~~**Report of the American Academy of Actuaries' C3 Life and Annuity Capital Work Group**~~

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~~**Life Risk Based Capital Working Group**~~

~~**September 2009**~~

~~The American Academy of Actuaries is a 16,000-member professional association whose mission is to serve the public on behalf of the U.S. actuarial profession. The Academy assists public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy~~

Certain Changes from the March 2009 C3 Life and Annuity Capital Work Group Report

(1).Scope. Scope language in prior reports referred to individual life polices. The language has been clarified to refer to all life insurance policies as the proposed approach is equally applicable and appropriate to both individual and group life products.

(2).Adjustment for existing RBC factor amounts. Placement of the language regarding adjustment to the C3 amount for the factor-based RBC cov4T3 Tw(ba)-7.7(sefactonarkesl.08 6kTtilit) facy riske reTD-0.0180.030.1396 T328(ba)

C3 Requirements for Life Products

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Section 1.~~Background~~Summary of Required Appproach

~~The C3 Life and Annuity Capital Work Group (C3WG) was formed in June 2008 as a work group of the American Academy of Actuaries' Life Capital Adequacy Subcommittee (LCAS). C3WG represents the merger of the American Academy of Actuaries' Life Capital Work Group (LCWG), originally charged with reviewing and evaluating 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 principle based reserving approach, and the American Academy of Actuaries' Life Capital Work Group (ACWG), similarly charged with respect to annuity products.~~

~~C3WG will draw resources from and work with the LCAS, the Life Reserves Wor~~k Group (LRWG) and

Recognizing the desire, in certain situations, to utilize approaches that are simpler than the process used to quantify the Stochastic Amount, simplified methods are included in this recommendation subject to a minimum based on the current C3 factors for life insurance products. For policies deemed not to have material tail risk, this recommendation permits the use of the current C3 factors. Additionally, recognizing that there may be some liabilities not included in a company's models, an amount for non-modeled liabilities is included as an alternative. In determining the total C3 requirement, the Total Asset Requirement is the greater of (a) and (b), where (a) is equal to the sum over all Business Segments of the Stochastic Amount, Alternative Amount, Factor-~~b~~Based ~~a~~A

Section 2. Purpose

A. The purpose of this report is to prescribe~~recommend~~ a principle-based approach (PBA) to the determination of the C3 component and ~~a~~the portion of the C1 component of Risk-Based Capital for life products attributed to equities to the extent such equities are captured in the determination of C3.

B. A principle-based approach is one that:

1. Captures the benefits and guarantees associated with the contracts and their identifiable, quantifiable and material risks, including the risks represented in the tails of the distribution 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, risk analysis methods, and models and management techniques that are consistent with those utilized within the company's overall risk assessment process. Risk and risk factors explicitly or implicitly included in the company's risk assessment and evaluation processes will be included in the risk analysis and cash flow

Section 3. Scope

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

B. Risk-Based Capital requirements for 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

C3WG had a number of thoughts in mind when these 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 sometime in the future). As a result, the method has to be broad and general enough to cover the 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.

The only assumptions for which stochastic processes were considered are those for interest rates and equity returns. All other assumptions which are neither stochastically determined nor prescribed 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 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 consit 0TDeenrt

Each of these alternative calculations has issues in terms of integrating

Section 5. Definitions

The following terms shall have the indicated meanings for purposes of this report:

A. A.edness and 8(ll)-net i.254429.89020cat14or p2 Tc0109 purp 1102

L. Derivative Program. A program to buy or sell one or more Derivative Instruments or open or close hedging positions to achieve a specific objective. Both hedging and non-hedging programs (e.g., for replication or income generation objectives) are included in this definition.

M. Discount Rates.

conservative sample developed by the company for the purpose of calculating the Stochastic Amount for policies within the scope of this report.

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

FF. Qualified Actuary. An actuary who meets the qualifications as defined in Section 11 (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".

GG. Risk Factor. An aspect of future experience that is not fully predictable on the Valuation Date.

HH. Reported Amount. The minimum amount as of the Valuation Date for the policies falling within the scope of this report using a principle-based approach. The Reported Amount equals the Total Asset Requirement less the statutory value on the valuation date of the liabilities included in the determination of the Total Asset Requirement.

II. 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.

JJ. Scenario. A sequence of outcomes used in the cash flow model, such as a path of future interest rates, equity performance, or separate account fund performance

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

LL. Starting Assets. The assets assigned to a Business Segment prior to the calculation of the Reported Amount, and valued as of the Projection Start Date.

MM. Stochastic Amount. The amount determined by applying a prescribed CTE level to the distribution of Scenario Amounts over a broad range of stochastically generated Scenarios calculated using Prudent Estimate Assumptions for all assumptions not stochastically modeled.

NN. Stochastic Exclusion Test. A test to determine whether the block of policies being tested is considered to have material tail risk arising from interest rate movements or equity performance. Passing the test allows the company to exclude the block of policies from the stochastic modeling calculation, and instead, use the current C3 RBC factors in determining the C3 amount on that block.

OO. Total Asset Requirement. The minimum amount as of the Valuation Date for the policies falling within the scope of this report using a principle-based approach and equals the greater of (a) and (b), where (a) is equal to the sum over all Business Segments of the Stochastic Amount, Alternative Amount or Factor-based Amount for each Business Segment or combination of Business Segments, plus any Non- modeled Amount related to each segment or combination of segments, and (b) is equal to the sum of the current factor based amount and corresponding reserve amount on the valuation date for all of the Company's liabilities falling within the scope of this report.

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

QQ. 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 and asset adequacy analysis, using the tool of 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 preferred. However, an exception to the stochastic modeling requirement can be made if certain conditions are met, as described in Sections 6(G)(2) and 6(G)(3) below.

2. This report 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 net cash flows using the methods 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~~three 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 Estimate Assumptions for all assumptions not stochastically modeled, and then applying a prescribed Conditional Tail Expectation level.

5. It will not be necessary to determine the Stochastic Amount for groups of policies where such policies are deemed not have material tail risk by means of passing the Stochastic Exclusion Test detailed in Section 6(G)(2). For groups of policies passing the Stochastic Exclusion Test, the C3 amount may be determined as the Factor-based Amount as described in section 6I.

6. A company may elect to exclude certain policies from the stochastic modeling requirement if certain conditions are met (as described in Section 6(G)(3) below.) The Alternative Amount is otherwise determined for those policies not covered by the Factor-based Amount and otherwise excluded from the stochastic modeling requirement.

7. Recognizing that there may be some liabilities not included in a company's models, an amount for non-modeled liabilities should be included in the Total Asset Requirement determined.

8. The Total Asset Requirement is the greater of (a) and (b), where (a) is equal to the sum over all Business Segments of the Stochastic Amount, Ar,coer

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Assumption for the Risk Factor. The Prudent Estimate Assumption for each Risk Factor shall be:

a.

c. 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 Business 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 Business 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 and guaranteed separate account business (such as cost of insurance 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. All material benefits paid to policyholders, including but not limited to, death claims, surrender benefits, and withdrawal benefits, reflecting the impact of all material guarantees will be included in the cash flow projection.

c. 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, expenses, etc.

d. Insurance company expenses and taxes (including overhead expenses), commissions, fund expenses, contractual fees and charges are to be reflected on a basis consistent with -7.8(h)-34 -1.ues 1(w)131(wo0.00a4hv131(woA wit)-7.c c)ompany expenses and ta

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

and contractual cash flow provisions for which the resulting purchase yield appropriately reflects the then-current U.S. Treasury interest rate curve plus 4% of the appropriate U.S. Treasury interest rate curve plus .25%.

sensitivity to projection frequency should be validated by testing wherein the actuary should ensure that the use of a more frequent (i.e., shorter) timestep does not materially increase capital requirements. A more frequent time increment should always be used

~~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 an amount no less than 98% and no greater than 102% of the statutory value of the reserve and other liabilities on the policies being valued at the Projection Start Date. All starting assets must be in the company's asset portfolios at the projection start date and be normally associated with supporting the Business Segment being modeled. Assets shall be valued consistently with their annual statement values. Starting assets shall include:

   a. Where assets supporting policies are held in Separate Accounts, the entire value of the assets in the Separate Accounts.

   b. The balance of any policy loans outstanding.

   c. An amount of assets in the General Account and guaranteed Separate Account such

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. 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

~~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.~~

10. Modeling Federal Income Tax. The projections in support

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 C3 risks. 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 Exclusion Test

It will not be necessary to perform stochastic modeling for groups of policies where such policies are deemed not have material tail risk by means of passing the Stochastic Exclusion Test detailed in Section 10. For groups of policies passing the Stochastic Exclusion Test the C3 amount may continue to be determined as the Factor-based Amount as described in section 6I below.

3. Stochastic Modeling Exclusion: The actuary may elect to exclude certain groups of policies from the stochastic modeling requirement upon demonstration that the Alternative Amount for those policies will adequately provide for all material C3 risks underlying such policies. Policies that do not pass the Stochastic Exclusion Test are still eligible to use this stochastic modeling exclusion.

4. Stochastic Amount Calculation Description: The Stochastic Amount is determined using the following steps:
   a. Determine policy grouping as defined in Section 6.G.5;
   b. Determine Prudent Estimate Assumptions as defined in Section 6.B above;
   c. Project cash flows for each Business Segment for each Scenario as described in 6 C, D, and E;
   d. Calculate the path of Discount Rates for each Business Segment for each Scenario as described in 6 F;
   e. Calculate the Scenario Amount for each Scenario using the methodology described in 6.G.6; and;
   f. Calculate the Stochastic Amount as described in 6.G.7, below.

5. Grouping of Policies for Modeling: Projections may be performed for each policy in ing the r57upi

Working Reserve is equal to the cash surrender value for purposes of this calculation. For policies having no cash surrender value the Working Reserve is equal to zero;

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 Segment that was calculated in step 6.a.(2) above. The discounted value shall be calculated using the path of Discount Rates for the Business 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 Segments; and
5. Determine the Scenario Amount as the sum of (a) the statement value of the starting assets across Business Segments and (b) the maximum of the values calculated in step (4) above. Note that the amount in (b) herein can be either positive or negative.

The Actuary shall consider making an adjustment to the Scenario Amount for the difference between the modeled and actual tax reserves at the beginning of the projection, if necessary.

In the case where actual tax reserves are higher (lower) than the modeled tax reserve at the beginning of the projection period, the modeled tax expense may be understated (overstated) over the projection period. If a tax adjustment is required the Total Asset Requirement must be increased (decreased) on an approximate basis to correct for the understatement (overstatement) of modeled tax expense. A tax adjustment is more likely to be required where tax reserves are not projected directly; for example, where projected tax reserves are approximately modeled as cash values or other approximations.

An acceptable adjustment to the Scenario Amount may be calculated 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 m ar10.2(e)-828ge28.1(ati)84.1(o)-36(n (o)-36(fr10.2 (o)-3
tscenarios used (men.6(s.)TJ-10.0296

The Stochastic Amount may be reduced, but not to less than zero, by the factor-based RBC covering market volatility risk of equity assets used in the determination of the Stochastic Amount. The amount of such adjustment and its derivation is to be documented in the Actuarial Report. The actuary who certifies the RBC amount must be reasonably certain that the risks that the factor-based RBC are attempting to measure are

2. The Factor-based Amount will be determined as the sum of the following amounts:

c. In other situations or for other products both the interest rate risk and market risk may form a material portion of the Reported Amount. In this case allocating the Reported Amount to the component with the least covariance effect would be conservative and acceptable. Otherwise, the actuary must develop and document an appropriate basis for allocating the Reported Amount.

M. Treatment of Non-Guaranteed Elements

1.

Section 7. Modeling of Derivative Instruments

A. General Considerations

The appropriate costs and benefits of Derivative 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.

The appropriate costs and benefits of anticipated future Derivative Instrument transactions ~~associated with the execution of a Clearly Defined Hedging Strategy~~ shall ~~also~~not be included in the projections. ~~if a company is following a Clearly Defined Hedging Strategy and the hedging strategy meets the requirements as defined in Section 6.E.~~

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

C. Specific Conditions and Requirements

As part of the process of choosing a methodology and assumptions for estimating the future effectiveness of the current Derivative Program (including currently held Derivative Instruments) 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 Derivative Program, 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 (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

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Section 8. Revenue Sharing Assumptions

A. Requirements

1. Projections may include income from projected future Revenue Sharing (as defined in this Report)

used consistently in this subsection.

A. General Considerations

1. The terms "reinsurance" and "reinsurer" in this Section include retrocession and retrocessionaire respectively.

2. The assumptions that are used by a ceding company to determine the Reported Amount for policies that are ceded to a reinsurer shall be appropriate for the ceding company and need not be the same as the assumptions used by the assuming company to determine the Reported Amount for these policies.

3. One party of a reinsurance transaction may rely on elements of the Reported Amount calculations performed by the other party. However, appropriate adjustments to these calculations must be made, if necessary, to reflect the circumstances of the first party.

4. A reinsurance agreement or amendment shall be considered in force and included in calculating the Reported Amount if:

   a. The agreement or amendment has been duly executed by both parties no later than the "as of date" of the financial statement; or

   b. A binding letter of intent has been duly executed by both parties no later than the "as of date" of the financial statement unless no final agreement or amendment has been executed more than 90 days after the execution date of the letter of intent; or

   c. If neither (a) nor (b), but the company has determined after review of the relevant facts and circumstances that it is likely to have legal obligations under the agreement or amendment and including the agreement or amendment would result in a higher Reported Amount.

5. There are certain provisions of reinsurance agreements where a single deterministic valuation assumption for the related risk factor or factors will not adequately capture the risk. Examples of such provisions include stop loss reinsurance and maximum limits on benefits receivable. For these features, the company shall make provision for these risk factors by either:

   a. Stochastically modeling the risk factor(s) directly in the cash flow model when calculating the Stochastic Amount, or

   b. Performing a separate analysis outside the cash flow model to quantify the impact on reinsurance cash flows to and from the company. The results of this analysis shall be used to adjust prudent estimate assumptions or to determine an amount to adjust the Stochastic Amount to adequately make provision for the risks of the reinsurance feature(s).

B. Reinsurance Ceded

1. Cash Flows for Reinsurance Ceded. The cash flows used in calculating the Stochastic Amount shall include the effect of cash flows received from or paid to reinsurers under the terms of ceded reinsurance agreements if the reinsurance agreements are appropriate to the business and not merely constructed to exploit foreknowledge of the components of the required methodology.

2. Assumptions for Reinsurance Ceded. The assumptions used to project cash flows to and from reinsurers shall be consistent with other assumptions used by the ceding company in calculating the Reported Amount for the reinsured policies, and reflect the terms of the reinsurance agreement.

C. Reinsurance Assumed

1. Cash Flows for Reinsurance Assumed. The cash flows used in calculating the Stochastic Amount shall include the effect of cash flows received from and paid to ceding companies under the terms of assumed reinsurance agreements if the reinsurance agreements are appropriate to the business and not merely constructed to exploit foreknowledge of the components of the required methodology.
2. Assumptions for Reinsurance Assumed. The assumptions used to estimate cash flows to or from the ceding company should reflect the reinsurer's (i.e. the assuming company's) experience for the business segment to which the reinsured policies belong, and should reflect the terms of the reinsurance agreement.

D. Reinsurance Assumptions

1. Actions by Counterparty

a Knowledgeable counterparties. Assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and thus likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. Items that should be considered as Non-guaranteed Elements in reinsurance cash flows shall include but not be limited to

(i). Any limits placed upon either party's ability to exercise contractual changes in the treaty terms;

(ii). The usual and customary practices associated with such agreements,

(iii). Past practices by the parties concerning the changing of terms in an economic environment similar to that projected;

(iv). The ability of the direct-writing company to modify the terms of its policies in response to changes in terms from its reinsurers; and

(v). Actions that might be taken by a party if the counterparty is in financial difficulty.

b Consideration of ceding company actions. The assumptions that the ceding company uses to determine the Reported Amount shall take into account any actions that the ceding company or assuming company and, if different, the direct-writing company have taken or are likely to take that could affect the expected cash flows of the reinsured business. Examples of actions that could be taken by the direct-writing company include, but are not limited to: (i) internal replacement programs or special underwriting programs, both of which could change expected mortality rates, and (ii) changes in Non-guaranteed Elements in the reinsured policies, which could affect mortality, policyholder behavior, and possibly expense and investment assumptions. Examples of actions that could be taken by the ceding company include, but are not limited to: (i) the exercise of contractual options in a reinsurance agreement to influence the setting of Non-guaranteed Elements in the reinsured policies, and (ii) the ability to participate in claim decisions. For actions taken by the ceding company, or, where different, the direct-writing company, assumptions will be set in a manner consistent with Section 6B. Note that these assumptions are in addition

business. Examples of such actions include, but are not limited to, changes to the current scale of reinsurance premiums and changes to expense allowances. The ability of an assuming company to change such rates or allowances in a reinsurance

agreement may be thought of as comparable to the ability of a direct-writing

If the company concludes that modeling is unnecessary, the company should document the testing and logic leading to that conclusion.

Note: Special considerations for modified coinsurance. Although the modco reserve is called a reserve, it is substantively different from other reserves. It is a fixed liability from the ceding company to the reinsurer in an exact amount, rather than an estimate of a future obligation. The modco reserve is analogous to a deposit. This concept is clearer in the economically identical situation of funds withheld. Therefore, the value of the modified coinsurance reserve will generally not have to be determined by modeling. However, the projected modified coinsurance interest may have to be modeled. In many cases, the modified coinsurance interest is determined by the investment earnings of an underlying asset portfolio, which in some cases will be a segregated asset portfolio or in others the ceding company's general account. Some agreements may use a rate not tied to a specific portfolio.

3. Credit Risk
   a.
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The assumptions used to determine the Reported Amount shall include the effect on cash flows resulting from such representations or warranties when possible. For example, if the ceding company warrants that the ceded reinsurance will be profitable to the assuming company, cash flows under scenarios that would otherwise result in a loss to the assuming company must be adjusted to reflect the warranty.

If the impact of such a representation or warranty is not possible to include in projected cash flows, the company should determine the legal consequence of breaching the representation or warranty under the agreement. The Reported Amount is the greater of the calculation assuming the breach of the representation or warranty has occurred, or the calculation assuming the breach has not occurred. For example, if the ceding company warrants that it will remain solvent during the term of the agreement, and the consequence of a breach will be immediate termination of the reinsurance, such immediate termination shall be assumed in the model if doing so will decrease the company's surplus.

2. A reinsurance agreement that does not contain provisions:

a. Acknowledging the entire agreement between the parties with respect to the business being reinsured, or

b. That any changes to the agreement shall be null and void unless made by amendment to the agreement signed by both parties.

In this case, each company shall use assumptions for such

benefits and expenses for the policies, adjusted for reinsurance as appropriate to achieve consistency between the numerator and denominator.

C. Reserve Adequacy Certification Requirement

level shock over 5 years assuming monthly shocks, the sum of the 60 shocks must be 1.28 times the square root of 60. The test scenarios are described below:

1. Scenario 1 – Pop up, high equity

10. Scenario 10 – Inverted yield curves

Zero shocks to long term rates and equities. Shocks to the spread between short and long rates that are consistently in the same direction for each three-year period. The shocks for the first three-year period are in the direction of reducing the spread (usually causing an inverted yield curve). Shocks for each subsequent three year period alternate in direction.

11. Scenario 11 – Volatile equity returns

Zero shocks to interest rates. Shocks to equity returns that are consistently in the same direction for each two-year period, and then switch directions.

12. Scenario 12 – Deterministic scenario for valuation

Uniform downward shocks each month for 20 years, sufficient to get down to the 80% point on the distribution of 20 year shocks. After 20 years, shocks are at a level that keeps the cumulative shock at the 80% level (or the 20% level, depending on how you look at it).

13. Scenario 13 – Delayed pop up, high e.7()8sTw[three-y 523.8)12.74(t)0.47998 refBT10.4768 0 0 10.02 29316(o25.

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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 Alternative Amount, if any, and any necessary demonstration regarding the determination of the Alternative Amount.

c. The Factor-based Amount, if any, including the Stochastic Exclusion Test Scenario Amount and the test ratio.

d. The Non-modeled amount, if any.

e. Documentation of the key modeling decisions made by the Qualified Actuary, including but not limited to:

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.) Investment Reserves
(5.) Reinsurance
(6.) Tax Adjustment
(7.) 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. Derivative Program

(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 Derivative Program

iv. Scenarios

~~(1.)~~ Description of scenario generation for interest rates and equity returns

~~(1.)~~(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)

~~(3.)~~(4.) Correlation of equity and / or fund returns

~~(4.)~~(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.

~~(1.)~~(2.) Basis for decision to aggregate Business Segments if aggregation is done.

~~(2.)~~(3.) Description of the use of data prior to the valuation date.

f. Description and results of material sensitivity tests performed.

g. 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.

h. 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.

[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 of the American Academy of Actuaries qualified under the U.S. Qualification Standards;
2. Be familiar with all appropriate standards of practice that apply to principle-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

Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure

Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure
AVR/IMR	No specified treatment	Consistent with cash flow testing	May be included	Pre-tax IMR is incl.3(3)10.2(P)75.1(ded)

Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure
Treatment of Anticipated Future Derivatives	Future Hedges limited to CDHS. Limitations on inclusion through CTE adjustment process.	Future Hedges limited to CDHS. Limitations on inclusion through CTE adjustment process.	Includes the appropriate costs and benefits of anticipated future derivative instrument transactions associated with the execution of a CDHS. Also includes the appropriate costs and benefits of anticipated future derivative instrument transactions associated with non-hedging derivative programs (e.g. replication, income generation) undertaken as part of the investment strategy supporting the policies provided they are normally modeled as part of the company's risk assessment and evaluation processes.	Section 7.J. - consistent with C3WG
Treatment of Revenue Sharing	Item 6, page 11 Actuarial Judgment	Limits on non-contractually guaranteed net revenue sharing.	Section 8 - consistent with C3P2	Section 9.I. - Consistent with C3WG. guarantee8.ef392m8oent83 1

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Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure
Prior Period Data / Timing of Calculations	Estimated value, based on data as of a date preceding year-end, permitted for year-end annual statement. Value for RBC electronic filing based on year-end data. Revised annual statement filing required if reported Authorized Control Level Risk-Based Capital for the company exceeds that printed in the annual statement by more than 5 percent, or if the reported Risk-Based Capital triggers regulatory action.	No Specification	Up to 6 months prior to valuation date permitted subject to appropriate adjustment for differences between “as-of” date and valuation date.	

Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure
Stochastic Scenarios	Pre-packaged scenarios; Proprietary Scenario generator subject to calibration	Pre-packaged scenarios; Proprietary Scenario generator subject to calibration	Pre-packaged scenarios; Proprietary Scenario generator subject to calibration; Proprietary Scenario Sets	Pre-packaged scenarios;
Number of scenarios	Actuarial Judgment	A1 .3) Actuarial Judgment (no material understatement of reserves)	Actuarial Judgment	Actuarial Judgment
Certification	General Certification Hedging Certification	Management Certification, Actuarial Certification, Certification of Alternative methodology and expense, revenue, fund mapping and product parameters, Certification of CDHS and E, CTE AmouiManag		

Calculation Item	C3 Phase II	AG 43 (VA CARVM)	C3WG Recommendation	NAIC VM-20 1/22/09 Exposure
Allocation	C3c RBC amount is to be combined with the $_{C1CS}$ component for covariance purposes. A provision for the interest rate risk of the guaranteed fixed fund option, if any, is to be calculated and combined with the current C3a component of the formula	Appendix 6, allocation of Aggregate Reserves	C3 amount will be allocated	