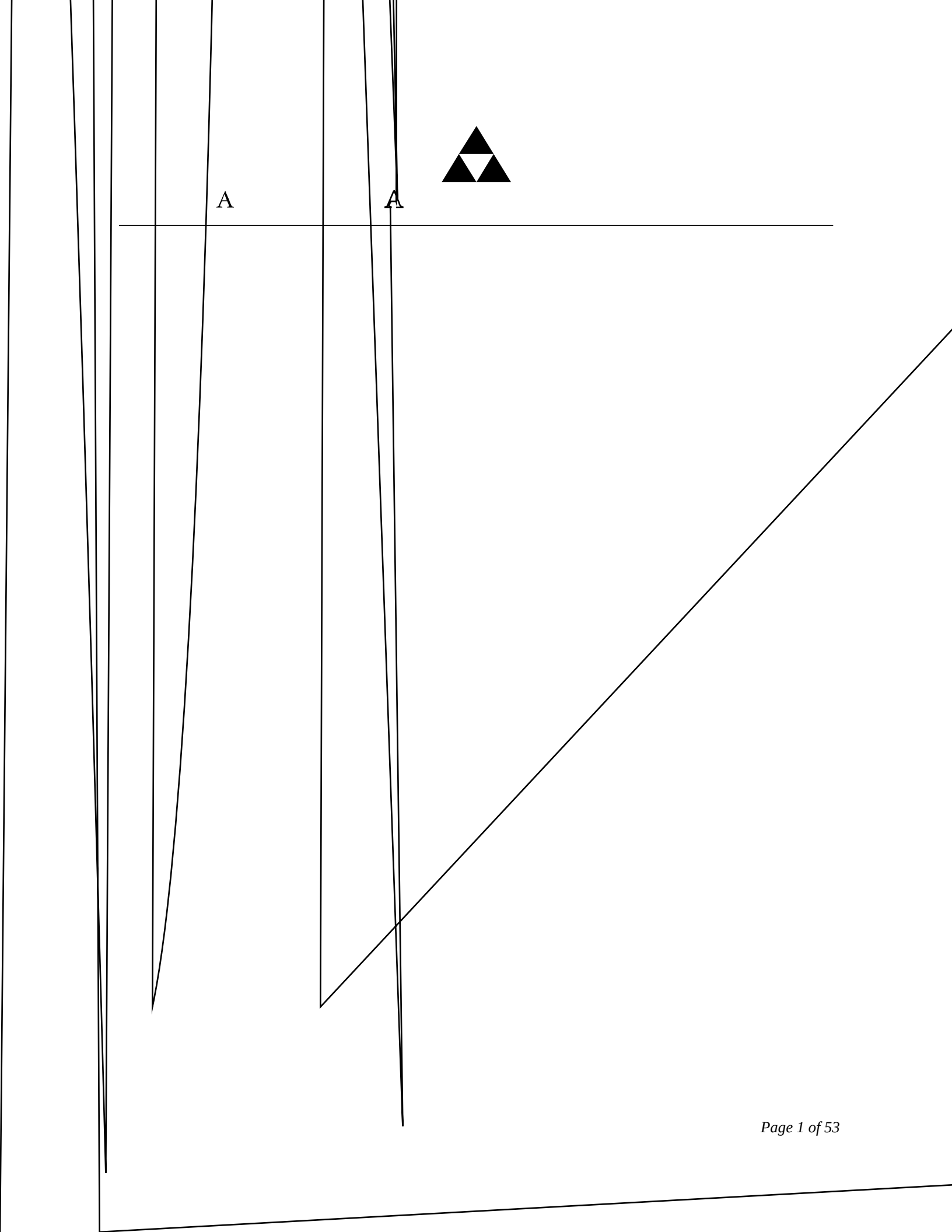
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Certain Changes from the March 2009 C3 Life and Annuity Capital Work Group Report

(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

C3 Requirements for Life Products

Table of Contents

Section 1. Background

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

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 -8(0co)-5A8 Tw 02221.1 2221ncluded as an alternative. In determining the total C3 requirement, the Total Asset Requirement is the sum of the Stochastic Amount, Alternative Amount, Factor-based amount and an amount for non-modeled -8(-5A8 Tw. The C3 com)12(pone)TJ-0.0005 Tc 0.3014 Tw 23.629 0 Td[nt for Risk-B)8(a

Section 2. Purpose

A. The purpose of this report is to recommend a prin

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

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.

The recommended approach of CTE90 less statutory liabilities is consistent with C3 Phase II in its determination of C3 risk. For policies valued under a principle-based approach, the statutory liabilities 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.

The issue of which of the alternative C3 calculations

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. The path of rates used to derive the present value.

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

O. Factor-based Amount. The portion of the Total Asset Requirement relating to liabilities which have been optionally subjected to and pass the Stochastic Exclusion Test.

P. 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).

Q. Liability-associated Derivative. A Derivative Program for which the Derivative Instrument cash flows are combined with liability cash flows within the Cash Flow Model.

R. Margin. The term "margin" means an amount included in the assumptions used to determine the Reported Amount that incorporates conservatism in the calculated value consistent with the requirements of the various sections of this report. It is intended to provide for estimation error and adverse deviation.

S. 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.

T. Net Asset Earned Rates. The path of earned rates reflecting the net general account portfolio rate in each projection interval (net of appropriate default costs and investment expenses).

U. Net Revenue Sharing Income. The amount of Revenue Sharing to be included in cashflow

conservative sample developed by the company

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 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 sum over all Business Segments of the Stochastic Amount, the Alternative Amount or the 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.
9. The Reported Amount is the Total Asset Requirement less the statutory value on the valuation date of the liabilities included in the determination of the Total Asset Requirement.

B. Prudent Estimate Assumptions

1. The actuary shall determine Prudent Estimate Assumptions used in the calculation for each Risk Factor that is not prescribed or is not stochastically modeled. The Prudent Estimate Assumptions shall vary from Scenario to Scenario as appropriate. A Prudent Estimate Assumption is developed by applying a Margin to the Anticipated Experience

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

a. Consistent with the 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; and
c. Supported by a documented process to reassess the appropriateness of the assumptions in future valuations.

2. Anticipated Experience Assumption. The actuary shall use company experience, if relevant and credible, to establish the Anticipated Experience Assumption for any Risk Factor. To the extent that company experience is not available or credible, the actuary

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.

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 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 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 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 reflect what a company expects to receive on the purchase and/or sale of securities and the strategies the company expects to utilize in managing its assets.

5. Frequency of Projection. Use of an annual cashflow frequency ("timestep") is generally acceptable for benefits/features that are not sensitive to projection frequency. The lack of

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 when the product features are sensitive to projection period frequency.

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 less 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; or

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

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

   [Note: The Proprietary 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.]

   d. Stochastic models developed by the co m

One Year Treasury Rates

Scenario / Year	1	2	3	4	5	6	7	8	9	10
1	1.99%	2.71%	2.71%	2.77%	2.93%	3.25%	2.87%	2.64%	2.40%	2.48%
2	1.38%	1.50%	1.86%	1.50%	1.67%	1.77%	1.56%	1.38%	1.32%	1.61%
3	1.71%	1.87%	1.81%	1.98%	1.65%	1.59%	1.37%	1.35%	1.33%	1.30%
4	1.93%	1.55%	1.69%	1.93%	1.83%	1.85%	1.80%	2.10%	2.27%	2.48%
5	1.96%	2.29%	2.41%	2.26%	2.01%	2.03%	2.27%	2.67%	2.70%	2.73%
6	1.87%	1.92%	1.72%	1.40%	1.68%	1.59%	1.49%	1.57%	1.42%	1.26%
7	1.91%	1.88%	2.16%	1.83%	1.91%	2.22%	2.24%	2.53%	2.74%	2.80%
8	1.67%	1.42%	1.51%	1.90%	1.80%	2.17%	2.10%	2.42%	2.55%	2.70%
9	2.00%	1.70%	2.03%	2.08%	2.02%	2.03%	2.06%	2.30%	1.93%	1.57%
10	1.94%	1.30%	1.52%	1.23%	1.44%	1.20%	1.23%	1.26%	1.48%	1.46%

105% of After-tax Discount Factors (taxes at 35%)

Scenario / Year	1	2	3	4	5	6	7	8	9	10
1	0.98658	0.96868	0.95106	0.93339	0.91508	0.89520	0.87801	0.86249	0.84860	0.83450
2	0.99065	0.98062	0.96834	0.95855	0.94777	0.93647	0.92663	0.91797	0.90975	0.89988
3	0.98850	0.97606	0.96413	0.95128	0.94066	0.93059	0.92196	0.91358	0.90536	0.89743
4	0.98703	0.97671	0.96555	0.95299	0.94123	0.92947	0.91817	0.90518	0.89136	0.87654
5	0.98677	0.97159	0.95587	0.94137	0.92865	0.91595	0.90196	0.88584	0.86982	0.85390
6	0.98742	0.97463	0.96331	0.95419	0.94336	0.93324	0.92387	0.91408	0.90529	0.89755
7	0.98711	0.97463	0.96051	0.94869	0.93650	0.92253	0.90864	0.89325	0.87683	0.86042
8	0.98873	0.97923	0.96925	0.95686	0.94526	0.93144	0.91830	0.90340	0.88793	0.87186
9	0.98652	0.97521	0.96187	0.94841	0.93549	0.92269	0.90990	0.89585	0.88419	0.87482
10	0.98694	0.97826	0.96819	0.96014	0.95078	0.94304	0.93517	0.92722	0.91793	0.90888

Re-ordered Highest to lowest within year

Scenario / Year	1	2	3	4	5	6	7	8	9	10
1	0.99065	0.98062	0.96925	0.96014	0.95078	0.94304	0.93517	0.92722	0.91793	0.90888
2	0.98873	0.97923	0.96834	0.95855	0.94777	0.93647	0.92663	0.91797	0.90975	0.89988
3	0.98850	0.97826	0.96819	0.95686	0.94526	0.93324	0.92387	0.91408	0.90536	0.89755
4	0.98742	0.97671	0.96555	0.95419	0.94336	0.93144	0.92196	0.91358	0.90529	0.89743
5	0.98711	0.97606	0.96413	0.95299	0.94123	0.93059	0.91830	0.90518	0.89136	0.87654
6	0.98703	0.97521	0.96331	0.95128	0.94066	0.92947	0.91817	0.90340	0.88793	0.87482
7	0.98694	0.97463	0.96187	0.94869	0.93650	0.92269	0.90990	0.89585	0.88419	0.87186
8	0.98677	0.97463	0.96051	0.94841	0.93549	0.92253	0.90864	0.89325	0.87683	0.86042
9	0.98658	0.97159	0.95587	0.94137	0.92865	0.91595	0.90196	0.88584	0.86982	0.85390
10	0.98652	0.96868	0.95106	0.93339	0.91508	0.89520	0.87801	0.86249	0.84860	0.83450

Discount rate = average of highest 10% within year

0.99065	**0.98062**	**0.96925**	**0.96014**	**0.95078**	**0.94304**	**0.93517**	**0.92722**	**0.91793**	**0.90888**

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 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.

6. Calculation of the Scenario Amount

   a. For each Scenario, the Scenario Amount for one or more Business Segments is determined by following steps (1) through (5) below:
      1. Calculate the net accumulated asset amount for each Business Segment at the end of each Projection Year and at the Projection Start Date, as described in 6.G.6.c below. Note that the net accumulated asset amount can be either positive or negative;
      2. Calculate the Accumulated Deficiency for each Business Segment at the end of each Projection Year and at the Projection Start Date for each Business Segment as the excess of the Working Reserve over the net accumulated asset amount at that duration. Note that the Accumulated Deficiency can be either positive or negative. The

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 uu45 0.1s Se1cie4

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 captured in the Stochastic Amount and that the amount of assets included in determination of the adjustment is not greater than the statutory value of such assets included in the models underlying the Stochastic Amount.

The Stochastic Amount may be reduced, but not to less than zero, by the factor-based RBC covering recoverability of expense allowances at the valuation date relating to liabilities being modeled. 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 captured in the Stochastic Amount and that the amount of expense allowances included in determination of the adjustment is not greater than the statutory value of such allowances relating to the liabilities included in the models underlying the Stochastic Amount.

To the extent the Stochastic Amount is based on data prior to the valuation date and the Total Adjusted Capital is less than 110 percent of the Company Action Level amount, it will be necessary to re-determine the Stochastic Amount subsequent to filing, using actual year-end data. If the re-determined RBC value exceeds that estimated earlier in the blanks filing by more than 5 percent, or if the actual value triggers regulatory action, a revised filing with the NAIC and the state of domicile is required by June 15; otherwise re-filing is permitted but not required.

H. The Alternative Amount

1. Purpose. The purpose of the Alternative Amount is to produce a C3 amount that is adequate to cover the C3 risks related to the product benefits and expenses, 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 H.

method among those currently in use in generally accepted actuarial standards of practice.

5. 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. 0.5% of the net balance of item (a) above less associated policy loans in the case of the company submitting an unqualified actuarial opinion based on asset adequacy testing; otherwise 0.75% of the net balance of item (a) above less associated policy loans.

[Note: the intent of the minimum amount is to provide regulator assurance that the C3

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. 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.
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 projected NGE for each Scenario, the actuary must take into

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 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 and should not be used in determining whether a company is permitted to use such instruments in any state or jurisdiction. To the extent these requirements conflict with any applicable law, the applicable law supersedes.

B. Background

The analysis of the impact of the Derivative Program on cash flows is typically performed using either one of two methods as described below. Although a Derivative Program would normally be

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

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.

D. Derivative Program Certification and Documentation

The actuary must provide a certification that the assumptions used in determining the impact of Derivative Programs on the calculations were reasonable for the purpose of determining the Reported Amount.

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 Derivative Program on the Reported Amount. The actuary must document the extent to which elements of the Derivative Program (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 Derivative Program designated as the Clearly Defined Hedging Strategy meets the requirements of a Clearly Defined Hedging Strategy. This includes certification that the implementation of the Derivative Program 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 Derivative Program modeled is the Derivative Program being used by the company in its actual day-to-day risk mitigation efforts.

Section 8. Revenue Sharing Assumptions

A. Requirements

1.

Section 9. Reinsurance

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

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.

agreement may be thought of as comparable to the ability of a direct-writing company to change Non-guaranteed Elements on policies. Thus, assumptions for such actions shall be set in a manner consistent with Section 6M. Appropriate assumptions for this option may depend on the scenario being tested (analogous to

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. Ceded Reinsurance. If a reinsurer is known to have a financial impairment, the company shall determine a Margin for default by the reinsurer. In cases without a known financial impairment, no mantfwrdeuthiseq5(w)-1(r)4(r)d

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 agreements that reflect the company's obligations under the agreement but do not reflect the obligations of the other party. For example, the ceding company will assume that it has outgoing cash flows for reinsurance premiums and other amounts due to the assuming company, but no incoming cash flows for benefit reimbursements or other amounts due from the assuming company.

3. A reinsurance agreement contains automatic or optional triggers relating to financial deterioration of one of the parties, such as a ratings downgrade or a declaration of conservatorship or insolvency.

In this case the assumptions used to determine the Reported Amount shall reflect a conservative valuation for the trigger. If the trigger results in the automatic occurrence of an event or the occurrence of the event at the option of the other party, the Reported Amount is the greatest of the calculation assuming the event caused by the trigger has occurred, or the calculation assuming the event has not occurred but will occur at some future date, or the calculation assuming the event has not occurred and will never occur. Examples of critical trigger events include termination, recapture, an increase in amounts due under the reinsurance agreement, and immediate payment of funds withheld.

C. Reserve Adequacy Certification Requirement

1. For those blocks of policies which pass the exclusion test and which the Qualified Actuary is able to certify that the statutory value on the valuation date of the policies included in the exclusion test are adequate, the C3 requirement may be determined as the Factor-based Amount as defined in section 10D.
2. The adequacy of a given block of policies is to be determined using the same methods and assumptions as applied to the block of policies in performing the annual Asset Adequacy Analysis.
3. The adequacy of a given block of policies is to be determined on a stand-alone basis for that block.
4. Certification and documentation are to be completed in accordance with Section 11.

D. Factor –based Amount

1. The Factor-based Amount is determined as the sum of the following amounts:
    a. The statutory reserve at the Valuation Date relating to policies which have been tested for exclusion by the Stochastic Exclusion Test ; and
    b. 0.5% of the net balance of item (a) above less associated policy loans in the case of the company submitting an unqualified actuarial opinion based on asset adequacy testing; otherwise 0.75% of the net balance of item (a) above less associated policy loans.

E. Stochastic Exclusion Test Timing

1. The exclusion test shall be carried out annually for a given block of policies to continue to qualify for the stochastic testing exclusion, and shall be done within the 12 month period prior to the valuation date. It would be expected that the timing of the test would be consistent from year to year and that the actuary would document both the current and prior year timing of the exclusion testing as well as rationale for any change in timing.
2. The actuary will certify that no material subsequent event has occurred after the date of the current year testing.

    To the extent a material subsequent event has occurred between the date of current year testing and the actual year-end, it will be necessary to re-perform the testing subsequent to filing, using actual year-end data. If the actual RBC value (Company Action Level RBC) exceeds that estimated earlier in the blanks filing by more than 5 percent, or if the actual value triggers regulatory action, a revised filing with the NAIC and the state of domicile is required by June 15; otherwise re-filing is permitted but not required.

3. For purposes of the above, a material subsequent event is one or more circumstances which, if reflected in the exclusion testing would be anticipated to result in a failure of the exclusion test.

F. Stochastic Exclusion Test Scenarios

It is anticipated that the specific interest rate and equity return rate paths underlying each test scenario will be provided by means of a return generator and/or supplied scenarios available on the NAIC website. The scenarios are defined in terms of 90 percentile random shocks in various directions over various periods of time. The sum of the random shocks over n periods has a distribution, and the 90 percent level of that distribution is 1.28 times the square root of n. As an example, to get a 90 percent 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

Interest rate shocks that maintain the cumulative shock at the 90% level (1.282 standard errors). Equity returns that maintain the cumulative equity return at the 90% level.

For illustration, the pop-up scenario has shocks of
1.28 times (sqrt(1) - sqrt(0)) in period 1;
1.28 times (sqrt(2) - sqrt(1)) in period 2;
1.28 times (sqrt(3) - sqrt(2)) in period 3; and so on.
By the end of period n, the cumulative shock is -1.28 times sqrt(n).

2. Scenario 2 – Pop up, low equity

Interest rate shocks that maintain the cumulative shock at the 90% level (1.282 standard errors). Equity returns that maintain the cumulative equity return at the 10% level.

3. Scenario 3 – Pop down, high equity

Interest rate shocks that maintain the cumulative shock at the 10% level (1.282 standard errors). Equity returns that maintain the cumulative equity return at the 90% level.

4. Scenario 4 – Pop down, low equity

Interest rate shocks that maintain the cumulative shock at the 10% level (1.282 standard errors). Equity returns that maintain the cumulative equity return at the 10% level.

5. Scenario 5 – Up/down, 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 equity

Interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks each 1.414 (square root of 2) times those in the first 10 years of Scenario 1. This gives the same 20-year cumulative shock as scenario 1 but all the shock is concentrated in the second 10 years. After 20 years, the same as scenario 1. Equity returns that maintain the cumulative equity return at the 90% level.

14. Scenario 14 – Delayed pop up, low equity

Interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks each 1.414 (square root of 2) times those in the first 10 years of Scenario 2. This gives the same 20-year cumulative shock as scenario 2 but all the shock is concentrated in the second 10 years. After 20 years, the same as scenario 1. Equity returns that maintain the cumulative equity return at the 10% level.

15. Scenario 15 – Delayed pop down, high equity

Interest rate shocks that are zero for the first 10 years, followed by 10 years of shocks each Scenario 15 – Delayed po

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)

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 failed to notify the commissioner of any action taken by a commissioner of another state similar to that under Paragraph (3) above.