AMERICAN ACADEMY of ACTUARIES

Report of the American Academy of Actuaries' Life Capital Work Group

Presented to the National Association of Insurance Commissioners'
Life Risk Based Capital Work Group

New York. NY – March 2007~~**San Antonio. TX – December 2006**~~

The American Academy of Actuaries is a national organization formed in 1965 to bring together, in a single entity, actuaries of all specializations within the United States. A major purpose of the Academy is to act as a public information organization for the profession. Academy committees, task forces and work groups regularly prepare testimony and provide information to Congress and senior federal policy-makers, comment on proposed federal and state regulations, and work closely with the National Association of Insurance Commissioners and state officials on issues related to insurance, pensions and other forms of risk financing. The Academy establishes qualification standards for the actuarial profession in the United States and supports two independent boards. The Actuarial Standards Board promulgates standards of practice for the profession, and the Actuarial Board for Counseling and Discipline helps to ensure high standards of professional conduct are met. The Academy also supports the Joint Committee for the Code of Professional Conduct, which develops standards of conduct for the U.S. actuarial profession.

Life Capital Work Group

Peter Boyko, F.S.A., F.C.I.A., M.A.A.A., Chair

Nancy Bennett, F.S.A., M.A.A.A.
Robert Bingham, F.S.A., M.A.A.A
Bruce Bohlman, F.S.A., M.A.A.A.
~~Susan Christy~~
Martin Claire, F.S.A., M.A.A.A.
Arnold Dicke, F.S.A., M.A.A.A.
Alan Elstein, F.S.A., M.A.A.A.
Barbara Lautzenheiser, F.S.A., M.A.A.A.
Shawn Loftus, F.S.A., M.A.A.
Dwayne McGraw, F.S.A., M.A.A.A
Craig Morrow F.S.A., M.A.A.A.
Dave Neve, F.S.A., M.A.A.A.
Stuart Silverman, F.S.A., M.A.A.A.
Kenneth Vande Vrede, F.S.A., M.A.A.A

The LCWG would also like to acknowledge the work of Susan Christy.

Certain Changes from December 2006 Draft

(1). Background (Section 1) reorganized for better clarity with respect to what is being recommended.
(2). Best Estimate now termed Anticipated Experience to be consistent with all other American Academy of Actuaries Principles-Based Approach projects.
(3). Prudent Best Estimate now termed Prudent Estimate to be consistent with all other American Academy of Actuaries Principles-Based Approach projects.
(4). Renamed "Asset Segment" to "Business Segment" so as not to be confused with companies' segments resulting from segmentation.
(5). Renamed "Exclusion Amount" to "Alternative Amount." Exclusion Amount implies that policies in that category are somehow excluded or exempt from the capital requirements, which is untrue.
(6). Principles (Section 4) revised to be a discussion of General Concepts.
(7). Reordered 6G and GH so discussion of Stochastic Amount (primary method) precedes Alternative Amount (secondary method).

List of Issues:

(1). CTE90 – Reserve vs. CTE90 – CTE65
(2). Inclusion of income taxes in the calculation - this produces significant clutter in the calculations. Would results be meaningful and acceptable if taxes were excluded from the calculations.
(3). Prescribed spread to Treasuries on reinvestments – amount / method outstanding.
(4). Discount rates
(5). Guidance for setting Prudent Estimate assumptions
(6). Working Reserve: use of CSV vs. PVCF
(7). Allocation of amount between C3a and C3c.
(8). Demonstration requirements for Alternative Amount.
(9). Review of Reinsurance Issues
(10). Electronic filing requirement for use of YE data.
(11). The March 2007 documents submitted by the Life Reserves Working Group (LRWG) to the NAIC contain changes from the December 2006 proposal. The Life Capital Work Group has not yet reviewed or considered these changes and their possible applicability to our project. Specific changes that need to be reviewed include:
   a. the equivalent of Section 7 – Modeling of Hedges has been modified in the LRWG Requirements.
   b. LRWG Requirements include a new concept - "Provision for Model Understatement"
   c. LRWG Requirements include language that deals with derivative instruments used for non-hedging purposes (income generation and replication transactions).

Table of Contents

Section 1. Background

Section 2. Purpose

Section 3. Scope

Section 4. ~~Guiding Principles~~General Concepts

Section 5. Definitions

Section 6. Definition of General Methodology

Section 7. Guidance and Requirements for Modeling of Hedges

Section 8. Guidance and Requirements for Reflecting Revenue Sharing Assumptions

Section 9. Certification and Documentation Requirements

Section 1. Background

The Life Capital Work Group (LCWG) was formed in October 2005 as a work group of the American Academy of Actuaries' Life Capital Adequacy Subcommittee (LCAS), drawing resources from LCAS and the Life Reserves Work Group (LRWG). Its original charge ~~is~~ was to review and evaluate the interest rate and market risk (C3) component of the current Life Risk-Based Capital framework in the context of life products valued under a principles-based reserving approach. The LCWG will work with the LRWG and the LCAS and will recommend changes to the Life-Risk Based Capital formula, as necessary, for consideration by the NAIC's Capital Adequacy Task Force.

Over time, the charge of the LCWG evolved to fit the developing solution. As a result, the project was expanded to include the market risk portion of Asset Risk (C1) and all inforce business.

The scope of the work does not include a review of the other existing C-risk ~~1 or C2~~ components. ~~The intent is to require the recommended approach apply to all Life Insurance products, not just those products using principles based reserves.~~

This report summarizes the work of the LCWG to date by outlining the recommended approach and providing detail on how the amounts necessary should be calculated.

~~Since the data to be used for the development of these capital requirements is not available to us, we have made no attempt to quantify the overall impact of these requirements. We suggest revisiting all aspects of this methodology: assumption setting, regulatory issues, hedge evaluation, standards, results in practice, areas in need of clarification, etc, after two years of regulatory filings. This Work Group would be glad to assist in that review.~~

Recommended Approach

The approach to calculating the RBC requirements for the risks noted above can be summarized by the following 4 steps. For the most part, these methods have been determined in a way that is consistent with what is currently being done for C3 Phase II.

~~—~~(1). Project asset and liability cashflows over a series of stochastically generated interest rate and / or equity return scenarios where asset and liability cashflows are projected using Prudent ~~Best~~ Estimate Assumptions. ~~(the more reliable the underlying data is, the smaller the need for Margins for conservatism).~~

~~—~~(2). Calculate required C3 capital for each scenario. First determine ~~similar to the method used in C-3 Phase II for each scenario,~~ accumulated statutory surplus for each projected calendar year end and calculate its present value ~~calculated~~. The lowest of these present values is the C3 capital need for that scenario. ~~tabulated and the scenarios are then sorted on this measure.~~ For this purpose, statutory surplus is modeled as if the statutory reserve was equal to the Working Reserve.

(3). Determine the CTE 90 value based on all the scenarios. The CTE 90 value is the average of the lowest 10% of the scenario results.

(4). The C3 Risk-Based Capital need is calculated as the excess of the CTE 90 Total Asset Requirement (TAR) above the reserve, with an adjustment for differences between tax reserves and statutory reserves on the starting date.

~~Consistent with C3 Phase II a Conditional Tail Expectation (CTE) risk measure is used to set Total Asset Requirements (TAR). Risk-Based Capital is calculated as the excess of the CTE 90 Total Asset Requirement above the statutory reserves with an adjustment for differences between tax reserves and statutory reserves. CTE 90 is the recommended risk level, consistent with C3 Phase II. However, the NAIC's Capital Adequacy Task Force will make the determination of the CTE level.~~

~~—~~This C3 RBC amount relates to Interest Rate Risk and / or Equity/Market Risk. That portion which is attributable to Interest Rate Risk is to be combined with the current C3a component of the formula. That portion which is attributable to Equity/Market Risk is to be allocated and combined with the current C3c component of the formula.

This method of calculation has an impact on other aspects of the RBC calculation. Specifically:

- C1 Expense Allowance Elimination for Covered 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 "CRVM Allowance", if the stock market performs poorly. Since this impact will be captured directly in the stochastic modeling, or implicitly in the ~~Exclusion~~ Alternative Amount, this separate requirement is no longer necessary for products covered by this report.

- C1cs (Is this intentional?) Elimination for supporting Equity Assets. The development of the C3 amount in the recommended approach includes an amount in respect to the market volatility of equity assets backing the reserves on the products in scope. To avoid a double-counting of this amount in the RBC formula it is recommended that the value of the equities backing the reserves on the products in scope be removed from the equity exposure amount in the existing C1cs component.

- In this report, the LCWG recommends that Single Premium Life (why is this capitalized if it is not defined) products be included in the scope of products covered by this report. Currently, C3 on such products is covered by C3 Phase I

~~Timing of Calculations.~~ In order to allow time for the work required to develop the capital requirements, we recommend that an estimated value, based on a date preceding year-end, be ~~is~~ permitted for the year-end annual statement. Then, at the time of ~~For~~ the electronic filing (filing where?) of ~~r~~Risk-B~~b~~ased Ceapital, the company would recalculate the RBC value using year-end data. ~~the reported Authorized Control Level Risk-Based Capital should be no less than the amount required, using year-end data but not necessarily requiring a complete recalculation as of year-end using the NAIC Instructions which include this methodology for Variable Annuities and Similar Products~~. If the reported Authorized Control Level Risk-Based Capital for ~~a~~ the company exceeds that printed in the annual statement by more than 5 percent, or if the reported Risk-Based Capital triggers regulatory action, a revised filing of the annual statement with the reported results ~~is required to~~will be made to the NAIC and the state of domicile by June 15. (Why then are all subject to fiscal YR)~~:~~ ~~o~~Otherwise re-filing is permitted but not required.

~~It is~~We also recommend that the Enhanced C-3 Phase I Interest Rate Generator should be used in generating any interest rate scenarios or regenerating pre-packaged fund scenarios for funds that include the impact of bond yields. Details concerning the Enhanced C-3 Phase I Interest Rate Generator can be found on the American Academy of Actuaries website at the following address http://www.actuary.org/pdf/life/c3supp_jan06.pdf. Note that the enhanced generator allows the use of a user-defined yield curve. It is recommended that the user-defined yield curve be that in effect as of the date of valuation, rather than any prior "as-of" date being used in the modeling.

~~The LCWG believes Actuarial Standard of Practice No.7 (ASOP 7) applies to the recommended requirements since it involves cash flow testing. Any conflict between ASOP 7 and the statutory requirements should be disclosed in the documentation. Specifically, such disclosure should make it clear that the analysis was performed in accordance with the requirements of the applicable statutory requirements.~~

~~—~~Guidance regarding the determination of ~~p~~Prudent ~~best e~~Estimates underlying the calculations is under development. ~~Further discussion is needed as to the breadth and form the recommended guidance should take.~~ The breadth and form of this determination needs further discussion.

Since the data to be used for the development of these capital requirements is not available to us, we have made no attempt to quantify the overall impact of these requirements. We suggest revisiting all aspects of this methodology: assumption setting, regulatory issues, hedge evaluation, standards, results in practice, areas in need of clarification, etc., after two years of regulatory filings. This Work Group would be glad to assist in ~~that~~ such review.

Section 2. Purpose

A. The purpose of this report is to recommend a principles-based approach to the determination of the C3 component and a portion of the C1 component of Risk-Based Capital for individual life products, including individually underwritten life certificates.

B. A principles-based approach is one that:

1. Captures all of the identifiable, quantifiable and material risks, benefits and guarantees associated with the contracts including Material Tail Risk and the funding of the risks.
2. Utilizes risk analysis and risk management techniques to quantify the risks and is guided by the evolving practice and expanding knowledge in the measurement and management of risk. This may include, to the extent required by an appropriate assessment of the underlying risks, stochastic models or other means of analysis that properly reflect the risks of the underlying contracts.
3. Incorporates assumptions and methods that are consistent with, but not necessarily identical to, those utilized within the company's overall risk assessment process. Company risk assessment processes include but are not limited to experience analysis, asset adequacy testing, GAAP valuation and pricing.
4. Permits the use of company experience, based on the availability of relevant company experience and its degree of credibility, to establish assumptions for risks over which the company has some degree of control or influence.
5. Provides for the use of assumptions, set on a ~~p~~Prudent ~~best e~~Estimate basis, that contain an appropriate level of conservatism when viewed in the aggregate and that, together with the methods utilized, recognizes the solvency objective of statutory Risk Based Capital.

Section 3. Scope

A. The method defined by this report applies to all individual life insurance policies whether directly written or assumed through reinsurance, including:

1. Universal life insurance policies;
2. Variable life and variable universal life insurance policies;
3. Term life insurance policies;
4. Traditional whole life insurance policies;
5. Indexed life and indexed universal life insurance policies;
6. Individual life policies and individually underwritten certificates issued under a group life insurance contract; and
7. Combination policies that include other benefits such as annuity benefits or long-term care benefits in addition to life insurance benefits, but are filed as individual life insurance policies.

B. Risk-Based Capital requirements for individual life policies, supplemental benefits, and riders on those policies that are not directly identified in this report are to be determined on a basis that is consistent with the principles and methodologies defined in this report.

Section 4. General Concepts~~Guiding Principles~~

The LCWG had a number of ~~thoughts in mind~~ideas when these (which?) recommendations were developed. Understanding these concepts will help in understanding the method.

Our intention was to provide a framework that can be applied to in-scope life insurance (and possibly extended to annuity products ~~some time~~ in the future). As a result, the method has to be broad enough~~,~~ and general enough~~,~~ to cover the broad range of products.

The C3 RBC amount to be calculated should be based on a prospective valuation method that appropriately captures all material C3 risks underlying the product being valued, the revenue to fund those risks, and the effect of any risk mitigation techniques.

While the method contemplates a stochastic approach to the determination of appropriate values, a deterministic approach may be sufficient for certain products, depending on the nature of the risks. A stochastic approach may be necessary for other products.

For risks over which the company has some degree of control over (e.g., mortality), assumptions should reflect a blend of company experience and prescribed assumptions (or methods for setting the assumptions), with the relative weightings of each dependent on the credibility of company experience. For risks over which the company has no control (e.g., market interest rate movements), assumptions should be determined in a way such that all companies use the same assumptions. This may require prescribed assumptions or methods for setting those assumptions.

The only assumptions for which stochastic processes were considered are those for interest rates and equity returns. All other assumptions should incorporate appropriate margins for uncertainty. These margins should be consistent with those that would be appropriate for reserves.

Assumptions should be updated as experience data emerges and expectations of future experience and economic conditions change. In other words, assumptions are not locked in at issue.

Finally, we recognize that while ~~The method defined by this report is based on the following set of principles. These principles should be followed when applying the methodology defined by this report and analyzing the resulting amounts. The principles should be considered in their entirety.~~

~~**Principle 1:** The amount is based on a prospective valuation method that appropriately captures all material risks underlying the product being valued, including the magnitude of Material Tail Risk, the revenue to fund the risks, and the effect of any risk mitigation techniques.~~

~~**Principle 2:** The method provides a framework that can be applied to all individual life insurance products.~~

~~**Principle 3:** A deterministic approach may be sufficient for certain products, depending on the nature of the risks, and a stochastic approach may be necessary for other products.~~

~~**Principle 4:** For risks that the company has some degree of control over (e.g., mortality), assumptions should reflect a blend of company experience and prescribed assumptions (or methods for setting the assumptions), with the relative weightings of each dependent on the credibility of company experience. For risks that the company has no control over (e.g., market interest rate movements), prescribed assumptions or methods for setting the assumption should be used.~~

~~**Principle 5:** Assumptions that are not stochastically modeled should incorporate appropriate Margins for uncertainty. In the case of C3 RBC, the assumptions for items other than interest rates and equity performance should be consistent with those used in establishing reserves.~~

~~**Principle 6:** Assumptions are not locked in at issue, but are updated as expectations of future experience and economic conditions change.~~

~~**Principle 7:** While~~ a stochastic cash flow model attempts to include all real world risks relevant to the objective of the stochastic cash flow model and relationships among the risks, it will still contain limitations because it is only a model. Neither a cash flow scenario model, nor a method based on factors calibrated to the results of a cash flow scenario model, can completely quantify a company's exposure to risk. A model attempts to represent reality, but will always remain an approximation thereto and hence uncertainty in future experience is an important consideration when determining the amount being valued. As such:

1. The actuary must take the model's limitations into consideration when setting assumptions, applying the methodology and determining the appropriateness of the resulting amounts.
2. The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit 'foreknowledge' of the components of the required methodology. Therefore, the use of assumptions, methods, models, risk management strategies (e.g., hedging), derivative instruments, structured investments or any other risk transfer arrangements (such as reinsurance) that serve to materially reduce the calculated amounts without also reducing risk on scenarios similar to those used in the actual cash flow modeling are inconsistent with these principles.

Note that the recommended C3 amount is determined as CTE90 less the reserve held on the policies being valued. This recommendation remains tentative at this time. An alternative that the LCWG is also considering is determining C3 as CTE90 – CTE65.

This alternate C3 calculation establishes the capital requirement as the difference between a measure of interest rate volatility at the capital risk level and a similar measure at the risk level inherent in reserves, both measured using a consistent set of cashflow assumptions. This may be a more theoretically correct determination of C3 capital.

Each of these alternative calculations has issues in terms of integrating into the existing RBC calculation. It is important that these issues are well understood in making decisions with respect to the recommendation. We continue to work on analyzing these issues.

The recommended approach of CTE90 – statutory reserve is consistent with C3 Phase II in its determination of C3 risk. For policies valued under a Principles-Based Approach, the statutory reserve will be consistent with CTE65 and the C3 amount determined will represent the spread of cashflow variation, measured on a consistent set of assumptions (anticipated experience and margins) , at different risk levels.

However, for policies valued under the current approach the statutory reserve may be higher or lower than the CTE65 amount.

> For those policies for which the reserve amount is lower than CTE65 the C3 amount determined is higher under the recommended approach. It could be viewed that the reserve in light of AOMR requirements should be reasonably proximate to a CTE65 amount and as such the added amount in the C3 requirement may not be an issue from the regulator perspective.
>
> For those policies for which the reserve amount is higher than CTE65 the C3 amount determined is lower under the recommended approach. In effect, redundancy in the reserve creeps into the C3 calculation, dampening the C3 amount. As the reserve exceeds the CTE65 amount, some or all of the C3 risk is covered by the reserve held by the company and the company should in some way be given credit for the risk being covered. Whether that credit should be provided through the C3 amount or some alternate means outside the C3 amount needs further consideration.

This (what issue?) is an important issue because the recommended calculation of C3 covers all inforce policies and not just those that have principles-based reserves. In the early years of adoption of the new method, most policies will fall into the group that does not have principles-based reserves.

.

Section 5. Definitions

The following terms shall have the indicated meanings for purposes of this report: (These definitions need to be reordered alphabetically)

A. Accumulated Deficiency: An amount measured as of the Projection Start Date and as of the end of each Projection Year that equals the projected Working Reserve less the amount of projected assets. The Accumulated Deficiency can be positive or negative.

B. Actuarial Report: A document prepared by the actuary that summarizes all of the material decisions supporting the calculation of the Reported Amount, including assumptions, margins and methodologies used to calculate the Reported Amount

C. ~~Asset~~ Business Segment: A group of assets associated with a group of policies that are modeled together to project future Accumulated Deficiencies. This grouping will generally follow the company's asset segmentation plan, investment strategies, or approach used to allocate investment income for statutory purposes.

D. ~~Best Estimate Assumptions~~Anticipated Experience: The actuary's expectation of future experience for a Risk Factor given available, relevant information pertaining to the assumption being estimated and set in such a manner that it is reasonable to expect that the actual value of the Risk Factor is as likely to be greater than the assumed value as less than the assumed value.

E. Cash Flow Model: A model that projects asset and liability cash flows used to determine the net cash flows and statement value of assets for the Scenario Amount.

F. Cash Surrender Value: The amount available to the policyholder upon surrender of the policy, prior to any outstanding policy indebtedness.

G. Clearly Defined Hedging Strategy: A strategy undertaken by a company to manage risks through the future purchase or sale of hedging instruments and the opening and closing of hedging positions meeting ~~the principles outlined in Section 4 of this report (particularly Principle 7) and~~ the requirements of a Clearly Defined Hedging Strategy as described in Subsection E (~~9~~10) of Section 6.

H. Conditional Tail Expectation (CTE): A statistical risk measure that is calculated as the average of all modeled outcomes (ranked from lowest to highest) at percentiles above the percentile corresponding to the CTE level. The CTE measure provides enhanced information about the tail of a distribution compared to that provided by the order statistics (percentiles). For example, CTE 90 averages all modeled outcomes at percentiles above the 90th percentile.

I. Discount Rates: The path of after-tax interest rates used to discount Accumulated Deficiencies in each Scenario for the Scenario Amount calculations.

J. Duration: The period of time elapsed from the Projection Start Date to a future date within the Projection Period.

K. ~~Exclusion~~ Alternative Amount: Provides for all material risks of a group of policies, including Material Tail Risk arising from sensitivities to changing economic conditions. It equals the amount determined by the actuary, using methods and assumptions deemed appropriate by the actuary, subject to the amount meeting the minimum requirements specified in this report.

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

M. Margin: An amount applied to Anticipated Experience ~~a Best Estimate Assumption~~ in order to derive a Prudent ~~Best~~ Estimate Assumption to provide for estimation error and adverse

deviation. The Margin should be directly related to the level of uncertainty in the Risk Factor for which the Prudent ~~Best~~ Estimate Assumption is made, whereby the greater the uncertainty, the larger the required Margin, with the Margin added or subtracted as needed to produce a larger Reported A~~a~~mount than would otherwise result without it.

N. Material Tail Risk: Material Tail Risk arises when the Scenario Amount for one or more Scenarios is materially higher when compared to the Scenario Amount for the rest of the Scenarios.

O. NGE Spread: The provision that a company uses to adjust actual experience to determine each Non-Guaranteed Element. The NGE Spread can be positive or negative. For example, if a company credits interest to policyholders at a rate 1.20% lower than its net investment yield, then the NGE Spread is negative one hundred and twenty basis points.

P. Net Investment Earnings: The amount used to determine the Net Asset Earned rate for each Projection Interval as defined in Subsection E~~F~~ (~~2~~6) of Section 6.

Q. Net Revenue Sharing Income: The amount of Revenue Sharing to be included in cashflow projections as defined in Subsection B of Section 8.

R. Non-Guaranteed Elements (NGE): Debits or credits to a policyholder's account value, benefit, premiums, or consideration that may be adjusted at the discretion of an insurance company. For purposes of this report, Non-Guaranteed Elements includes for example, policyholder dividends for participating policies and participation rates and asset fee charges for equity indexed universal life policies ~~as well as other items~~among other things.

S. Projection Start Date: The date on which the Projection Period begins.

T. Projection Year: A 12-month period starting on the Projection Start Date or an anniversary of the Projection Start Date.

U. Policy: A life insurance policy included in the scope of this Report.

V. Projection Interval: The time interval used in the Cash Flow Model to project the cash flow amounts (e.g. monthly, quarterly, annually).

W. Projection Period: The period over which the Cash Flow Model is run to produce the Scenario Amount.

X. Proprietary Predetermined Scenario Sets: A small number of paths of interest rate and equity performance that are not necessarily a representative sample of a larger set of stochastic paths, but a conservative sample developed by the company for the purpose of calculating the Stochastic Amount for policies within the scope of this report.

Y. Prudent ~~Best~~ Estimate Assumption: A deterministic assumption, used to represent a Risk Factor, developed by applying a Margin to Anticipated Experience ~~the Best Estimate Assumption~~ for that Risk Factor.

Z. Qualified Actuary: An actuary who meets the qualifications as defined in Section 9 (Certification and Documentation Requirements) to certify that the amounts for the policies subject to this report have been calculated following all applicable laws, regulations, actuarial guidelines (AGs) and Actuarial Standards of Practice. The Qualified Actuary shall be referred to throughout this report ~~-~~as "the actuary".

AA. Risk Factor: An aspect of future experience that is not fully predictable on the Valuation Date and that can affect the future financial results arising from the provisions of a Policy.

BB. Reported Amount: The minimum amount as of the Valuation Date for the policies falling within the scope of this report using a principles-based approach and equals the sum of the Stochastic Amount, and the ~~Exclusion~~Alternative Amount, if any, each as defined by this report, less the statutory reserve relating to the policies being valued.

CC. Revenue Sharing: Any arrangement or understanding by which an entity responsible for providing investment or other types of services makes payments to the company (or to one of its affiliates). Such payments are typically in exchange for administrative services provided by the company (or its affiliate), such as marketing, distribution and record-keeping. Only payments that are attributable to charges or fees taken from the underlying variable funds or mutual funds supporting the policies that fall under the scope of this report shall be included in the definition of Revenue Sharing.

DD. Scenario: A single path of outcomes used in a Cash Flow Model, such as a path of future interest rates, equity performance, and separate account fund performance. It could also include outcomes related to policyholder behavior (e.g., lapses) and company experience (e.g., mortality).

EE. Scenario Amount: Equals the amount determined in Section 6(~~H~~G)(4)(a) for a given set of policies for a given Scenario that is used as a step in the calculation of the Stochastic Amount.

FF. Starting Assets: The assets assigned to a~~n~~ Business ~~Asset~~ Segment prior to the calculation of the Reported Amount, and valued as of the Projection Start Date.

GG. Stochastic Amount: ~~Provides for all material risks of a group of policies, including Material Tail Risk arising from sensitivities to changing economic conditions. It equals t~~The amount determined by applying a prescribed CTE level to the distribution of Scenario Amounts over a broad range of stochastically generated Scenarios ~~and~~ calculated using Prudent ~~Best~~ Estimate Assumptions for all assumptions not stochastically modeled. The prescribed CTE level is to be established by the NAIC.

HH. Valuation Date: The date for which the Reported Amount is to be valued as required by the NAIC Life Risk Based Capital Instructions.

II. Working Reserve: The assumed reserve used in the projections of Accumulated Deficiencies supporting the calculation of the Scenario Amount.

.

Section 6. Definition of General Methodology

A. Summary

1. This report applies the principles of risk management, asset adequacy analysis, and stochastic modeling to establish the C3 RBC risk component for the products within its scope. In general, a stochastic approach to interest rates and equity performance is ~~required~~preferred. However, an exception to the stochastic modeling requirement can be made if certain conditions are met, as described in Section 6(~~H~~G)(5) below.
2. This report ~~requires~~ recommends that the Reported Amount for policies falling within its scope be based on an amount calculated using a stochastic method when appropriate (Stochastic Amount). The Stochastic Amount shall be determined based on projections of~~by projecting~~ net cash flows using the methods~~as~~ described below.
3. The actuary may elect to perform the calculations required by this report on a date other than the Valuation Date, but in no event earlier than six months before the Valuation Date, as long as an appropriate method is used to adjust the amounts so determined to the Valuation Date. Disclosure of the results of such adjustment and the methodology used to determine the adjustment is required.
4. The Stochastic Amount is calculated in the aggregate using a projection of net cash flows over a broad range of stochastically generated Scenarios, using Prudent ~~Best~~ Estimate Assumptions for all assumptions not stochastically modeled, and then applying a prescribed Conditional Tail Expectation level.
5. A company may elect to exclude certain policies from the stochastic modeling requirement if certain conditions are met (as described in Section 6(~~H~~G)(5) below.) The ~~Exclusion~~ Alternative Amount is otherwise determined for those policies excluded from the stochastic modeling requirement.
6. The Reported Amount is the sum of the Stochastic Amount and the Alternative ~~Exclusion~~ Amount, if any, less the statutory reserve relating to the policies being valued.

B. Prudent ~~Best~~ Estimate Assumptions

1. The actuary shall determine Prudent ~~Best~~ Estimate Assumptions used in the calculation for each Risk Factor that is not prescribed or is not stochastically modeled. The Prudent ~~Best~~ Estimate Assumptions shall vary from Scenario to Scenario as appropriate. A Prudent ~~Best~~ Estimate Assumption is developed by applying a Margin to ~~a Best Estimate Assumption~~Anticipated Experience for the Risk Factor. The Prudent ~~Best~~ Estimate Assumption for each Risk Factor shall be:
    a. Consistent with the ~~guiding principles~~general concepts stated in Section 4 herein;
    b. Based on any relevant and credible experience that is available, including, but not limited to, the company's own experience studies and industry experience studies;
    c. Set to produce, together with other Prudent ~~Best~~ Estimate Assumptions, an overall value for the Reported Amount that is consistent with the stated level of conservatism in statutory reserves; where the level of conservatism in statutory reserves is not explicit, the actuary should assume the overall margin is at the 65 CTE level; and
    d. Supported by a documented process to reassess the appropriateness of the assumptions in future valuations.

2. Anticipated ExperienceBest Estimate Assumptions. The actuary shall use company experience, if relevant and credible, to establish Anticipated Experience a Best Estimate Assumption for any Risk Factor. To the extent that company experience is not available or credible, the actuary may use industry experience or other credible data to establish Anticipated Experiencethe Best Estimate Assumption, making modifications as needed to reflect the actuary's expectation of the risk.

3. In setting the Margin for a Risk Factor, the actuary must assure that:

   a. The Margin is directly related to uncertainty in the Risk Factor, whereby the greater the uncertainty, the larger the required Margin, with the Margin added or subtracted as needed to produce a larger Reported Amount than would otherwise result without it;

   b. Larger Margins are used if experience data are lacking or limited or lacking credibility than would be the case if abundant and relevant and credible experience data are available;

   c.Sensitivity testing is performed to determine the assumptions that are material to the extent that a small change in the assumptions lead to a large change in the Reported Amount. If such case occurs, a larger Margin would be needed unless relevant credible experience is relied upon to conclude otherwise; and

   d.c. The Margin satisfies any further conditions set forth by this report and applicable Actuarial Standards of Practice with respect to Margins or Prudent Best Estimate Assumptions for the Risk Factor.

4. In addition, in setting the Margin for a Risk Factor, the actuary must consider:

   a. That larger Margins may be required to reflect contingencies related to policyholder behavior in situations where a given policyholder action results in the surrender or exercise of a valuable option; and

   b. The magnitude of fluctuation in the historical experience of the company for the Risk Factor as measured by the standard deviation around the mean or other standard statistical measure (if meaningful historical experience data are available for the Risk Factor).

C. Cash Flow Models

1. Purpose. The Stochastic Amount calculations require the use of Cash Flow Models for each AssetBusiness Segment. The Cash Flow Models shall:

   a. Project the premiums, benefits, expenses, and other applicable revenue items to be used in the calculations; and
   b. Project the total asset and liability cash flows, Net Investment Earnings, and invested asset balances for the purpose of determining the path of Accumulated Deficiencies.

2. General description of cash flow projections. For each Scenario for the Scenario Amount, a cash flow projection shall be made reflecting Federal Income Tax and shall reflect the dynamics of the expected cash flows for the entire AssetBusiness Segment. The projection shall include the effect of all material product features, both guaranteed and non-guaranteed.

   a. Actual gross premiums received from the policyholder shall be included as revenue in the cash flow projection. Amounts charged to account values on General Account business (such as COI and expense charges) shall not be included in the cash flow

projection as revenue, but shall be projected since they will affect the level of cash surrender benefits.

b. Net cash flows between the General Account and Separate Account for variable products will be included in the cash flow projection. Examples include allocation of net premiums to the Separate Account, policyholder-initiated transfers between fixed and variable investment options, transfers of Separate Account values to pay death or withdrawal benefits, and amounts charged to Separate Account values for cost of insurance, expense, etc.

c. Insurance company expenses (including overhead expenses), commissions, fund expenses, contractual fees and charges, Revenue Sharing income received by the company (net of applicable expenses) and cash flows associated with any reinsurance are to be reflected on a basis consistent with the requirements herein.

d. Asset cash flows shall include cash receipts/disbursements associated with investment income, realized capital gains and losses, principal repayments, appropriate asset default costs, investment expenses, income from hedge instruments, asset prepayments, and asset sales.

e. Throughout the projection, where estimates of asset or liability items are made that are neither stochastically generated nor prescribed, such estimates shall be on a Prudent ~~Best~~ Estimate basis.

3. Cash flows from starting assets. Assets at the beginning of the projection shall be selected from the company's actual assets backing the policies associated with each ~~Asset~~Business Segment. The amount of starting assets shall be determined as described in Section 6.E.1. Cash flows on General Account starting assets for each Projection Interval shall be determined as follows:

a. Fixed income investments (e.g., public bonds, convertible bonds, preferred stocks, private placements, ABS, commercial mortgage loans, residential mortgage loans, MBSs, and CMOs) including hedge instruments associated with these assets.

1. Gross investment income and principal repayments shall be modeled in accordance with the contractual provisions of each asset and in a manner consistent with each Scenario. Grouping of assets is allowed if the actuary can demonstrate that grouping does not result in a materially lower Scenario Amount than would have been obtained using a seriatim approach.

2. Appropriate asset default costs and investment expenses shall be reflected through a deduction to the gross investment income using Prudent ~~Best~~ Estimate Assumptions.

3. Realized capital gains and losses on asset sales shall be modeled in a manner that is consistent with the company's documented investment and disinvestment policy.

4. Any uncertainty in the timing and amounts of asset cash flows related to the paths of interest rates, equity returns, or other economic values contained in the various Scenarios shall be reflected directly in the projection of asset cash flows under the various Scenarios within the model as defined in Section 6.D.

b. Equity investments (i.e., non-fixed income investments having substantial volatility of returns such as common stocks and real estate investments) including hedge instruments associated with these assets.

1. The number of equity investment categories, and the allocation of specific assets to each category (e.g. large cap stocks, international stocks, owned real estate, etc.) shall be determined by the actuary as described in Section 6.E.6.

2. The gross investment return (including realized and unrealized capital gains) for each investment category shall be projected in a manner that is consistent with the projected total return on the S&P 500 for the Scenario, reflecting any differences in the total return and risk between the S&P 500 and each equity investment category. This does not imply a strict functional relationship between the returns on the various investment categories and the return on the S&P 500, but it would generally be inappropriate to assume that an investment category consistently 'outperforms' (i.e. has lower risk, but achieves a higher expected return relative to the efficient frontier) the S&P 500.

3. The projected S&P 500 return for each Scenario shall be modeled stochastically as described in Section 6.D.1.

4. The time of sale of the asset shall be modeled in a manner that is consistent with the investment policy of the company for the respective equity investment categories. Investment expenses shall be reflected through a deduction to the gross investment return using Prudent ~~Best~~ Estimate Assumptions.

c. All other assets. Asset cash flows on other assets that are not described in item a) and b) above shall be modeled using methods consistent with the methods described in items a) and b) above. This includes assets that are a hybrid of fixed income and equity investments.

4. Cash flows from reinvestment assets. Net cash flows in each Projection Interval shall be reinvested in a manner consistent with the company's investment policy for each ~~Asset~~Business Segment. Handling of disinvestment shall be consistent with the company's investment policy and reflect economic reality such as the reasonable short-term borrowing capacity of the company. Cash flows from reinvestment assets shall be determined as described in Section 6.C.3., but with the additional requirement that net spreads (net of default costs and investment expenses) over U.S. Treasuries reflected in the purchase yields shall be prescribed by the NAIC.

[~~Drafting~~ Note: the NAIC shall define the nature and level of the prescribed cap.]

5. Future Interest Maintenance Reserve (IMR) amounts. Realized capital gains and losses arising from changes in interest rates can be reflected in the Projection Interval when they occur, or can be spread out over future Projection Intervals by establishing a new IMR amount.

6. Length of Projection Period. The Projection Period shall be sufficiently long that no materially greater Stochastic Amount would result from a longer Projection Period.

7. Simplified approaches. Simplified approaches may be acceptable if they can be shown to produce amounts that are not materially different than those produced by a more robust cash flow model.

8. Asset adequacy analysis principles and techniques as defined by applicable regulations, actuarial guidelines and Actuarial Standards of Practices shall be relied on for many of the detailed aspects encountered in projecting cash flows.

D. Description of Scenarios

1. The cash flow projections shall be made in a manner that reflect stochastically generated paths of U.S. Treasury yield curves, S&P 500 returns for General Account equity assets, and future fund performance for Separate Account assets. These stochastically generated paths shall be determined by:

   a. Stochastic generators and model parameters prescribed by the NAIC,

   b. Pre-packaged scenarios generated from the stochastic generators and model parameters prescribed by the NAIC,

   c. The use of Proprietary Predetermined Scenario Sets developed by the company for the purpose of calculating the Stochastic Amount for policies within the scope of this report, or

   [~~Drafting~~ Note: The Proprietary Predetermined Scenario Sets will be constructed from a universe of scenarios in a manner that produces a result that is reasonably similar to, but not less than, the prescribed CTE amount. This is intended to provide companies an alternative to modeling a large sample from an interest rate generator, or a large number of prepackaged scenarios. Additional guidance is needed to assist the actuary in developing and justifying the use of appropriate Proprietary Predetermined Scenario Sets]

   d. Stochastic models developed by the company if mandated calibration criteria established by the NAIC are met. Returns for equity performance and groupings of variable funds shall be determined on a stochastic basis such that the resulting distribution of the Gross Wealth Ratios of the Scenarios meets the scenario calibration criteria established by the NAIC.

   If the company chooses to use a fully integrated interest rate/equity return model, the equity return scenarios must satisfy the equity return calibration criteria adopted by the NAIC and the interest rate scenarios must satisfy the interest rate calibration criteria adopted by the NAIC.

   [~~Drafting~~ Note: It is anticipated that a prescribed interest rate generator and model parameter values like the C3P1 generator, as well as a prescribed equity return generator and model parameter values will be published and updated from time to time.

   It is also anticipated that a published document, such as an Actuarial Guideline by NAIC, will define a prescribed set of pre-packaged equity return scenarios similar to those used for C3P2 RBC requirements for variable annuities, as well as a prescribed set of pre-packaged interest rate scenarios. In addition to the pre-packaged scenarios, it is anticipated that a scenario-picking tool will be available.

   In addition, it is anticipated that the published document will contain calibration criteria for equity return models that are similar to those used for the C3P2 RBC requirements for variable annuities, as well as calibration criteria for interest rate models. Calibration criteria for interest rate models are in the process of being developed, and may not be available at the time the report is adopted.]

2. The number of scenarios for which Scenario Amounts are computed shall be considered to be sufficient if any resulting understatement in Reported Amount, as compared with

that resulting from running a broader/more robust range of additional scenarios, is not material.

It is anticipated that the scenarios being used for the purposes of the C3 RBC amount will generally be the same scenarios as those used in the determination of Principles-Based reserves. However, the use of the same scenarios underlying the reserves may not be appropriate for capital with respect to the number of scenarios and any resulting understatement of Reported Amount. The actuary should document and justify the choice of scenarios used in the determination of C3 capital.

E. Starting and Projected Assets

1. Starting Asset Amount. The value of assets at the Projection Start Date shall be set equal to the statutory reserve on the policies being valued at the Projection Start Date. Assets shall be valued consistently with their annual statement values. The outstanding Interest Maintenance Reserve (IMR) shall be reflected as an adjustment to invested assets. Any negative IMR balance can only be reflected to the extent that a positive IMR balance exists on policies outside the scope of this calculation. The amount of such asset values shall equal the sum of the following items, all as of the Projection Start Date:

   a. All of the Separate Account assets supporting the policies;

   b. An amount of assets held in the General Account equal to the reserve on the policies being valued as of the Projection Start Date less the amount in a.) above.

   General Account assets chosen for use as described above shall be selected on a consistent basis from one valuation hereunder to the next. For products in which a substantial portion of policyholder funds are allocated to Separate Accounts, in many instances the initial General Account assets may be negative, resulting in a projected interest expense. ~~General Account assets chosen for use as described above shall be selected on a consistent basis from one valuation hereunder to the next.~~

2. Due and Accrued Investment Income. Starting Assets shall include the balance of any due and accrued investment income on the invested assets included in the starting asset amount.

3. Treatment of Hedge Assets. Any hedge assets allocable to the business being valued and meeting the requirements described in Section 6.E.9 below shall be reflected in the projections and included with other General Account assets under Section 6.E.1.b. above. To the extent the sum of the value of such hedge assets and the value of assets in Section 6.E.1.a. above is greater than the estimated value of the Reported Amount as of the start of the projection, then Section 6.E.1.b. above may include enough negative General Account assets such that the sum of items a.) and b.) above equals the estimated value of the Stochastic Amount as of the start of the projection.

4. Treatment of IMR. Any positive IMR balance allocable to the business being valued ~~may~~ is to be included as a negative asset in the determination of the General Account Assets under item ~~2~~1) above, thus allowing additional positive General Account Assets to be allocated to support the calculation. Any negative IMR balance allocable to the business being valued, to the extent it offsets positive IMR balances elsewhere in the entity, must be included as a positive asset with the opposite effect as described above.

5. Valuation of Projected Assets. The values of projected Starting Assets shall be determined in a manner consistent with their values at the start of the projection. For reinvestment assets, the value shall be determined in a manner consistent with the value of assets at the start of the projection that have similar investment characteristics.

6. Net Investment Earnings. Net Investment Earnings shall include investment income plus capital gains and losses (excluding capital gains and losses that are included in the IMR), minus appropriate default costs and investment expenses. Net Investment Earnings shall include policy loan interest (net of investment expenses) and any change in due and accrued investment income during the Projection Interval. Net Investment Earnings shall also include income from hedge instruments and amortization of the Interest Maintenance Reserve on all applicable assets.

~~6.~~7. Grouping of equity investments in the General Account. The portion of the Starting Asset Amount held in the General Account represented by equity investments (e.g. common stocks, real estate investments) may be grouped for modeling using an approach that establishes various equity investment categories, as determined by the actuary, with each investment category defined to reflect the different types of equity investments in the portfolio. In assigning each equity investment to an investment category, the fundamental characteristics of the asset shall have an appropriate relationship to the other assets assigned to the investment category.

An appropriate proxy for each equity investment category shall be designed in order to develop the investment return paths. The development of the returns for the proxy equity investment categories is a fundamental step in the modeling and can have a significant effect on results. As such, the actuary must map each investment category to an appropriately crafted proxy investment category normally expressed as a linear combination of recognized market indices (or sub-indices). The proxy construction process should include an analysis that establishes a firm relationship between the investment return on the proxy and the specific equity investment category.

~~7.~~8. Grouping of Variable Funds and Sub-accounts. The portion of the Starting Asset Amount held in the Separate Account represented by the variable funds and the corresponding account values may be grouped for modeling using an approach that recognizes the investment guidelines and objectives of the funds. In assigning each variable fund and the variable sub-accounts to a grouping for projection purposes, the fundamental characteristics of the fund shall be reflected and the parameters shall have the appropriate relationship to the required calibration points of the S&P 500. The grouping shall reflect characteristics of the efficient frontier (i.e., returns generally cannot be increased without assuming additional risk).

An appropriate proxy for each variable sub-account shall be designed in order to develop the investment return paths. The development of the returns for the proxy funds is a fundamental step in the modeling and can have a significant effect on results. As such, the actuary must map each variable account to an appropriately crafted proxy fund normally expressed as a linear combination of recognized market indices (or sub-indices). The proxy construction process should include an analysis that establishes a firm relationship between the investment return proxy and the specific variable funds.

~~8.~~9. Modeling of Hedges. The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the policies falling under the scope of the report shall be included in the projections when determining the Stochastic Amount. If the company is following a Clearly Defined Hedging Strategy and the hedging strategy meets the requirements as defined in Section 6.E.9. below, the projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of that strategy.

Specific guidance as to the modeling of hedges is given in Section 7.

~~9.~~10. Requirements of a Clearly Defined Hedging Strategy. In order to qualify as a Clearly Defined Hedging Strategy, the strategy ~~must meet the principles outlined in Section 4 of this report (particularly Principle 7) and~~ shall, at a minimum, identify:

a. The specific risks being hedged (e.g., delta, rho, vega, etc.);
b. The hedge objectives;
c. The risks not being hedged (e.g., variation from expected mortality, withdrawal, and other utilization or decrement rates assumed in the hedging strategy, etc.);
d. The financial instruments that will be used to hedge the risks;
e. The hedge trading rules including the permitted tolerances from hedging objectives;
f. The metric(s) for measuring hedging effectiveness;
g. The criteria that will be used to measure effectiveness;
h. The frequency of measuring hedging effectiveness;
i. The conditions under which hedging will not take place;
j. The person or persons responsible for implementing the hedging strategy;
k. Areas where basis, gap or assumption risk related to the hedging strategy have been identified; and
l. The circumstances under which the hedging strategy will not be effective in hedging the risks.

The hedge strategy may be dynamic, static, or a combination thereof.

Strategies involving the offsetting of the risks associated with other products outside of the scope of this report do not currently qualify as a Clearly Defined Hedging Strategy.

F. Discount Rates

1. For the Scenario Amount calculations, the path of Discount Rates for each ~~Asset~~Business Segment shall be equal to the implied forward rates from the swap curve for companies that do not use an integrated model. Companies that do have an integrated model may use the one-year U.S. Treasury rates generated by that model or the swap curve, but must use the method chosen consistently from year to year. Whether from a model or from the swap curve, the discount rates need to be reduced for purposes of Federal Income Tax.

~~G.The Exclusion Amount~~

~~1.Purpose. The purpose of the Exclusion Amount is to produce an amount that is adequate to cover the product benefits and expense, reflecting future revenue, for those policies for which the stochastic modeling exclusion has been made.~~

~~2.Exclusion Amount Description. The Exclusion Amount for a given set of policies within an Asset Segment is to be determined by the actuary. The actuary must be able to demonstrate that the Exclusion Amount is not less than the Stochastic Amount, which would have been calculated for such policies had the stochastic modeling exclusion, not been made. Furthermore, the Exclusion Amount may not be less than the sum of the following amounts:~~

~~a.The statutory reserve at the Valuation Date relating to such policies; and~~
~~b.1% of item (a) above in the case of the company submitting an unqualified actuarial opinion based on asset adequacy testing; otherwise 2% of item (a) above.~~

~~If the Exclusion Amount is determined on a date that precedes the Valuation Date, then the Exclusion Amount shall be adjusted to the Valuation Date.~~

~~The actuary shall annually re-evaluate the adequacy of the Exclusion Amount. If, as of the end of any calendar year, the actuary determines the Stochastic Amount will exceed the Exclusion Amount for the group of policies:~~

~~i.The Exclusion Amount shall be increased so as to exceed the Stochastic Amount, or~~
~~ii.The exclusion shall be discontinued and the Stochastic Amount shall be held.~~

~~3.Exclusion Amount Demonstration. A complete demonstration supporting the exclusion must be provided in the initial exclusion year and at least once every three calendar years subsequent to the initial exclusion.~~

~~H.~~G. The Stochastic Amount

1. Purpose. The purpose of the Stochastic Amount is to produce an amount that is adequate to cover the product benefits, revenue and expenses over a broad range of stochastically generated Scenarios for all policies falling under the scope of this report. It is meant to capture all material risks, including Material Tail Risk. The Stochastic Amount may be determined assuming that all, or only some, of the risks underlying the policies are modeled stochastically, but at a minimum, it must assume that interest rate movements, equity movements, and separate account fund performance be modeled stochastically.

2. Stochastic Amount Calculation Description: The Stochastic Amount is determined using the following steps:
   a. Determine policy grouping as defined in Subsection ~~H~~ G (3),

b. Determine Prudent ~~Best~~ Estimate Assumptions as defined in Section 6.B above,
c. Project cash flows for each Business ~~Asset~~ Segment for each Scenario as described in Subsections C, D, and E,
d. Calculate the path of Discount Rates for each Business ~~Asset~~ Segment for each Scenario as described in Subsection F,
e. Calculate the Scenario Amount for each Scenario using the methodology described in Subsection ~~H~~ G (4),
f. Calculate the Stochastic Amount as described in subsection ~~H~~ G (6) below.

3. Grouping of Policies for Modeling: Projections may be performed for each policy in force on the date of valuation or by grouping policies into representative cells of model plans using all characteristics and criteria having a material impact on the size of the Reported Amount. Grouping shall not be done in a manner that intentionally understates the resulting Reported Amount.

4. Calculation of the Scenario Amount

a. For each Scenario, the Scenario Amount for one or more Business ~~Asset~~ Segments is determined by following steps (1) through (6) below:
    1. Calculate the net accumulated asset amount for each Business ~~Asset~~ Segment at the end of each Projection Year and at the Projection Start Date, as described in subparagraph 4(d) below. Note that the net accumulated asset amount can be either positive or negative.
    2. Calculate the Accumulated Deficiency for each Business ~~Asset~~ Segment at the end of each Projection Year and at the Projection Start Date for each Business ~~Asset~~ Segment as the excess of the Working Reserve over the aggregate accumulated asset amount at that duration. Note that the Accumulated Deficiency can be either positive or negative. At the option of the company, the Working Reserve may be set equal to the cash surrender value for all policies having a non-zero cash surrender value at any duration and equal to the greater of zero and the present value of expected benefits and expenses less the present value of expected premiums, where these present values are calculated using Prudent ~~Best~~ Estimate Assumptions, for all other policies. If this option is not used, the actuary shall certify that, for each Business ~~Asset~~ Segment, the Working Reserve at the end of each Projection Year is a reasonable estimate of the aggregate reserve at that duration and that the sequence of Working Reserves is consistent with the actual reserve on the Projection Start Date.
    3. At the end of each Projection Year and at the Projection Start Date, calculate the discounted value of the Accumulated Deficiency for each Business ~~Asset~~ Segment that was calculated in step 4.a.(2) above. The discounted value shall be calculated using the path of Discount Rates for the Business ~~Asset~~ Segment from the Projection Start Date to the end of the Projection Year.
    4. Determine the aggregate discounted value of the Accumulated Deficiency at the end of each Projection Year and at the Projection Start Date as the sum of the discounted value of Accumulated Deficiency at that Duration across Business ~~Asset~~ Segments.
    5. Determine the Scenario Amount as the sum of (a) the statement value of the starting assets across Business ~~Asset~~ Segments and (b) the maximum of the values calculated in step (6) below. Note that the amount in (b) herein can be either positive or negative.

6. Adjust the Scenario Amount for the difference between the modeled and actual tax reserves at the beginning of the projection, if necessary. A tax adjustment is not required in the following situations:
    a. Tax reserves are projected directly; that is, it is not assumed that projected tax reserves are equal to Working Reserves, whether these are cash values or other approximations.
    b. Tax reserves at the beginning of the projection period are equal to Working Reserves.

    In the case where actual tax reserves are higher than the modeled tax reserve, the modeled tax results are overstated each year for reserves in the projection. In the case where actual tax reserves are lower than the modeled tax reserve, the modeled tax results are understated each year for reserves in the projection. If a tax adjustment is required the Total Asset Requirement (TAR) must be increased (decreased) on an approximate basis to correct for the understatement (overstatement) of modeled tax expense. The differential taxable income at the time of claim will be realized over the projection and will be measured approximately using the "duration to worst", i.e. the duration producing the lowest present value for each scenario. The method of developing the approximate tax adjustment is described below.

    The adjustment to the Scenario Amount may be approximated as the corporate tax rate (i.e. 35%) times "f" times the difference between modeled tax reserves and actual tax reserves at the start of the projections. For this calculation, f is calculated as follows. For the scenarios reflected in calculating CTE (90), the lowest of these present values of Accumulated Deficiency is determined for each calendar year-end and its associated projection duration is tabulated. At each such duration, the ratio of the number of contracts in force (or covered lives for group contracts) to the number of contracts in force (or covered lives) at the start of the modeling projection is calculated. The average ratio is then calculated, over all CTE (90) scenarios, and f is one minus this average ratio.

b. The aggregation of one or more Business ~~Asset~~ Segments for purposes of determining the Scenario Amount is up to actuarial judgment in accordance with the requirements of Section 6.C.7.

    It is not required that each Business ~~Asset~~ Segment use the same set of stochastic Scenarios. However, any set of Scenarios would be subject to the scenario requirements specified in Section 6.D above. The use of a different set of stochastic Scenarios would generally result in the inability to aggregate results across the two or more Scenario sets.

c. For each Scenario the net accumulated asset amount for a~~n~~ Business ~~Asset~~ Segment at the end of each Projection Year is equal to the projected statement value of invested assets for that Business ~~Asset~~ Segment. For all Scenarios, the net accumulated asset amount for a~~n~~ Business ~~Asset~~ Segment at the Projection Start Date is the statement value of starting assets for that ~~Asset~~ Business Segment. The projected statement value of invested assets at any future duration must reflect the accumulation of cash flows into and out of the portfolio for the items listed in (1) through (6) below as described in Sections 6.C.2. and 6.C.3. The net accumulated asset amount can be either positive or negative, according to:

1. Benefits, including but not limited to death and cash surrender benefits;
2. Expenses, including but not limited to, commissions, general expenses, and premium taxes, but excluding Federal Income Tax;
3. Gross premium payments;
4. Other applicable revenue such as fees and revenue on assets invested in sub-accounts, and any Revenue Sharing income;
5. Net payments to/from the General Account from/to the Separate Account; and
6. Net Investment Earnings as defined in Section 6.E~~F~~.~~2~~6.

5. Stochastic Modeling Exclusion: It may not be necessary to perform stochastic modeling for groups of policies where it can be demonstrated that the Stochastic Amount will not be greater than the ~~Exclusion~~Alternative Amount. Thus, the actuary may elect to exclude certain groups of policies from the stochastic modeling requirement upon demonstration that the ~~Exclusion~~Alternative Amount for those policies (which includes any additional amount that the actuary may decide to add for the purpose of the stochastic modeling exclusion) will adequately provide for all material risks underlying such policies.

   a. To exclude a group of polices from the stochastic modeling requirement, the actuary shall, for the group of policies to be excluded:

      1. Determine the ~~Exclusion~~Alternative Amount for these policies. The ~~Exclusion~~Alternative Amount shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of that strategy only if the company is following a Clearly Defined Hedging Strategy and the hedging strategy meets the requirements as defined in Section 6.E.9 above.

      2. Provide a demonstration that the ~~Exclusion~~Alternative Amount adequately provides for all material risks underlying such policies. An acceptable demonstration should:
         a. Provide a reasonable assurance that if the Stochastic Amount was calculated for only those polices subject to the stochastic modeling exclusion, it would not be greater than the ~~Exclusion~~Alternative Amount for such policies;
         b. Provide sufficient supporting information that an experienced independent actuarial reviewer can assess the reasonableness of the conclusion to exclude the group of policies; and
         c. Provide an effective evaluation of the residual risk exposure resulting from risk mitigation techniques such as hedge instruments and reinsurance.

6. The Stochastic Amount

   The Stochastic Amount is determined as the sum of applying steps a. and b. below to each segment or set of segments for which a Scenario Amount has been calculated.

      a. Rank the Scenario Amounts from lowest to highest; and
      b. Take the average of the highest 10% of the Scenario Amounts.

   If the Scenario Amounts are determined on a date that precedes the Valuation Date, then the Scenario Amounts shall be adjusted.

[~~Drafting~~ Note: the CTE risk level shall be determined by the NAIC. If Proprietary Pre-determined Scenarios Sets are used, the derivation of the Stochastic Amount will be defined by a separate process, rather than the process defined above.]

H. The Alternative Amount

1. Purpose. The purpose of the Alternative Amount is to produce an amount that is adequate to cover the product benefits and expense, reflecting future revenue, for those policies for which the stochastic modeling exclusion has been made.

2. Alternative Amount Description. The Alternative Amount for a given set of policies within a Business Segment is to be determined by the actuary. The actuary must be able to demonstrate that the Alternative Amount is not less than the Stochastic Amount, which would have been calculated for such policies had the stochastic modeling exclusion~~,~~ not been made. Furthermore, the Alternative Amount may not be less than the sum of the following amounts:

   a. The statutory reserve at the Valuation Date relating to such policies; and
   b. 1% of item (a) above in the case of the company submitting an unqualified actuarial opinion based on asset adequacy testing; otherwise 2% of item (a) above.

   If the Alternative Amount is determined on a date that precedes the Valuation Date, then the Alternative Amount shall be adjusted to the Valuation Date.

   The actuary shall annually re-evaluate the adequacy of the Alternative Amount. If, as of the end of any calendar year, the actuary determines the Stochastic Amount will exceed the Alternative Amount for the group of policies:

      i. The Alternative Amount shall be increased so as to exceed the Stochastic Amount, or
      ii. The exclusion shall be discontinued and the Stochastic Amount shall be held.

3. Alternative Amount Demonstration. A complete demonstration supporting the exclusion from stochastic testing must be provided in the initial exclusion year and at least once every three calendar years subsequent to the initial exclusion.

I. The Reported Amount

1. The Reported Amount shall equal to the sum of the Stochastic Amount and the ~~Exclusion~~Alternative Amount, if any, less the statutory reserve relating to the policies being valued.

2. The Reported Amount relates to Interest Rate Risk and / or Equity/Market Risk. The portion, which is attributable to Interest Rate Risk, is to be combined with the current C3a component of the formula. The portion, which is attributable to Equity/Market Risk, is to be allocated and combined with the current C3c component of the formula.

   The Reported Amount shall be allocated between the interest and market risk components as follows.

   [Note: Allocation method is outstanding.]

J. Treatment of Non-Guaranteed Elements

1. Non-Guaranteed Elements (NGE) are to be included in the models used to project future cash flows for the Stochastic Amount. Where NGEs are based on some aspect of experience, future changes in the level of NGEs can be reflected in the Cash Flow Model based on the experience assumed in each Scenario. The intent is to model the determination of NGEs as the company would actually set the NGEs if experience unfolded in a manner consistent with the Scenario under consideration, but reflecting a Margin for uncertainty as described below.

2. As would be the case in actual practice, the projected NGE should not be assumed to change simultaneously with the change in projected experience, but only at the date following the recognition of a change in experience on which the company would normally implement a change.

3. When determining the NGE assumption for each Scenario, the actuary must take into consideration those factors that could cause the company to modify its current NGE scale and/or its current NGE Spreads, such as existence of contract guarantees.

4. Due to the uncertainty in the future level of NGEs arising from factors such as those listed below, a Margin should be established on the NGE assumption that would result in an increase in the Scenario Amount compared to the Scenario Amount that would result from assuming that each Non-guaranteed Element equals the experience of the Scenario plus 100% of the current NGE Spread. Factors that must be considered when determining the Margin include:

   a. The company's ability to modify its NGE scale and/or NGE Spreads, and the company's past NGE practices and current NGE policies;

   b. The impact on policyholder behavior as a result of maintaining the current Non-guaranteed Element scale and/or NGE Spreads under the Scenario; and

   c. The impact of the NGE assumption on the competitive position of the product under the Scenario.

5. Any liability for dividends declared but not yet paid that has been established according to statutory accounting procedures as of the Valuation Date may be reported separately from the statutory reserve. Accordingly, where such a separate liability is reported on the statutory balance sheet as of the Valuation Date, any dividends that are included in the separate liability shall be excluded from the cash flow projection.

Section 7. Guidance and Requirements for Modeling of Hedges

A. General Considerations

The appropriate costs and benefits of hedging instruments that are currently held by a company in support of the policies falling under the scope of the report shall be included in the projections when determining the Stochastic Amount.

If a company is following a Clearly Defined Hedging Strategy and the hedging strategy meets the requirements as defined in Section 6.E.9 the projections shall take into account the appropriate costs and benefits of hedge positions expected to be held in the future through the execution of that strategy.

Before either a new or revised hedging strategy can be used to reduce the amount of the Reported Amount otherwise calculated, the hedging strategy should be in place (i.e., effectively implemented by the company) for at least three months. The company may meet the time requirement by having evaluated the effective implementation of the hedging strategy for at least three months without actually having executed the trades indicated by the hedging strategy (e.g., mock testing or by having effectively implemented the strategy with a product exhibiting similar risks for at least three months).

These requirements do not supersede any statutes, laws, or regulations of any state or jurisdiction related to the use of derivative instruments for hedging purposes and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction.

B. Background

The analysis of the impact of the hedging strategy on cash flows is typically performed using either one of two methods as described below. Although a hedging strategy would normally be expected to reduce risk provisions, the nature of the hedging strategy and the costs to implement the strategy may result in an increase in the amount of the Reported Amount otherwise calculated.

The fundamental characteristic of the first method is that all hedging positions, both the currently held positions and those expected-to-be held in the future, are included in the cash flow model used to determine the Reported Amount.
The fundamental characteristic of the second method is that the effectiveness of the current hedging strategy (including currently held hedge positions) on future cash flows is evaluated, in part or in whole, outside of the cash flow model. In this case, the reduction to the Reported Amount otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.

Regardless of the methodology used by the company, the ultimate effect of the current hedging strategy (including currently held hedge positions), on the Reported Amount needs to recognize all risks, associated costs, imperfections in the hedges and hedging mismatch tolerances associated with the hedging strategy. The risks include, but are not limited to: basis, gap, price, parameter estimation, and variation in assumptions (mortality, persistency, withdrawal, annuitization, etc.). Costs include, but are not limited to: transaction, Margin (opportunity costs associated with Margin requirements) and administration. In addition, the reduction to the Reported Amount attributable to the hedging strategy may need to be limited due to the uncertainty associated with the company's ability to implement the hedging strategy in a timely and effective manner. The level of operational uncertainty varies indirectly with the amount of time that the new or revised strategy has been in effect or mock tested.

No hedging strategy is perfect. A given hedging strategy may eliminate or reduce some, but not all risks, transforms some risks into others, introduces new risks or has other imperfections. For example, a delta-only hedging strategy does not adequately hedge the risks measured by the "Greeks" other than delta. Another example is that financial indices underlying typical hedging instruments typically do not perform exactly like the separate account funds, and hence the use of hedging instruments has the potential for introducing basis risk.

C. Calculation of CTE Amount (reported)

The actuary should begin by calculating "CTE Amount (best efforts)" – the results obtained when the Stochastic Amount is based on incorporating the hedging strategy (including currently held hedge positions) into the stochastic cash flow model, including all of the factors and assumptions needed to execute the hedging strategy (e.g., stochastic implied volatility).

Because most models will include at least some approximations or idealistic assumptions, CTE Amount (best efforts) may overstate the impact of the hedging strategy. To compensate for potential overstatement of the impact of the hedging strategy, the company must recalculate the Stochastic Amount reflecting the impact of risks not completely reduced, eliminated or contemplated by the hedging strategy, all of the costs associated with the hedging strategy, the imperfections in the hedging strategy, and any uncertainty over the effectiveness of the hedging strategy. The result so obtained is called "CTE Amount (adjusted)". In some situations the determination of CTE Amount (adjusted) may include both direct and indirect techniques.

Finally, the reported value for the Stochastic Amount is given by:

CTE Amount (reported) = CTE Amount (best efforts) +
E × MAX[0,CTE Amount (adjusted) – CTE Amount (best efforts)]

The value for E (an "error factor") reflects the actuary's view as to the level of sophistication of the stochastic cash flow model. As the sophistication of the stochastic cash flow model increases, the value for E decreases, subject to minimum of 0.05 (i.e., the greater the ability of the CTE Amount (best efforts) model to capture all risks and uncertainties, the lower the value of E). If the model used to determine the "CTE Amount (best efforts)" is "state of art", the value "CTE Amount (adjusted) – CTE Amount (best efforts)" may be nominal. On the other hand, if the model used to determine the "CTE Amount (best efforts)" is simplistic, the value "CTE Amount (adjusted) – CTE Amount (best efforts)" may be significant.

D. Specific Conditions and Requirements

As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current hedging strategy (including currently held hedge positions) for purposes of reducing the Reported Amount, the actuary should review actual historical hedging effectiveness. The actuary must evaluate the appropriateness of the assumptions on future trading, transaction costs, and other elements of the model, the strategy, the mix of business, and other items that could result in materially adverse results. This includes an analysis of model assumptions that, when combined with the reliance on the hedging strategy, may result in adverse results relative to those modeled. The parameters and assumptions must be adjusted (based on testing contingent on the strategy used and other assumptions) to levels that fully reflect the risk, based on historical ranges and foreseeable future ranges of the assumptions and parameters. If this is not possible by parameter adjustment, the model must be modified to reflect them at either "best estimates" or adverse estimates of the parameters.

A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with some guaranteed policyholder options embedded in some products and these same sensitivities associated with the hedging assets are subject to material discontinuities. Any hedging strategy, including a delta hedging strategy, can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed policyholder options embedded in the variable annuities and other in-scope products and these same sensitivities associated with the

hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the Reported Amount, the actuary must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

Implementing a strategy that has a strong dependence on acquiring hedging assets at specific times that depend on specific values of an index or other market indicators may not be implemented as precisely as planned.

The combination of elements of the cash flow model, including the initial actual market asset prices, prices for trading at future dates, transaction costs, and other assumptions should be analyzed by the actuary as to whether the cash flow model permits hedging strategies that make money in some scenarios without losing a reasonable amount in some other scenarios. This includes, but is not limited to:

1) hedging strategies with no initial investment that never lose money in any scenario and in some scenarios make money; or
2) hedging strategies that with a given amount of initial money never make less than accumulation at the one-period risk free rates in any scenario but make more than this in one or more scenarios.

If the cash flow model allows for such situations, the actuary should be satisfied that the results do not materially rely directly or indirectly on the use of such strategies. In addition, the actuary should disclose the situations and provide supporting documentation as to why the actuary believes the situations are not material for determining the Reported Amount. If the results do materially rely directly or indirectly on the use of such strategies, the strategies may not be used to reduce the Reported Amount otherwise calculated.

In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. If there are substantial discrepancies, the actuary should disclose the material discrepancies and provide supporting documentation as to why the model-based prices are appropriate for determining the Reported Amount. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when Scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the Scenario is one of the determinants of prices for trading in that Scenario, then that model should approximate actual historic prices in similar circumstances in history.

E. Hedging Certification and Documentation

The actuary must provide a certification that the values for E, CTE Amount (adjusted) and CTE Amount (best efforts) were calculated using the process defined in the report and other applicable regulations and guidelines, and the assumptions used in the calculations were reasonable for the purpose of determining the Reported Amount. The actuary must document the method(s) and assumptions (including data) used to determine CTE Amount (adjusted) and CTE Amount (best efforts), and maintain adequate documentation as to the methods, procedures and assumptions used to determine the value of E.

The actuary must provide a certification as to whether the Clearly Defined Hedging Strategy is fully incorporated into the cash flow model and any supplementary analysis of the impact of the

hedging strategy on the Reported Amount. The actuary must document the extent to which elements of the hedging strategy (e.g., time between portfolio rebalancing) are not fully incorporated into the cash flow model and any supplementary analysis to determine the impact, if any. In addition, the actuary must provide a certification and maintain documentation to support the certification that the hedging strategy designated as the Clearly Defined Hedging Strategy meets the requirements of a Clearly Defined Hedging Strategy including that the implementation of the hedging strategy in the stochastic cash flow model and any supplementary analysis does not include knowledge of events that occur after any action dictated by the hedging strategy (i.e. the model cannot use information about the future that would not be known in actual practice.).

A financial officer of the company (e.g., Chief Financial Officer, Treasurer or Chief Investment Officer) or a person designated by them who has direct or indirect supervisory authority over the actual trading of assets and derivatives must certify that the hedging strategy meets the definition of a Clearly Defined Hedging Strategy and that the Clearly Defined Hedging Strategy is the hedging strategy being used by the company in its actual day-to-day risk mitigation efforts.

Section 8. Guidance and Requirements for Reflecting Revenue Sharing Assumptions

A. Requirements

1. Projections may include income from projected future Revenue Sharing (as defined in this Report**)** net of applicable projected expenses ("Net Revenue Sharing Income") if the following requirements are met**:**

   a. The Net Revenue Sharing Income is received and controlled by the company[1];

   b. Signed contractual agreement or agreements are in place as of the Valuation Date and support the current payment of the Net Revenue Sharing Income; and

   c. The Net Revenue Sharing Income is not already accounted for directly or indirectly as a company asset.

B. Revenue Sharing Amounts

The amount of Net Revenue Sharing Income to be used shall reflect the actuary's assessment of factors that include but are not limited to the following (not all of these factors will necessarily be present in all situations)

a. The terms and limitations of the agreement(s), including anticipated revenue, associated expenses and any contingent payments incurred or made by either the company or the entity providing the net Revenue Sharing as part of the agreement(s);

b. The relationship between the company and the entity providing the Net Revenue Sharing Income that might affect the likelihood of payment and the level of expenses;

c. The benefits and risks to both the company and the entity paying the Net Revenue Sharing Income of continuing the arrangement;

d. The likelihood that the company will collect the Net Revenue Sharing Income during the term(s) of the agreement(s) and the likelihood of continuing to receive future revenue after the agreement(s) has ended;

e. The ability of the company to replace the services provided to it by the entity providing the Net Revenue Sharing Income or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide;

f. The ability of the entity providing the Net Revenue Sharing Income to replace the services provided to it by the company or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide; or

g. All expenses required or assumed to be incurred by the company in conjunction with the arrangement providing the Net Revenue Sharing Income, as well as any expenses assumed to be incurred by the company in conjunction with the assumed replacement of the services provided to it (as discussed in subsection (e) above) shall be included in the projections as a company expense. In addition, expenses incurred by either the entity providing the Net Revenue Sharing Income or an affiliate of the company shall be included in the applicable expenses that reduce the Net Revenue Sharing Income.

C. Margins

[1] As in other sections of this report, the term "the company" is used exclusively as a reference to the insurance company writing the business falling under the scope of the Report. The term "entity providing the Net Revenue Sharing Income" is self-explanatory and is used consistently in this subsection.

1. The amount of projected Net Revenue Sharing Income shall also reflect a Margin (which decreases the assumed Net Revenue Sharing Income) directly related to the uncertainty of the revenue, including uncertainty regarding the creditworthiness of the provider of the Net Revenue Sharing Income. The greater the uncertainty, the larger the Margin. [2]
2. To the extent the agreements(s) guarantees[3] the payment of Net Revenue Sharing Income to the company, the net revenue may be included in full over the period for which it is guaranteed.[4]

D. Additional Requirements

The actuary is responsible for reviewing the revenue sharing agreements, verifying compliance with these requirements, and documenting the rationale for any source of Net Revenue Sharing Income used in the projections.

[2] Because the uncertainty would be expected to increase over time, it may be necessary to decrease the revenue by larger amounts in later projection periods.

[3] Provisions such as one that gives the entity paying the Net Revenue Sharing Income the option to stop or change the level of income paid would prevent the income from being guaranteed. However, if such an option becomes available only at a future point in time, and the revenue up to that time is guaranteed, the income is considered guaranteed up to the time the option first becomes available.

[4] If the agreement allows the company to unilaterally take control of the underlying fund fees that ultimately result in the Net Revenue Sharing Income then the revenue is considered guaranteed up until the time at which the company can take such control. Since it is unknown whether the company can perform the services associated with the revenue sharing arrangement at the same expense level, it is presumed that expenses will be higher in this situation. Therefore, the Net Revenue Sharing Income shall be reduced to account for any actual or assumed additional expenses.

Section 9. Certification and Documentation Requirements

A. Certification

1. A Qualified Actuary shall provide a certification that the Reported Amount was calculated in a manner that meets the requirements of this report and complies with all applicable Actuarial Standards of Practice. The certification shall consist of at least the following:

   a. A paragraph identifying the Qualified Actuary and his or her qualifications;

   b. A scope paragraph identifying the statement values of the products included in the certification and the methodology used for those statement values (e.g. Stochastic Amount, ~~Exclusion~~Alternative Amount);

   c. A reliance paragraph describing those areas, if any, where the certifying actuary has relied on other experts. A reliance statement from each of those relied upon should accompany the certification. The reliance statements should note the information being provided and a statement as to the accuracy, completeness or reasonableness, as applicable, of the information;

   d. A paragraph certifying that required capital was determined in accordance with the principles and requirements of the NAIC RBC Instructions;

   e. A paragraph certifying that where the assumptions are not prescribed, the assumptions used for these calculations are Prudent ~~Best~~ Estimate Assumptions for the products, scenarios, and purpose being tested;

   f. A paragraph disclosing all material changes in the model or assumptions from that used previously and the estimated impact of such changes; and

   g. A paragraph stating that the Qualified Actuary is not opining on the adequacy of the company's surplus or its future financial condition.

2. A ~~financial~~ duly authorized financial officer of the company (e.g., Chief Financial Officer, Treasurer, or Chief Investment Officer) or a~~n~~ duly authorized person designated by them who has direct or indirect supervisory authority over the actual trading of assets and derivatives must certify that the Clearly Defined Hedging Strategy is the hedging strategy being used by the company in its actual day-to-day risk mitigation efforts**.**

3. All certifications shall be filed with the annual Risk-Based Capital return filing.

B. Actuarial Report

1. A Qualified Actuary shall prepare an Actuarial Report each year that documents all material decisions made, and information used, to support the certification, including assumptions, margins and methodologies used to calculate the Reported Amount. The Actuarial Report will be confidential, to the extent permitted by law, and available to regulators upon request, as authorized by the company or as required by law**.**

2. The Actuarial Report shall include:

   a. The Stochastic Amount, including the distribution of the Scenario Amounts and the result of applying the CTE risk level.

   b. The ~~Exclusion~~Alternative Amount, if any, and any necessary demonstration regarding the determination of the ~~Exclusion~~Alternative Amount.

   c. Documentation of the key modeling decisions made by the Qualified Actuary, including:

i. Assets:
   (1.) Description including type and quality
   (2.) Investment & disinvestment assumptions
   (3.) Assets used at the start of the projection
   (4.) Source of asset data
   (5.) Asset valuation basis
   (6.) Documentation of assumptions:
      (a) Default costs
      (b) Prepayment functions
      (c) Market value determination
      (d) Yield on assets acquired
      (e) Mapping and grouping of funds to modeled asset classes

ii. Liabilities
   (1.) Product Descriptions
   (2.) Source of Liabilities
   (3.) Grouping of Contracts
   (4.) Working Reserve
   (5.) Investment Reserves
   (6.) Reinsurance
   (7.) Tax Adjustment
   (8.) Documentation of assumptions to include:
      (a) Premium Pattern, Persistency and Allocation
      (b) Withdrawal, Lapse and Termination Rates
      (c) Non-guaranteed Elements
      (d) Expenses
      (e) Investment / Fund Choice
      (f) Asset Allocation, Rebalancing and Transfer Assumptions
      (g) Revenue Sharing
      (h) Federal Income Tax

iii. Hedging Strategy
   (1.) Documentation of strategy
   (2.) Identification of current positions
   (3.) Description on how strategy was incorporated into modeling:
      (a) basis risk
      (b) gap risk
      (c) price risk
      (d) assumption risk
   (4.) Document the methods and criterion used to estimate the *a priori* effectiveness of the hedging strategy

iv. Scenarios
   (1.) Description of scenario generation for interest rates and equity returns
   (2.) Disclose the number "n" of scenarios used and the methods used to determine the sampling error of the CTE (90) statistic when using "n" scenarios.
   (3.) Time Step of Model (e.g. Monthly, Quarterly, Annual)
   (4.) Correlation of equity and / or fund returns
   (5.) Processes to ensure scenarios meet calibration requirements
   (6.) Support for mapping variable accounts to proxy funds

v. Other

(1.) Description of and support for any simplified approaches in the Cash Flow Models.

d. Description and results of material sensitivity tests performed.

e. A description of the internal controls and procedures used to ensure the appropriateness of the actuary's judgment when permitted by this report and applicable Actuarial Standards of Practice.

f. A list of the key risk measurement tracking tools that the company uses as an early warning of changes in experience between Valuation Dates.

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

[~~Drafting~~ note: The timing of when the Executive Summary is to be provided will be determined by the NAIC.]

C. This report requires a Qualified Actuary to make various determinations, verifications and certifications. The company shall provide the Qualified Actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in this report and responsibilities arising from applicable Actuarial Standards of Practice.

D. Except in cases of fraud or willful misconduct, the Qualified Actuary shall not be liable for damages to any person (other than the insurance company and the commissioner) for any act, error, omission, decision or conduct with respect to the actuary's opinion, to the extent permitted by law.

E. The qualifications to be considered a "Qualified Actuary" under this report are**:**

1. Be a member in good standing of the American Academy of Actuaries;
2. Be familiar with all appropriate standards of practice that apply to principles-based approaches;
3. Not have been found by the commissioner, following appropriate notice and hearing to have:
   a. Violated any provision of, or any obligation imposed by, the insurance law or other law in the course of his or her dealings as a Qualified Actuary or an Appointed Actuary;
   b. Been found guilty of fraudulent or dishonest practices;
   c. Demonstrated his or her incompetence, lack of cooperation, or untrustworthiness to act as a Qualified Actuary; or
   d. Resigned or been removed as a Qualified Actuary within the past five (5) years as a result of acts or omissions indicated in any adverse report on examination or as a result of a failure to adhere to generally acceptable actuarial standards;
4. Not fail to notify the commissioner of any action taken by a commissioner of another state similar to that under Paragraph (3) above.

[~~Drafting~~ Note: it needs to be determined whether the Qualified Actuary must be appointed by, or be delegated authority by, the Board of Directors of the company]