTE measure, unlike a percentile criterion, averages the reserves at all percentiles above a minimum level. For a given CTE level, the percentile producing approximately equivalent reserves is shown (i.e., the percentile level for which the CTE based reserve equals the percentile based reserve, with all reserves based on the same set of scenarios). For example, the CTE (60) reserve for a particular product, duration and "in-the-moneyness" might be numerically close to the same reserve at the 87th percentile. Results are shown for both CTE (60) and CTE (65).

4. The ratio of the estimated Total Asset Requirement proposed by the Academy for RBC (i.e., CTE (90) on an after-tax discounting basis) to Total Current Reserves. As above, no result is shown for the EDB product as no generally accepted methodology is in place to calculate the Total Current Reserves.

TABLE 1
Required Amounts in Excess of Cash Value Expressed as a Percent of Account Value

		Standard Product					Alternate Product				
	Return of Premium	**-40%**	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
3.5	Total Current Reserve	0.00%	0.17%	0.31%	1.24%	2.94%	0.06%	0.28%	0.51%	1.77%	3.57%
	Total Proposed Reserve - CTE (60)	0.00%	0.01%	0.05%	0.25%	0.98%	0.00%	0.02%	0.11%	0.55%	1.62%
	Total Proposed Reserve - CTE (65)	0.00%	0.01%	0.06%	0.28%	1.10%	0.00%	0.02%	0.12%	0.63%	1.74%
	Proposed Total Asset Requirement	0.00%	0.04%	0.25%	1.22%	2.92%	0.00%	0.10%	0.53%	1.92%	3.79%
6.5	Total Current Reserve	0.00%	0.07%	0.27%	0.62%	0.98%	0.00%	0.19%	0.38%	0.74%	1.10%
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.01%	0.04%	0.17%	0.00%	0.00%	0.01%	0.08%	0.39%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.01%	0.04%	0.19%	0.00%	0.00%	0.02%	0.10%	0.44%
	Proposed Total Asset Requirement	0.00%	0.00%	0.05%	0.23%	0.90%	0.00%	0.01%	0.08%	0.46%	1.43%
9.5	Total Current Reserve	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.01%	0.03%	0.12%	0.00%	0.00%	0.01%	0.06%	0.20%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.01%	0.04%	0.14%	0.00%	0.00%	0.02%	0.07%	0.23%
	Proposed Total Asset Requirement	0.00%	0.01%	0.06%	0.20%	0.69%	0.00%	0.02%	0.09%	0.36%	1.11%
	ROLL UP	**-40%**	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
3.5	Total Current Reserve	0.00%	0.00%	0.24%	0.62%	2.27%	0.00%	0.07%	0.36%	1.12%	2.90%
	Total Proposed Reserve - CTE (60)	0.01%	0.05%	0.26%	0.80%	1.99%	0.01%	0.08%	0.37%	1.06%	2.64%
	Total Proposed Reserve - CTE (65)	0.01%	0.06%	0.30%	0.91%	2.27%	0.01%	0.09%	0.42%	1.21%	2.94%
	Proposed Total Asset Requirement	0.04%	0.34%	1.65%	4.81%	9.18%	0.05%	0.48%	2.24%	5.71%	10.18%
6.5	Total Current Reserve	0.00%	0.00%	0.03%	0.33%	0.54%	0.00%	0.00%	0.15%	0.45%	0.65%
	Total Proposed Reserve - CTE (60)	0.00%	0.01%	0.09%	0.34%	0.89%	0.00%	0.03%	0.16%	0.55%	1.34%
	Total Proposed Reserve - CTE (65)	0.00%	0.02%	0.10%	0.39%	1.02%	0.00%	0.03%	0.18%	0.62%	1.54%
	Proposed Total Asset Requirement	0.01%	0.09%	0.56%	2.06%	5.16%	0.02%	0.18%	0.95%	3.32%	6.96%
9.5	Total Current Reserve	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total Proposed Reserve - CTE (60)	0.00%	0.01%	0.08%	0.27%	0.75%	0.01%	0.04%	0.21%	0.67%	1.56%
	Total Proposed Reserve - CTE (65)	0.00%	0.02%	0.09%	0.31%	0.86%	0.01%	0.05%	0.24%	0.76%	1.78%
	Proposed Total Asset Requirement	0.01%	0.08%	0.47%	1.60%	4.39%	0.03%	0.25%	1.22%	3.92%	8.08%
	Max Anniv Value	**-40%**	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
3.5	Total Current Reserve	0.00%	0.00%	0.25%	0.53%	1.74%	0.00%	0.09%	0.36%	0.89%	2.37%
	Total Proposed Reserve - CTE (60)	0.01%	0.01%	0.04%	0.12%	0.45%	0.02%	0.03%	0.08%	0.24%	0.90%
	Total Proposed Reserve - CTE (65)	0.01%	0.02%	0.04%	0.14%	0.52%	0.02%	0.03%	0.10%	0.27%	1.02%
	Proposed Total Asset Requirement	0.06%	0.08%	0.21%	0.68%	2.07%	0.09%	0.17%	0.45%	1.21%	2.90%
6.5	Total Current Reserve	0.00%	0.00%	0.00%	0.27%	0.53%	0.00%	0.00%	0.10%	0.39%	0.65%
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.01%	0.03%	0.10%	0.00%	0.01%	0.01%	0.04%	0.16%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.01%	0.03%	0.11%	0.01%	0.01%	0.01%	0.05%	0.18%
	Proposed Total Asset Requirement	0.02%	0.02%	0.04%	0.15%	0.57%	0.03%	0.04%	0.07%	0.26%	0.90%
9.5	Total Current Reserve	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total Proposed Reserve - CTE (60)	0.01%	0.01%	0.01%	0.03%	0.10%	0.01%	0.01%	0.01%	0.04%	0.14%
	Total Proposed Reserve - CTE (65)	0.01%	0.01%	0.01%	0.03%	0.11%	0.01%	0.01%	0.02%	0.05%	0.16%
	Proposed Total Asset Requirement	0.03%	0.03%	0.05%	0.16%	0.55%	0.05%	0.05%	0.08%	0.24%	0.81%

Note: Total Current Reserve is defined as the Integrated Reserve computed under Actuarial Guideline XXXIV (i.e., the total contract reserves before deducting the Separate Account Reserves), but never less than the cash surrender value on the assumed valuation date.

Proposed Total Asset Requirement is the results at a CTE (90) level, on an after-tax basis, that is being proposed for RBC.

TABLE 1 (continued)
Required Amounts in Excess of Cash Value Expressed as a Percent of Account Value

		Standard Product					Alternate Product				
GMDB-HIGH		**-40%**	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
3.5	Total Current Reserve	0.00%	0.00%	0.20%	0.48%	2.01%	0.00%	0.04%	0.32%	0.91%	2.63%
	Total Proposed Reserve - CTE (60)	0.01%	0.05%	0.24%	0.72%	1.79%	0.02%	0.08%	0.33%	0.95%	2.39%
	Total Proposed Reserve - CTE (65)	0.01%	0.06%	0.27%	0.82%	2.04%	0.02%	0.09%	0.38%	1.08%	2.69%
	Proposed Total Asset Requirement	0.07%	0.34%	1.50%	4.43%	8.70%	0.10%	0.49%	2.05%	5.33%	9.68%
6.5	Total Current Reserve	0.00%	0.00%	0.00%	0.22%	0.48%	0.00%	0.00%	0.05%	0.34%	0.60%
	Total Proposed Reserve - CTE (60)	0.00%	0.01%	0.05%	0.18%	0.54%	0.01%	0.02%	0.09%	0.31%	0.83%
	Total Proposed Reserve - CTE (65)	0.00%	0.01%	0.06%	0.21%	0.61%	0.01%	0.02%	0.10%	0.35%	0.95%
	Proposed Total Asset Requirement	0.02%	0.06%	0.30%	1.11%	3.27%	0.03%	0.11%	0.53%	1.90%	4.82%
9.5	Total Current Reserve	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total Proposed Reserve - CTE (60)	0.01%	0.01%	0.03%	0.12%	0.34%	0.01%	0.02%	0.09%	0.31%	0.81%
	Total Proposed Reserve - CTE (65)	0.01%	0.01%	0.03%	0.14%	0.39%	0.01%	0.02%	0.11%	0.35%	0.92%
	Proposed Total Asset Requirement	0.03%	0.05%	0.18%	0.71%	2.01%	0.05%	0.13%	0.55%	1.81%	4.75%
EDB		**-40%**	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
3.5	Total Current Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.03%	0.17%	0.66%	0.00%	0.00%	0.07%	0.34%	1.24%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.04%	0.19%	0.76%	0.00%	0.00%	0.08%	0.39%	1.37%
	Proposed Total Asset Requirement	0.00%	0.00%	0.17%	0.88%	2.49%	0.00%	0.01%	0.35%	1.52%	3.33%
6.5	Total Current Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.01%	0.03%	0.12%	0.00%	0.00%	0.01%	0.06%	0.24%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.01%	0.03%	0.14%	0.00%	0.00%	0.01%	0.06%	0.27%
	Proposed Total Asset Requirement	0.00%	0.00%	0.04%	0.17%	0.68%	0.00%	0.00%	0.06%	0.32%	1.15%
9.5	Total Current Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total Proposed Reserve - CTE (60)	0.00%	0.00%	0.01%	0.03%	0.10%	0.00%	0.00%	0.01%	0.05%	0.16%
	Total Proposed Reserve - CTE (65)	0.00%	0.00%	0.01%	0.03%	0.11%	0.00%	0.00%	0.01%	0.05%	0.18%
	Proposed Total Asset Requirement	0.00%	0.00%	0.04%	0.16%	0.57%	0.00%	0.00%	0.07%	0.27%	0.89%

Note: Total Current Reserve is defined as the Integrated Reserve computed under Actuarial Guideline XXXIV (i.e., the total contract reserves before deducting the Separate Account Reserves), but never less than the cash surrender value on the assumed valuation date.

Proposed Total Asset Requirement is the results at a CTE (90) level, on an after-tax basis, that is being proposed for RBC.

TABLE 2
Total Proposed Reserve as a Percentage of Total Current Reserve

Standard Product

	CTE (60) as % of Total Current Reserve					CTE (65) as % of Total Current Reserve				
	ITM Percentage					ITM Percentage				
	-40%	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
Return of Premium										
Dur = 3.5	100.00%	99.83%	99.73%	98.97%	98.00%	100.00%	99.83%	99.74%	99.01%	98.12%
Dur = 6.5	100.00%	99.93%	99.74%	99.41%	99.19%	100.00%	99.93%	99.74%	99.42%	99.21%
Dur = 9.5	100.00%	100.00%	100.01%	100.03%	100.12%	100.00%	100.00%	100.01%	100.04%	100.14%
ROLL										
Dur = 3.5	100.01%	100.06%	100.02%	100.19%	99.71%	100.01%	100.06%	100.06%	100.30%	100.00%
Dur = 6.5	100.00%	100.01%	100.06%	100.00%	100.36%	100.00%	100.02%	100.08%	100.05%	100.48%
Dur = 9.5	100.00%	100.01%	100.08%	100.27%	100.75%	100.00%	100.02%	100.09%	100.31%	100.86%
MAV										
Dur = 3.5	100.01%	100.01%	99.79%	99.58%	98.68%	100.01%	100.02%	99.79%	99.60%	98.74%
Dur = 6.5	100.00%	100.00%	100.01%	99.75%	99.57%	100.00%	100.00%	100.01%	99.76%	99.58%
Dur = 9.5	100.01%	100.01%	100.01%	100.03%	100.10%	100.01%	100.01%	100.01%	100.03%	100.11%
HIGH										
Dur = 3.5	100.01%	100.05%	100.04%	100.25%	99.78%	100.01%	100.06%	100.07%	100.36%	100.04%
Dur = 6.5	100.00%	100.01%	100.05%	99.96%	100.06%	100.00%	100.01%	100.06%	99.98%	100.13%
Dur = 9.5	100.01%	100.01%	100.03%	100.12%	100.34%	100.01%	100.01%	100.03%	100.14%	100.39%

Alternate Product

	CTE (60) as % of Total Current Reserve					CTE (65) as % of Total Current Reserve				
	ITM Percentage					ITM Percentage				
	-40%	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
Return of Premium										
Dur = 3.5	99.94%	99.73%	99.58%	98.75%	98.01%	99.94%	99.73%	99.60%	98.83%	98.14%
Dur = 6.5	100.00%	99.81%	99.63%	99.34%	99.30%	100.00%	99.81%	99.63%	99.36%	99.34%
Dur = 9.5	100.00%	100.00%	100.01%	100.06%	100.20%	100.00%	100.00%	100.02%	100.07%	100.23%
ROLL										
Dur = 3.5	100.01%	100.01%	100.01%	99.94%	99.73%	100.01%	100.02%	100.06%	100.09%	100.04%
Dur = 6.5	100.00%	100.03%	100.01%	100.10%	100.69%	100.00%	100.03%	100.03%	100.17%	100.88%
Dur = 9.5	100.01%	100.04%	100.21%	100.67%	101.56%	100.01%	100.05%	100.24%	100.76%	101.78%
MAV										
Dur = 3.5	100.02%	99.94%	99.71%	99.33%	98.50%	100.02%	99.95%	99.72%	99.36%	98.62%
Dur = 6.5	100.00%	100.01%	99.91%	99.65%	99.51%	100.01%	100.01%	99.91%	99.66%	99.54%
Dur = 9.5	100.01%	100.01%	100.01%	100.04%	100.14%	100.01%	100.01%	100.02%	100.05%	100.16%
HIGH										
Dur = 3.5	100.02%	100.04%	100.02%	100.04%	99.75%	100.02%	100.06%	100.07%	100.18%	100.06%
Dur = 6.5	100.01%	100.02%	100.04%	99.97%	100.23%	100.01%	100.02%	100.05%	100.01%	100.35%
Dur = 9.5	100.01%	100.02%	100.09%	100.31%	100.81%	100.01%	100.02%	100.11%	100.35%	100.92%

Note: Total Current Reserve is defined as the Integrated Reserve computed under Actuarial Guideline XXXIV (i.e., the total contract reserves before deducting the Separate Account Reserves), but never less than the cash surrender value on the assumed valuation date.

TABLE 3
Equivalent Percentile for CTE

Standard Product

	CTE (60) = X Percentile					CTE (65) = X Percentile				
	ITM Percentage					ITM Percentage				
	-40%	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
Return of Premium										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
ROLL										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
MAV										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
HIGH										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
EDB										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+

Alternate Product

	CTE (60) = X Percentile					CTE (65) = X Percentile				
	ITM Percentage					ITM Percentage				
	-40%	**-20%**	**0%**	**20%**	**40%**	**-40%**	**-20%**	**0%**	**20%**	**40%**
Return of Premium										
Dur = 3.5	90+	90+	90+	86-90	86-90	90+	90+	90+	86-90	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
ROLL										
Dur = 3.5	90+	90+	90+	86-90	86-90	90+	90+	90+	86-90	86-90
Dur = 6.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 9.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
MAV										
Dur = 3.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
HIGH										
Dur = 3.5	90+	90+	90+	86-90	86-90	90+	90+	90+	86-90	86-90
Dur = 6.5	90+	90+	90+	90+	86-90	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
EDB										
Dur = 3.5	90+	90+	90+	86-90	86-90	90+	90+	90+	90+	86-90
Dur = 6.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+
Dur = 9.5	90+	90+	90+	90+	90+	90+	90+	90+	90+	90+

TABLE 4
Ratio of Proposed Total Asset Requirement (CTE 90 A/T) to Total Current Reserve

	Standard Product					Alternate Product				
Return of Premium	-40%	-20%	0%	20%	40%	-40%	-20%	0%	20%	40%
3.5	100.00%	99.86%	99.95%	99.97%	99.98%	99.94%	99.81%	100.02%	100.16%	100.22%
6.5	100.00%	99.93%	99.78%	99.60%	99.92%	100.00%	99.82%	99.70%	99.72%	100.34%
9.5	100.00%	100.01%	100.06%	100.20%	100.69%	100.00%	100.02%	100.09%	100.36%	101.11%
ROLL UP	-40%	-20%	0%	20%	40%	-40%	-20%	0%	20%	40%
3.5	100.04%	100.35%	101.45%	104.32%	107.05%	100.06%	100.42%	101.94%	104.71%	107.38%
6.5	100.01%	100.09%	100.53%	101.74%	104.64%	100.02%	100.18%	100.81%	102.88%	106.33%
9.5	100.01%	100.08%	100.47%	101.60%	104.39%	100.03%	100.25%	101.22%	103.92%	108.08%
Max Anniv Value	-40%	-20%	0%	20%	40%	-40%	-20%	0%	20%	40%
3.5	100.06%	100.08%	99.96%	100.15%	100.34%	100.09%	100.08%	100.09%	100.33%	100.54%
6.5	100.02%	100.02%	100.04%	99.88%	100.04%	100.03%	100.04%	99.97%	99.87%	100.26%
9.5	100.03%	100.03%	100.05%	100.16%	100.55%	100.05%	100.05%	100.08%	100.24%	100.81%
GMDB-HIGH	-40%	-20%	0%	20%	40%	-40%	-20%	0%	20%	40%
3.5	100.07%	100.35%	101.34%	104.08%	106.85%	100.10%	100.47%	101.78%	104.54%	107.16%
6.5	100.02%	100.06%	100.30%	100.89%	102.80%	100.03%	100.11%	100.48%	101.57%	104.24%
9.5	100.03%	100.05%	100.18%	100.71%	102.01%	100.05%	100.13%	100.55%	101.81%	104.75%

Note: Total Current Reserve is defined as the Integrated Reserve computed under Actuarial Guideline XXXIV (i.e., the total contract reserves before deducting the Separate Account Reserves), but never less than the cash surrender value on the assumed valuation date.