



AMERICAN ACADEMY *of* ACTUARIES

Report of the American Academy of Actuaries' Joint Valuation Work Group

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

June 2002 – Philadelphia, PA

The American Academy of Actuaries is the public policy organization for actuaries practicing in all specialties within the United States. A major purpose of the Academy is to act as the public information organization for the profession. The Academy is non-partisan and assists the public policy process through the presentation of clear and objective actuarial analysis. The Academy regularly prepares testimony for Congress, provides information to federal elected officials, comments on proposed federal regulations, and works closely with state officials on issues related to insurance. The Academy also develops and upholds actuarial standards of conduct, qualification and practice and the Code of Professional Conduct for all actuaries practicing in the United States.

This report was prepared by the Academy's Joint Valuation Work Group, which consists of the Life Capital Adequacy Subcommittee, VAGLB Work Group, and Standard Valuation Law Work Group.

I. Introduction

During its April 25 conference call, the NAIC's Life and Health Actuarial Task Force (LHATF) expressed support for redirecting the Variable Annuities with Guaranteed Living Benefits (VAGLB) reserves project to pursue an approach that incorporates reserves into the proposed Risk-Based Capital (RBC) C-3 Phase II model-based framework. The Academy's Life Practice Council is very interested in pursuing this approach further, since it is consistent with our long-held position that a long-term non-formulaic RBC solution that also addresses reserve considerations for certain products, such as variable products with guaranteed benefits, should be utilized.

For many years, the Life Practice Council has been working somewhat independently with the NAIC Life RBC Working Group and LHATF to develop RBC and reserving solutions for innovative products, such as VAGLBs, Minimum Guaranteed Death Benefits (MGDBs), and Equity Indexed products. Last year, the Life Practice Council reorganized its committees to better support both the short and long term needs to address reserves and RBC on a consistent basis, and to address the concerns with the current statutory valuation framework. In light of the discussion during the April 25 conference call, the Life Practice Council has begun to move forward in earnest on work to develop this long-term solution and would like to report our progress to LHATF.

II. Formation of Academy's Joint Valuation/RBC Work Group

During the past several weeks, the following three distinct work groups of the Life Practice Council have begun working together as a joint group to formulate a long-term solution that addresses both reserves and RBC for variable annuities with VAGLBs:

1. C-3 Work Group - this group is continuing its work with the NAIC Life Risk-Based Capital Working Group in developing an RBC framework for these products. At the same time, this group is looking at ways to use this model-based approach as the basis for the long-term reserve/RBC solution.
2. VAGLB Work Group - this group has redirected its efforts from finalizing Actuarial Guideline (AG) MMMM to providing feedback on potential short-term approaches, based on the current reserve and RBC requirements that may be used until a long-term solution can be implemented.
3. Standard Valuation Law (SVL) Revisions Work Group - this recently formed group is examining various combinations of formulaic and non-formulaic approaches to reserves and RBC for not only variable product guarantees, but also other types of life insurance and annuity contracts. The Life Practice Council views this group as providing the direction to the other Academy work groups as we work with LHATF to develop the long-term solution.

III. June LHATF Meeting Presentation

Given the time constraints at the LHATF meeting, the Joint Valuation Work Group has agreed to limit its discussion to two major topics:

1. Brief RBC C-3 Phase II update on recent progress towards a long-term nonformulaic RBC solution for VAGLBs and MGDBs. This discussion will also address recent issues that have emerged regarding the VAGLB and MGDB reserves to be assumed in the RBC projections.
2. VAGLB Reserves - List of Possible Interim Reserve Solutions

We would recommend that a two-hour session be held at the September LHATF meeting to discuss long-term direction for revisions to the SVL. We believe that this discussion should focus on the Life Practice Council laying out a spectrum of possible options for a new SVL, given the recent RBC nonformulaic direction. While many possible solutions exist along this spectrum, we believe that the major issue for innovative products (such as VAGLBs) should focus on whether simplistic/simplified or formulaic, single scenario-based reserves can be utilized, given the increased emphasis on RBC, or whether reserves should be determined in the same manner as the method used to determine RBC, but at a lower CTE or percentile level. The Life Practice Council would like to supplement this discussion with a list of advantages and disadvantages of the different potential solutions.

IV. RBC C-3 Phase II Update

At the 2002 Spring NAIC meeting, the American Academy of Actuaries' Life Capital Adequacy Subcommittee presented its conceptual recommendation as to the methodology to be used for setting capital adequacy requirements for variable annuity contracts with death or living benefit guarantees. That report is shown in Appendix I. In summary, the suggested approach is to model the company's product portfolio, assets and liabilities, under a variety of economic scenarios and to establish a capital requirement at the CTE(90) level (the average of 90th percentile and all higher percentiles), including the effect of flooring each year's result at the statutory reserve at that point in time under that specific scenario. The goal is to be able to have the new capital requirement in place for year-end 2003.

The March report identified a number of specific issues still being addressed, including running tests of the methodology to understand its implications in practice. The results of our work so far have led us to believe that we are making progress on the issues list, but a new concern is emerging. The preliminary testing to date seems to indicate that the method of flooring each projection year's result against the statutory reserve (AG34 or MMMM) produces total capital requirements that are extremely high and extremely volatile, relative to requirements calculated without such flooring. This seems to result from the AG34 and MMMM reserve requirement that assumes further economic deterioration on a deterministic basis, whereas under stochastic analysis, some future scenarios would follow a path of recovery. This effect appears to be producing total capital requirements that, from the viewpoint of just the assets necessary to mature the obligation, are equivalent to an extremely high CTE level.

The subcommittee is doing further testing in order to understand this effect better and to be better able to illustrate and explain it, but this has become a central concern with the recommendation as it currently stands.

Discussions of the concern regarding high and volatile total required capital have surfaced several methods that might serve to mitigate this effect, including:

- a) Use of a, stable reserve methodology, such as a simple retrospective method. This method would be used to determine reserves actually held by the company and would also be used in the determination of total capital.
- b) Calculation of total capital requirements using an interim reserve floor calculated as in a), even though the actual reserves are determined using a different method.
- c) Calculate total capital requirements using an interim reserve floor equal to cash surrender value, then set reserves actually held by the company at a lower CTE level (for instance, CTE(65)) and RBC at the difference between CTE(90) and the lower CTE level. The lower CTE level would be determined by LHATF. This reserve/RBC approach is more comparable to the basic approach taken by OSFI in Canada. (However, no reserve is incorporated into the program under use in Canada, and thus has no need to use the greatest accumulated loss approach as proposed in Phase II.)
- d) Use an “AVR approach” to RBC requirements. In other words, the current year’s CTE(90) value is taken as the target to move toward over the next few years, not as the current year requirement. (This approach could be combined with any of the above.)

As we complete the testing mentioned above, we should be able to get a better understanding of the impact of these options.

V. VAGLB Reserves-Possible Interim Solutions

A list of possible interim VAGLB reserve solutions is shown in Appendix II.

VI. Summary and Recommendations

In summary, we would recommend the following direction for an interim solution for VAGLB reserves:

- Quickly adopt an interim solution for reserving for VAGLBs to:
 - ◆ Provide desperately needed guidance to both industry actuaries and regulators for 2002 year-end.
 - ◆ Allow resources to be focused on long-term solution.
- Options 1, 3, and 4 (including a MMMM prospective integrated CARVM approach) should not be adopted by LHATF as an interim solution because.
 - ◆ Methods were based upon 1998 LHATF direction, which focused on CARVM and AG33 compliance and ignored RBC considerations.
 - ◆ Four years later, there is less need for such methods, given change in Academy and LHATF focus on prospective based RBC solutions.
 - ◆ The method causes major problems with RBC determination, as documented in Section IV.
 - ◆ Option 4 (three tiered approach) adds additional complexity and inevitable delay in obtaining an interim solution for 2002.
 - ◆ Cost to implement does not justify adopting as only an interim solution.
- Option 5 (a new interim approach) should also not be pursued.
 - ◆ This would require significant time and resources, delay adoption beyond 2002, and divert resources away from long-term solutions.
 - ◆ Unlikely to improve on existing approaches addressed over the past several years.
- Options 2 and 6 (retrospective reserve) should be further discussed by LHATF as an interim solution
 - ◆ The retrospective reserve component is simple, already used by many companies, and will be an easy option to consider in the proposed RBC C-3 Phase 2 framework.
 - ◆ LHATF will need to assess whether the retrospective reserve component is an appropriate interpretation of CARVM. While it is not a prospective based method, the RBC C-3 Phase 2 methodology will be, and is minimally compromised/affected by this simple reserve standard.
 - ◆ LHATF needs to determine whether it is appropriate to add an additional asset adequacy analysis requirement for Option 6. This may require significant time and resources, and may delay adoption beyond 2002. In addition, the Academy Life Practice Council believes asset adequacy should be focused on a company level, rather than at a benefit level.
- Life Practice Council and LHATF should plan for increased future discussions on long-term RBC and reserve solutions. As mentioned, we recommend that dedicated sessions on this topic be established at future LHATF meetings.

APPENDIX I



AMERICAN ACADEMY *of* ACTUARIES

Recommended Approach for Setting Regulatory Risk-Based Capital Requirements for Variable Products with Guarantees (Excluding Index Guarantees)

Presented by the American Academy of Actuaries' Life Capital Adequacy Subcommittee to the National Association of Insurance Commissioners' Life Risk-Based Capital Working Group

Reno, NV – March 2002

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Background:

Several years ago, the NAIC Life Risk Based Capital Working Group asked the American Academy of Actuaries to take a fresh look at the C-3 component of the RBC formula to see if a practical method could be found to reflect the degree of asset/liability mismatch risk of a particular company.

We reviewed the request and agreed that more sensitivity to the specifics of product design and funding strategy is appropriate to advance the goal of differentiating weakly capitalized companies from the rest. We have defined C-3 risk to include Asset/Liability risk in general, not just interest rate risk.

Effective December 31, 2000, the NAIC implemented Phase 1 of this project. Phase 1 addressed interest rate risk for annuities and single premium life. For Phase 1, “annuities” means products with the characteristics of deferred and immediate annuities, structured settlements, guaranteed separate accounts, and GICs (including synthetic GICs, and funding agreements). Equity based variable products were not included in Phase I, but products that guarantee an interest rate index and variable annuities sold as fixed were, if they were cash flow tested. Phase 1 of the project implemented the determination of capital requirements for interest sensitive products by scenario testing (October 1999 report; available at: www.actuary.org).

The American Academy of Actuaries’ Life Capital Adequacy Subcommittee recommends implementing Phase 2 to address both the interest rate and equity risk associated with variable products with guarantees (including living, death benefit and secondary guarantees), other than index guarantees.

Recommendation:

The recommended approach is to run stochastic scenarios using prudent best estimate assumptions (the more reliable the underlying data is, the closer the assumptions will be to experience and vice versa) and calibrated fund performance distribution functions on an aggregated basis. The measure of required capital for each scenario is consistent with the metric used in C-3 Phase I: under each scenario, starting with no statutory surplus, the year by year accumulated statutory surplus is calculated, reflecting estimated statutory reserves, Federal Income Tax, and expenses. As directed under Phase 1, these stochastic determinations of capital requirements also must be adjusted to avoid double counting of risks or revenue that are reflected elsewhere in the RBC calculations or their factor development. For each scenario, accumulated statutory surplus is determined for each calendar year-end and its present value calculated. The lowest of these present values is then tabulated. The scenarios are then sorted on this measure. Unlike the Phase I project, we are favoring the approach introduced in the Canadian Institute of Actuaries (“CIA”) work and recommending the use of a modified Conditional Tail Expectation (“CTE”) 90 percent to set RBC requirements. (“Segregated Fund Guarantees” is available at www.actuaries.ca.) Modified CTE 90 is the arithmetic average of the worst 10 percent of all scenarios, with no scenario being calculated as a positive value of accumulated surplus. The CTE 90 estimated surplus requirement less the reserves set up for these benefits establishes the RBC amount required.

It is also recommended that this RBC amount should be combined with the $C1_{CS}$ factor for covariance purposes .

The way grouping (of funds and of contracts), sampling, number of scenarios, and simplification methods are handled is the responsibility of the actuary. However, all these methods are subject to Actuarial Standards of Practice (ASOP), supporting documentation and justification. Actuarial certification will be required. A material change in model (or assumptions), from that used previously, will require regulatory disclosure and may be subject to regulatory review and approval.

Glossary:

Gross Wealth Ratio – The gross wealth ratio is the cumulative return for the indicated time period and percentile. (e.g., 1.0 indicates that the index is at its original level.)

Guaranteed Minimum Income Benefit (GMIB) – The 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.

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 end 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.

For non-scenario tested assumptions (those which do not vary over the stochastic scenarios), a "prudent best estimate" assumption would normally be defined by applying a margin for adverse deviation to the "best estimate" assumption. "Best estimate" would typically be the actuary's most reasonable estimate of future experience for a risk factor given all available, relevant information pertaining to the contingencies being valued. Recognizing that assumptions are simply assertions of future unknown experience, the margin for adverse deviation should be directly related to uncertainty in the underlying risk factor. The greater the uncertainty, the larger the margin. Each margin should serve to increase the liability or provision that would otherwise be held in its absence (i.e., using only the best estimate assumption).

For example, assumptions for circumstances that have never been observed require more margin for error than those for which abundant and relevant experience data are available. Furthermore, larger margins are typically required for contingencies related to policyholder behavior when a given policyholder action results in the surrender or exercise of a valuable option.

Variable Annuity Guaranteed Living Benefit (VAGLB) – VAGLB is a guaranteed benefit included in a variable deferred or immediate annuity 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 fall 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 that exceed the Projected Contract Value are included in this definition.

Scope:

All variable annuities that contain any guaranteed death or living benefit and variable life insurance with secondary guarantees, whether written directly or assumed through reinsurance, must utilize scenario testing to establish capital requirements. (Equity indexed products are excluded from this requirement. Separate account products that guarantee an index are covered in another recommendation from the Academy and being considered for adoption by the NAIC.)

Scenarios:

Scenarios will consist of a sufficient number of interest rate and equity scenarios, adequate for the purpose, created by the company. The interest rate and equity scenarios will need to meet the calibration methodology and requirements outlined in Appendix 2.

Methodology:

Asset/Liability models should be run that reflect the dynamics of the guarantees provided and the statutory accounting framework currently in place.

Assets:

The statement value of assets included in the model should be set equal to the statement value of reserves modeled. The reserves should be net of amounts accrued for expense allowances reported in page 3, line 13A of the annual statement (i.e., CARVM/CRVM allowance). The mix of assets between separate account and general account assets should be consistent with that used for cash flow testing.

Interim Reserves:

Interim reserves need to be reasonably estimated throughout the projection period. For further guidance see Methodology Note C3-02.

Fund categorization:

The funds offered on the product may be grouped for modeling. In Methodology Note C3-01, various current practices are provided. Regardless of method chosen, fundamental characteristics of the fund should be made in relation to the required calibration points of the S&P 500 and Ibbotson Small Cap Index. The modeling should reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk.).

Modeling of Hedges:

If the insurer is following a clearly defined hedging strategy, the stochastic model should take into account the impact of hedge positions currently held and expected to be held in the future. (To the degree the hedge position includes basis, gap or price risk, some reduction for effectiveness of hedges may be made.)

Capital Determination:

A conditional tail expectation approach will be used to determine required capital. The CTE at the 90th percentile will be the standard. This reflects the results in the worst 10 percent of all scenarios. However, for capital determination, we will cap the results of any one scenario at 0 (i.e., no gains are allowed to offset the losses in the tail).

C1 Expense Allowance Elimination for Modeled Products

The current RBC formula has a charge for the expense allowance in reserves of 2.4 percent (pre-tax) if the surrender charges are based on fund contributions and the fund balance exceeds the sum of premium less withdrawals; otherwise the charge is 11 percent. This amount provides for the possible non-recovery of the full "CARVM Allowance" if the stock market performs poorly. Since this impact will be captured directly in the Phase 2 modeling, this separate requirement is no longer necessary for products covered by C3, Phase 2.

Alternative Method:

[This section is illustrative of the sort of "safe harbor" we are trying to find. It is not a part of the recommendation at this time.]

As an alternative to stochastic scenario testing, a company may choose to use the "Alternative Method" for some or all of its eligible products. Under this method, capital requirements are calculated for three scenarios. These scenarios are consistent with the Determination of Keel Method Scenarios for reserve requirements under Actuarial Guideline MMMM. However, N, will be based on the percentile of the cumulative distribution at 1 percent, 5 percent and 10 percent, and equal -2.326, -1.645 and -1.281, respectively. (For reserves, N is set equal to -0.9674 for the 16.67 percentile.) The arithmetic average of these three results is the total capital requirement for these products. In doing these calculations, no lapses are to be assumed and no interim surplus strains to be considered. The risk based capital requirement is the excess of any of the initial assets needed to mature the obligation above the reserve, but not less than zero. Eligible products are minimum death benefit guarantee products and living benefit products eligible for the "keel method" under Actuarial Guideline MMMM. "Enhanced death benefit" products and path dependent living benefits are not eligible for the alternative method.

Actuarial Memorandum:

An actuarial memorandum should be constructed documenting the methodology and assumptions upon which the required capital is determined. The memorandum should also include sensitivity tests that the actuary feels appropriate given the composition of their block of business (i.e. identifying the key assumptions, that is those that contribute most to the RBC amount and if changed have the largest effect on RBC for the product). This memorandum will be confidential and available to regulators upon request.

Regulatory Communication:

If there is a material change in results due to a change in assumptions from the previous year, an executive summary should be sent to the state of domicile communicating such change and quantifying the impact it has on the results. Such communication shall remain confidential.

Appendix 1 – General Methodology

For “Guaranteed Minimum Income Benefits”, the risk to expected margins in the purchase rate from uncertain future interest rates will be reflected in the modeling. An equity fund’s degree of volatility will be reflected in the modeling. Reinsurance and hedging will also be reflected. For hedging, an adjustment to the modeled result may be made (reflecting basis risk, gap risk, and cost risk, if any).

For each scenario, the C3 measure is the most negative of the series of present values $S(t)*pv(t)$, where $S(t)$ is statutory assets less statutory liabilities for the products in question at the end of year t and $pv(t)$ is the accumulated discount factor for t years using 105 percent of the after-tax one-year Treasury rates for that scenario. {This needs more discussion and confirmation what rate should be used for discounting.}

Appendix 2 - Model Calibration

Interest rate scenarios generated must have a distribution of value that meet or exceed the following calibration criteria such that the number of scenarios generated produce rates less than or greater than the rates in the tail.

1 Year Treasury Rates

<u>Accumulation Period</u>	<u>2.5%-ile</u>	<u>5%-ile</u>	<u>10%-ile</u>	<u>90%-ile</u>	<u>95%-ile</u>	<u>97.5%ile</u>
One-year						
Five-year						
Ten-year						

10 Year Treasury Rates

<u>Accumulation Period</u>	<u>2.5%-ile</u>	<u>5%-ile</u>	<u>10%-ile</u>	<u>90%-ile</u>	<u>95%-ile</u>	<u>97.5%ile</u>
One-year						
Five-year						
Ten-year						

Equity scenarios need to be generated for model calibration. These scenarios should be generated for the S&P 500 and Ibbotson Small Cap indexes. This ensures that the equity generator used produces results comparable to what has been historically observed. These generated scenarios may or may not be used in the projection. [The values shown here are still under review]

S&P 500 Gross Wealth Ratios

<u>Accumulation Period</u>	<u>2.5%-ile</u>	<u>5%-ile</u>	<u>10%-ile</u>	<u>90%-ile</u>	<u>95%-ile</u>	<u>97.5%ile</u>
One-year	0.86	0.89	0.94	1.35	1.39	1.44
Five-year	1.02	1.10	1.23	2.72	2.96	3.20
Ten-year	1.36	1.43	1.57	5.04	5.36	5.58

Ibbotson Small Cap Gross Wealth Ratios

<u>Accumulation Period</u>	<u>2.5%-ile</u>	<u>5%-ile</u>	<u>10%-ile</u>	<u>90%-ile</u>	<u>95%-ile</u>	<u>97.5%ile</u>
One-year	0.73	0.80	0.89	1.45	1.57	1.69

Five-year	0.65	1.03	1.20		3.50	3.97	4.28
Ten-year	1.65	1.80	2.05		8.51	10.29	11.38

Methodology Note C3-01 – Equity Fund Categorization

In many instances, it is not practical to run scenarios based on each individual fund. Therefore some grouping of funds may be made. Examples of classification groups used in the industry include:

- Portfolio Objective
- Morningstar classification
- Fund Concentration (e.g. Industry Funds)
- Historical Returns
- Performance Benchmark
- Beta
- AG 34 Classifications

Methodology Note C3-02 – Interim Reserves

As in all modeling, significant assumptions are frequently used. However, it is the responsibility of the actuary to ensure that the model reasonably reflect anticipated experience. Because of the importance of statutory reserves in the determination of the lowest future present value, care should be used. It is generally unrealistic to perform stochastic projection for reserves within a stochastic projection for capital determination. Therefore, reasonable estimates may need to be made. One such example is for guaranteed minimum income benefits (“GMIB’s”). Reserves may be highly dependent on product design, the relationship of the account value and the notional GMIB value, and the duration of the contract. One approach to reflect this is to adjust the calculated reserve based on a table that summarizes the relationship between these characteristics.

Methodology Note C3-03 – Model Building for In Force Liabilities

In Force Liabilities need to be constructed utilizing a method that adequately represents the risks of the underlying contracts. If liabilities are summarized, the risk characteristics of the group should be representative of the individual policies and properly represent the different fund characteristics and strategies of the individual contract. For Variable contracts some examples include:

- Fund concentrations
- Average Beta of policy
- Average Risk & Return expected

- Morningstar Categories
-

Methodology Note C3-04 – Allocations of Funding and Other Behavioral Characteristics
[Content to Follow]

Future Issues to be Resolved:

- Calibration requirements for interest rates and equity returns;
- Testing Alternative Method
- Details of Regulatory review and approval
- Does scope include VUL
- What credit should be allowed for hedging
- Testing methodology and results
- Discount rates for accumulated negative surplus

APPENDIX II

VAGLB Interim Reserve Options

Reserve Approach	RBC Approach	Pros / Cons
<p>1. Prospective AG MMMM (without retrospective minimum floor)</p> <ul style="list-style-type: none"> - Integrated, prospective CARVM approach 	<p>a. Current interim RBC requirement</p> <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based <p>b. Revised RBC</p> <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Already developed and ready for immediate adoption. • Consistent with current integrated CARVM framework (AG 33 & 34). • Reflects historical return levels and actual net amount at risk. • Stochastic scenario reserve development and scenario calibration requirements represent significant steps forward in U.S. valuation requirements. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Complexity of implementation justified only as a long-term solution. • Very volatile -- increase in reserve may exceed total contract revenue in any given calendar year. • To the extent the proposed RBC C-3 Phase II calculation incorporates projection of reserve increases, this reserve approach will add a great deal of complexity to the calculation and volatility to the results.
<p>2. Retrospective accumulation of fees, with or without a release mechanism.</p> <ul style="list-style-type: none"> - no prospective component - not integrated with CARVM 	<p>a. Current interim RBC requirement</p> <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based <p>b. Revised RBC</p> <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Simple to implement (good characteristic for an interim approach). • Consistent with approach used by most companies for the past two year-ends. • May work well with proposed RBC C-3 Phase II framework. • May work well with RBC and reserve long-term direction alternatives that contain simpler formulaic reserve approaches. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Doesn't reflect actual net amount at risk, specific benefit profile, and variations by fund class. • Produces counterintuitive results -- reserves are lower when the VAGLB charges are smaller, and under-priced VAGLB's have lower reserves than more conservatively priced VAGLBs. • May not work well with RBC and reserve long-term direction alternatives that contain more company-specific non-formulaic reserve approaches. • Lack of release mechanism beyond the short-term may result in redundant reserves. • Inconsistent with current integrated CARVM framework (AG 33 & 34). • LHATF would need to determine whether this approach is consistent with SVL and CARVM.

VAGLB Interim Reserve Options (cont.)

Reserve Approach	RBC Approach	Pros / Cons
<p>3. Greater of 1. And 2. (current NAIC Draft Guideline MMMM)</p> <p>- Combination of:</p> <ol style="list-style-type: none"> 1) Integrated prospective component; and 2) non-integrated retrospective component 	<ol style="list-style-type: none"> a. Current interim RBC requirement <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based b. Revised RBC <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Same pros as listed in #1 above. • In addition, addresses concerns of some regulators that a company could, under certain scenarios, have a significant increase in reserves after having released a portion of the charges for VAGLBs into earnings for several years. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Same cons as listed in #1 above. • Retrospective floor added only as an interim solution (i.e., no release mechanism).
<p>4. Greater of 3 and NY/CT 3 percent approach (NY 2/15/02 document)</p> <p>- Combination of three-tiers:</p> <ol style="list-style-type: none"> 1) Integrated prospective component; 2) Non-integrated retrospective component; and 3) Non-integrated prospective component 	<ol style="list-style-type: none"> a. Current interim RBC requirement <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based b. Revised RBC <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • First reserve tier consistent with current integrated CARVM framework (AG 33 & 34). • First reserve tier reflects historical return levels and actual net amount at risk. • Stochastic scenario reserve development and scenario calibration requirements in first reserve tier represent significant steps forward in U.S. valuation requirements. • Second and third reserve tiers address concerns of certain regulators. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Same cons as listed in #3 above. • Additional cons raised by Academy VAGLB Work Group during April 25 meeting (i.e., ignores VAGLB fees and underlying fund characteristics, need to perform additional analysis and testing, additional complexity of a three-tiered approach, impact on contracts with multiple benefits, etc.).

VAGLB Interim Reserve Options (cont.)

Reserve Approach	RBC Approach	Pros / Cons
<p>5. New interim approach (yet to be developed)</p> <ul style="list-style-type: none"> - e.g., Keeel-only prospective approach. 	<p>a. Current interim RBC requirement</p> <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based <p>b. Revised RBC</p> <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Potential for an approach that is custom-made for the short-term and the proposed C-3 Phase 2 framework. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Unlikely to improve upon existing approaches, since it is likely that all issues and concerns have already been discussed over the past years, analyzed and acted upon. • Development would take significant time and resources away from the long-term solution by focusing on an approach which is only an interim solution. • Time delay would likely delay adoption of desperately needed guidance to industry actuaries and regulators.
<p>6. Retrospective accumulation of fees, with or without a release mechanism, with an additional standalone Adequacy Analysis requirement</p> <ul style="list-style-type: none"> - no prospective component - not integrated with CARVM 	<p>a. Current interim RBC requirement</p> <ul style="list-style-type: none"> - expected to be in place through 2002 - no direct recognition of reserves - simple, factor based <p>b. Revised RBC</p> <ul style="list-style-type: none"> - expected as early as 12/2003 - non-formulaic - direct recognition of reserves 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Same pros as listed in #2 above. • Additional standalone asset adequacy analysis could create a mechanism for determining whether the accumulation of fees provides an adequate reserve. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Same cons as listed in #2 above. • Additional asset adequacy analysis requirement is inconsistent with the current AOMR framework, and Academy direction, that addresses the total company reserves in aggregate. • Addressing VAGLB risks in isolation would not capture the interaction of VAGLB risks with other company risks (e.g., ignores risk diversification). • Development would take significant time and resources away from the long-term solution by focusing on an approach which is only an interim solution.