

● **DISCUSSION DRAFT** ●

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**Standards for Life-Insurance Required Capital Levels**

**Developed by the  
Task Force on Principles-Based Reserves of the  
Life Committee of the  
Actuarial Standards Board**

**August 2009**

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**STANDARDS FOR LIFE-INSURANCE REQUIRED CAPITAL LEVELS**

A proposal for an actuarial standard of practice associated with current regulatory work on capital levels for life products is currently under development by the Task Force on Standards for Principles-Based Reserves of the Life Committee of the Actuarial Standards Board. This discussion draft is a result of that work and is intended to be consistent with draft instructions on this topic that are being considered by the NAIC. Please note that it is a work in progress and many changes are likely.

The Actuarial Standards Board (ASB) has authorized the Task Force on Standards for Principles-Based Reserves (TF) to distribute this discussion draft to illustrate how an actuarial standard of practice (ASOP) might work in conjunction with instructions for calculation of the C3 component of risk based capital for individual life insurance products. The ASB has neither reviewed nor approved this discussion draft. This is not an exposure draft.

The task force expects to create an exposure draft after discussions with interested parties and final action by the NAIC. That exposure draft (which will draw on the ideas in this discussion draft modified by discussions with interested parties and unfolding events) will go through the normal ASOP process:

1. The TF will submit the exposure draft (ED) to the Life Committee (LC).
2. The LC will revise the ED and submit it to the ASB.
3. The ASB will revise the ED and release it to all actuaries and other interested parties for comment. The ASB has the final authority with respect to actuarial standards of practice.
4. Following the end of the exposure period, the TF will revise the ED based on comments received and produce a proposed ASOP or a second ED (depending on the amount of change). This document will follow the same process as the original ED (and even if submitted as a proposed ASOP may be changed to a second ED by the LC or the ASB).
5. The ASOP will become effective only after final approval by the ASB. At this time, comments on the discussion draft received by the TF will not be shared with the ASB but may be used by the TF as input. Also, note that the discussion draft may undergo substantial change as it is being developed, at the sole discretion of the task force.

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**PROPOSED ACTUARIAL STANDARD OF PRACTICE**

**STANDARDS FOR LIFE-INSURANCE REQUIRED CAPITAL LEVELS**

**STANDARD OF PRACTICE**

Section 1. Purpose, Scope, Cross References, and Effective Date

- 1.1 Purpose—This actuarial standard of practice (ASOP) provides guidance to actuaries using a principle-based approach in connection with establishing risk-based capital levels for life insurance products in compliance with the NAIC *Annual Statement Instructions*. A principle-based approach is one in which the actuary models current and future risk, using actuarial judgment to set some of the assumptions in order to more accurately reflect the risks in insurance policies and contracts.

The C3 risk instructions mandate the calculation of an amount called the total asset requirement, which provides a measure of the risks associated with fluctuations in interest rates or equity values that can be used, in conjunction with other information from the annual statement and prescribed measures of other risks, to determine whether certain regulatory interventions may be made under the provisions of the Risk-Based Capital for Insurers Model Act. The effects of extreme adverse fluctuations in equity values are to be recognized in C3 only to the extent they exceed the effects provided for in the equity component of C1. C3 should also recognize adverse impacts of variations in lapse rates and expense inflation that may be associated with extreme interest rate and equity value fluctuations.

The C3 component is to be calculated by deducting the statutory reserve from the total asset requirement, even though the statutory reserve may be based on assumptions, such as those for mortality, that are inconsistent with the assumptions in the C3 cash flow models. These differences can have a substantial effect on the C3 requirement. All users should recognize that this happens because the development of principles based approaches to reserves and capital requirements are currently in a transitional stage on the way to a fully integrated system.

- 1.2 Scope—This standard applies to actuaries when performing professional services on behalf of life insurers, including fraternal benefit societies, in connection with the calculation of the C3 element of risk-based capital on a principle-based approach for individual life insurance policies, including individual certificates issued under a group policy, where such calculation is represented as being in compliance with the provisions of the Risk-Based Capital for Insurers Model Act and the NAIC *Annual Statement Instructions*.

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The actuary should comply with this standard except to the extent it may conflict with applicable law (statutes, regulations, and other legally binding authority). If compliance with applicable law requires the actuary to depart from the guidance set forth in this standard, the actuary should refer to section 4.4 regarding deviation from standard.

- 1.3 Cross References—When this standard refers to the provisions of other documents, the reference includes the referenced documents as they may be amended or restated in the future, and any successor to them, by whatever name called. If any amended or restated document differs materially from the original referenced document, the actuary should consider the guidance in this standard to the extent it is accurate and appropriate.
- 1.4 Effective Date—This standard will be effective for work performed on or after four months after adoption by the Actuarial Standards Board.

**Section 2. Definitions**

The terms below are defined for use in this actuarial standard of practice.

- 2.1 Anticipated Experience Assumption—An expectation of future experience for a risk factor given available, relevant information pertaining to the assumption being estimated.
- 2.2 Business Segment—A group of policies and associated assets that are modeled together to project future accumulated deficiencies. This grouping will generally follow the company’s asset segmentation plan, investment strategies, or approach used to allocate investment income for statutory purposes.
- 2.3 Cash Flow Model—A model that projects asset and liability cash flows.
- 2.4 Credibility—A measure of the predictive value that the actuary attaches to a particular body of data (the term “predictive” is used here in the statistical sense and not in the sense of predicting the future).
- 2.5 Deterministic—Describes an assumption or a scenario that is not stochastic.
- 2.6 Dynamic Modeling—The use of assumptions that are non-stochastic, but vary in response to scenario variations in stochastic assumptions. An example is the use of lapse rates that are a function of relative competitive position that can vary according to the interest rate scenario.
- 2.7 Granularity—The degree to which an asset and liability cash flow model contains separate components such as cells, or assumptions that vary by cell. Models with a higher

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degree of granularity (more cells or assumption variations) may better reflect the particularities of the cash flows being projected, but may require greater effort and greater expense to run.

- 2.8 Margin—An amount applied to an anticipated experience assumption in order to derive a prudent estimate assumption to provide for estimation error and adverse deviation. The existence of a margin increases the reported amount.
- 2.9 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.
- 2.10 Relevant Experience—Experience which has occurred on a historical basis in situations that are sufficiently similar to the liabilities, assets and environments being projected to make the experience appropriate as a basis for determining the assumptions for anticipated experience. Changing situations may be a matter of concern when evaluating relevance of experience.
- 2.11 Reported Amount—The reported amount is the minimum amount that is required to be reported by the company with respect to the C3 component of risk-based capital as of the valuation date for all policies required to use a principle-based approach. The reported amount equals the excess on the valuation date of the total asset requirement over the statutory liabilities reported with respect to the policies.
- 2.12 Risk Factor—An aspect of future experience that is uncertain as of the valuation date and that can affect the future financial results arising from the provisions of a policy. Examples include mortality, expense, policyholder behavior, default, equity return, and interest rates.
- 2.13 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.
- 2.14 Sensitivity Test—A calculation of the effect of varying an assumption, for the purpose of determining the significance of the assumption.
- 2.15 Stochastic—Describes an assumption or scenario that is generated by a random process.
- 2.16 Total Asset Requirement—The book value of a set of assets that are just sufficient to meet a specific solvency test.

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Section 3. Analysis of Issues and Recommended Practices

- 3.1 Regulatory Requirements—An actuary performing professional services within the scope of this standard should be familiar with the relevant portions of the Risk-Based Capital for Insurers Model Act, the NAIC *Annual Statement Instructions*, relevant portions of documents referenced therein such as the *Report of the American Academy of Actuaries' C3 Life and Annuity Capital Work Group on RBC C3 Requirements for Life Policies*, and this standard.
- 3.2 Qualified Actuary—Before advising a principal on a matter within the scope of this standard, an actuary should be familiar with the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States*, promulgated by the American Academy of Actuaries. [**Note: This section may be unnecessary, given the new approach in ASOP 41.**]
- 3.3 Total Asset Requirement—The total asset requirement is the sum of four amounts:
- a. The factor-based amount for blocks of policies that satisfy the stochastic exclusion test defined in the annual statement instructions. The actuary has discretion in assigning policies to blocks for testing and deciding whether to report the factor-based amount or the stochastic amount, if calculated, for each such block. In assigning policies to blocks for testing and in carrying out the calculations, the actuary should take account of the stated purpose of the test; namely, to determine whether the block of policies being tested exhibits material tail risk arising from interest-rate movements or equity performance.
  - i. Calculation of the Test Scenario Amounts—The stochastic exclusion test requires the calculation of test scenario amounts based on each of set of prescribed scenarios. The calculation of the test scenario amounts utilizes cash flow models with anticipated experience assumptions or, at the actuary's discretion, cash flow testing assumptions for those policies for which reserves are not principle based. Considerations related to the actuary's calculation of the test scenario amounts are similar to those related to the calculation of scenario amounts, and are discussed in detail in the remainder of this section. It should be noted that the test scenario amounts are present values of pre-tax cash flows rather than greatest present values of accumulated deficiencies on an after-tax basis. Also, the discount rates are net asset earned rates.



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- ii. The Consistency Requirement for Reinsurance—The denominator of the stochastic exclusion test ratio is an amount calculated from the base scenario that represents the present value of benefits and expenses for the policies, adjusted for reinsurance as appropriate to achieve consistency between the numerator and denominator of the ratio. In order to achieve consistency, the cash flows in the denominator should reflect the actuary’s estimate of the impact of the reinsurance agreement on the benefit and expense cash flows and should not contain any other cash flows, such as allowances representing amortization of previous expenses, contributions to profit or surplus or reinsurer loads, whether stated separately or incorporated into reinsurance rates. For example, quota share mortality reinsurance should result in the reduction of the mortality cash flows by the complement of the quota share. Similarly, a coinsurance agreement should result in a proportional reduction of benefit and expense cash flows.
  
  - b. The actuary may elect to exclude certain groups of policies from stochastic modeling and include the alternative amount as the contribution to the total asset requirement for those policies, provided the alternative amount covers a comparable level of risk as a calculated stochastic amount. The actuary may use other approaches to modeling, simplifying techniques, or conservative assumptions to calculate the alternative amount if the actuary determines that such approaches will produce an alternative amount that covers the level of adverse interest and equity experience provided for in the stochastic amount. The actuary must demonstrate how the calculation of the alternative amount meets these requirements and provide documentation. For some products, it may not be possible to demonstrate the adequacy of a calculated alternative amount without calculating the stochastic amount.
  
  - c. The calculation of the stochastic amount utilizes a cash flow model, a set of economic scenarios and prudent estimate assumptions. Considerations related to the actuary’s calculation of the stochastic amount are discussed in detail in the remainder of this section.
  
  - d. A non-modeled amount for liabilities not included in the company’s models.
- 3.4 Cash Flow Models—A principle-based approach requires that all material risks specific to the insurance contract be recognized. The approach is based on the analysis of future net cash flows, including the effects of risk mitigation techniques, such as reinsurance

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and hedging programs, arising from investment activity, benefits, policy dividends, premium taxes, expenses, and gross premiums, including deposits, which increase or decrease the assets allocated to the block of policies. Any guarantees applicable to elements of the net cash flows may create additional risks that should be reflected.

3.4.1 Business Segments—The actuary should assign each policy to a business segment. The assignment should provide for the appropriate projection of earned rates by combining policies that will be managed under a common investment policy, particularly as regards types of assets and reinvestment practices. Hence the actuary should do the following in making the assignment:

- a. Consider whether the assets backing the liabilities associated with the policies are managed under a common investment strategy or common investment guidelines, whether formal or informal; and
- b. Assure the assignment is consistent with applicable laws and regulations.

The actuary should assure that the assignment of policies to business segments leads to a reasonable model of future cash flows and investment actions. This does not preclude the actuary from assigning policies with offsetting risks to the same segment, if the assignment is otherwise appropriate and may reasonably be assumed to remain appropriate despite plausible changes in future conditions. The actuary should document the reasoning that was used in assigning policies to business segments.

3.4.2 Model Validation—The actuary should validate the model. The actuary should conduct a static validation of the model, in order to confirm that the initial values for face amount, policy count, and other basic statistics materially balance to the company records as of the model date. The actuary should review sample calculations for accuracy and verify the results of the model for cash flow patterns that are either predictable or explainable. The actuary should consider conducting additional validation procedures such as the following:

- a. back testing the model against historical data to verify that modeled results are reasonably close to actual results over a given time period; and
- b. comparing calculations from the model to any other existing company systems that have the same calculations for consistency. Any material differences between the model and the existing company systems should be explained.

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The actuary's validation findings should be quantified and communicated to management.

- 3.4.3 Asset Modeling Considerations—The actuary should develop an asset model for each business segment that adequately reflects all of the material characteristics and investment strategies of the asset portfolio of the business segment. Detailed guidance on asset modeling is contained in the *Report of the American Academy of Actuaries C3 Life and Annuity Capital Work Group on RBC C3 Requirements for Life Policies*.
- 3.4.4 Liability Modeling Considerations—The actuary should reflect in the calculation all policy provisions and risks specific to the insurance contracts, including those arising from guarantees, whether or not specifically mentioned in this standard or in law or regulation, that have a reasonable probability of materially affecting future policy cash flows or other contract-related cash flows. Costs that are not specific to the insurance contract, for example, shareholder dividends, and costs related to operational failures, mismanagement, fraud and regulatory risks should not be recognized in the calculation.
- a. The actuary may group policies with similar risk characteristics into representative cells. A model with high degrees of accuracy may provide a more accurate projection, but the projection will be more costly to produce. When choosing the level of granularity, the actuary should balance the benefit of increased accuracy with the cost required to obtain it. The actuary may decide to test the sensitivity of reserves to various levels of granularity. Such tests may be done as of a date other than the valuation date and need not be updated every year. The actuary should be particularly careful about the level of granularity in the premium assumptions (see section 3.5.3(b) below).
  - b. In projecting policy or other liability cash flows, the actuary should consider the impact of projected changes in experience on cash flows arising from policyholder dividends or other non-guaranteed elements. For example, projections of credited interest rates should appropriately reflect how the company is likely to respond to a projected change in asset yields. The actuary should consider current management policy and past company actions, as well as contractual provisions, when projecting future scale changes. For example, the actuary should consider incorporating in the model a lag between a change in experience and a change in scales if this reflects past company responses to changes in experience. If the model incorporates dynamic policyholder behavior assumptions, those assumptions and the scale projections should be consistent. For example,

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consistency may require increased lapse rates if credited interest rates tend to lag projected new money rates in a rising interest rate scenario.

- 3.4.5 Use of Prior Period Data—The actuary may elect to base the cash flow projections on asset and policy inforce data as of a date prior to the valuation date, subject to regulatory restrictions and provided that the projections can be adjusted so that the result that is based on such data is, in the actuary’s judgment, appropriate. Such adjustments should include recognition of the impact of new business between the two dates, the termination of older policies, and changes in investment policy. Deterministic estimates of the increase in the total asset requirement between the prior date and the valuation date will usually be acceptable. Under some circumstances, such adjustments may not produce an appropriate result for some or all policies. For example, if changes in equity market values or interest rates cause some guarantees to be “in the money” that were not so at the earlier date, projections based on the data and assumptions of the earlier date may not produce an appropriate result for policies having such guarantees. The actuary should disclose and discuss in the supporting memorandum any use of prior period data and the reasoning leading to the conclusion that the calculation based on such data is appropriate.
- 3.5 Anticipated Experience Assumptions—Where the RBC C3 requirements call for the use of prudent estimate assumptions, the underlying anticipated experience assumptions should be based on the insurer’s actual recent experience, if relevant and credible. To the extent the insurer’s actual experience is not sufficiently relevant or credible, the actuary should consider using other relevant and credible experience, such as industry experience, appropriately modified to reflect the insurer’s circumstances. The appropriate modifications should take into consideration any expected material differences in experience that could result from the company’s circumstances being different from those that existed when the other experience took place. Some examples of circumstances that may be different include the company’s underwriting practices, the market demographics, the design of the product, the economic environment, the regulatory environment, and the time period of the study. Where appropriate, such as for lapse or expense, assumptions should be dynamic (i.e., should vary with scenario). If no relevant and credible experience is available, the actuary should use professional judgment in modifying other sources of information.

The actuary should consider sensitivity testing the assumptions to determine those that have the most significant impact on results. In general, more analysis is warranted for assumptions that have a significant impact on results than for assumptions that are less significant.

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When establishing anticipated experience assumptions, the actuary should review any prior assumptions along with recent experience to determine whether continuing the existing assumptions is appropriate. The actuary should monitor emerging experience in such a way as to develop data for use in establishing assumptions in the future.

3.5.1 Mortality—Principles-based calculations should reflect company underwriting standards and mortality experience to the extent it is reasonable to do so.

- a. The actuary should use the most recent relevant company experience that is practicably available. Consideration should be given to the length of the observation period, recognizing the tradeoff between having insufficient data if the period is too short and having data no longer relevant if the period is too long.
- b. If relevant company experience for a particular risk class is available and has full credibility, the actuary should use that experience as the basis for deriving anticipated mortality. In situations where relevant company experience for a particular risk class is not available or does not have full credibility, the actuary should derive anticipated mortality in a reasonable and appropriate manner, using credibility methods to blend any partially credible data relevant for the risk class with other data from actual experience and past trends in experience of other similar types of business, either in the same company, in other companies (including reinsurance companies), or from other sources, generally in that order of preference. If the relevant company experience for a particular risk class and other relevant experience are insufficient to form an assumption, the actuary should use professional judgment in assessing anticipated mortality, taking into account where, in the spectrum of mortality experience, such business would be expected to fall relative to the mortality experience for other risk classes.
- c. The actuary should consider the effect that lapsation or nonrenewal activity or other anticipated policyholder behaviors has had or would be expected to have on mortality. The actuary should specifically take into account the effect of any anticipated or actual increase in gross premiums or cost of insurance charges on lapsation, and the resultant effect on mortality due to antiselection.
- d. Anticipated mortality should be assessed on a gross basis (i.e., direct business plus reinsurance assumed, before deducting reinsurance ceded). The actuary should consider the presence of reinsurance in deriving anticipated mortality. The anticipated mortality on reinsured business,

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both assumed and ceded, should pertain to that on the reinsured lives and exclude the effect of experience refunds or other adjustments, however characterized in the reinsurance agreements.

- e. In determining anticipated mortality, the actuary should consider trends in mortality, whether improvements or deterioration, which have been observed in company, industry or population experience, to the extent such trends are expected to continue. Trends in experience should not be used in determining anticipated mortality to the extent that such trends result from temporary conditions, such as changes in underwriting rules or procedures.

3.5.2 Investment Experience—The actuary should make reasonable assumptions about future investment experience that take into consideration the company's asset/liability management strategy for the product portfolio. Assumptions about default costs, and about investment spreads, should be prudent estimate assumptions.

- a. In selecting a set of scenarios of future U.S. Treasury rates and relevant equity values, the actuary should use an economic generator or otherwise choose a scenario set that takes into consideration historical data, and is appropriate in light of current and reasonably anticipated economic conditions. The actuary may rely upon generators or scenario sets specified for this purpose by regulatory authorities and by actuarial professional organizations, but must exercise due caution to assure that the prescribed generator or scenario set is appropriately applied. The actuary should derive anticipated experience related to other aspects of the projection of asset cash flows and net investment earnings for starting assets and reinvestment assets that is consistent with each selected scenario.
- b. Anticipated default costs for the various fixed income asset classes should be consistent with the type and quality rating of the asset class. The anticipated default cost for a particular asset class should take into consideration available insurance industry and broad financial market experience, and the company's own experience if, in the actuary's professional judgment, the experience is credible and relevant. The anticipated default costs for starting assets and reinvestment assets should be consistent for each asset class.
- c. In establishing the anticipated spreads over treasuries for the purchase of reinvested assets, the actuary should consider the company's current

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investment strategy for the block of business and whether the reinvestment assets will be consistent with the types, quality and maturities of assets in the company's current investment strategy. For example, the current investment strategy may also relate to matching the duration of assets and liabilities over time. In that case, the maturities of future reinvestment assets may be different from the current strategy regarding maturities.

- d. The actuary should consider any variability in the timing of the asset cash flows related to movements in interest rates, such as prepayment risk, and incorporate such variability into the various scenarios within the model. For example, prepayment, extension, call and put features should be specifically modeled in a manner consistent with current asset adequacy analysis practice (ASOP Nos. 7 and 22).

3.5.3 Policyholder Behavior—The actuary should develop anticipated policyholder behavior assumptions for the cash flow models generally including premium payment patterns, premium persistency, surrenders, withdrawals, transfers between fixed and separate accounts on variable products, benefit utilization, and other option elections.

- a. General Considerations

1. When establishing these assumptions, the actuary should consider that anticipated policyholder behavior may be expected to vary according to such characteristics as gender, attained age, issue age, policy duration, time to maturity, tax status, level of account and cash value, surrender charges, transaction fees or other policy charges; distribution channel, product features and whether the policyholder and insured are the same person or not.

The actuary should develop anticipated policyholder behavior assumptions that are appropriate for the block of business. The actuary should give due consideration to other assumptions of the model when deriving anticipated policyholder behavior.

The actuary should not constrain anticipated policyholder behavior to the outcomes and events exhibited by historic experience, especially when modeling policyholder behavior of a new product benefit or feature.

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The actuary may ignore certain items that might otherwise be explicitly modeled particularly if the inclusion of such items would not have a material effect on the results.

2. Options embedded in the product, for example, term conversion privileges or policy loans, may impact policyholder behavior. The actuary should consider that as the value of a product option increases, there is an increased likelihood that policyholders will behave in a manner that maximizes their financial interest in the contract (for example, lower lapses, higher benefit utilization, etc.) The actuary may ignore options that are not material drivers of policyholder behavior.
3. Unless there is clear evidence to the contrary, anticipated policyholder behavior assumptions should be consistent with relevant past experience and reasonable future expectations. At any duration for which relevant data do not exist, the actuary should consider taking into account what action will maximize the value of the policy from the point of view of an impartial investor who owns the policy (i.e., lapse the policy, persist, take out a loan, etc.) The actuary should also recognize that policyholders may place value on factors other than maximizing the policy's financial value (for example, convenience of level premiums, personal budget choices, etc.), and that the policy's full economic value to the policyholder depends not only on its currently realizable value but also on factors not available for analysis, such as the health of the insured and the financial circumstances of the beneficiaries and policyholder.
4. The actuary should exercise care in using static assumptions when it would be more natural and reasonable to use a dynamic model or other scenario-dependent formulation for anticipated policyholder behavior. Risk factors that are modeled dynamically should encompass the reasonable range of future expected behavior consistent with the economic scenarios and other variables in the model. The actuary should test the sensitivity of results to understand the materiality of making alternative assumptions.

b. Premium Assumptions

An important element of the cash flow model is the set of assumptions about the amount of premium to be paid in each future period on policies



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remaining inforce, and assumptions about premium persistency, the probability that a premium will be paid in a particular period. While historical experience, when available, is often a good basis for such assumptions, the actuary should exercise care about assuming that past behavior will be indefinitely maintained. For example, market or environmental changes can make historical experience less relevant. The actuary should also consider varying premium payment assumptions by interest rate scenario.

The actuary should consider the desirability of making multiple premium payment assumptions, by subdividing the cell of business into several projection cells, each with a separate payment pattern assumption. If this is not done, and the actuary decides to use one average pattern for the cell, the actuary should consider making use of sensitivity testing, which may help to determine whether the estimates of reserves or risks are materially impacted by the use of such an approach.

For policies with fixed future premiums, the actuary should of course assume that future premium payments on inforce policies will be in accordance with the policy provisions. In other situations, the actuary, in formulating assumptions about future premium payments, should consider taking into account such factors as the limitations inherent in the policy design, the amount of past funding of the policy, and the marketing of the policy.

Marketing factors that may lead to low premium payments include:

1. Marketing emphasis on coverage (as opposed to savings accumulation);
2. Marketing emphasis on premium flexibility; and
3. Illustrations featuring quick-pay premiums.

Marketing factors that may lead to high premium payments include:

1. Marketing emphasis on savings accumulation or tax advantages;
2. Pre-authorized transfers; and
3. Bonuses for higher premiums or assets.

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In selecting multiple premium patterns for modeling purposes, the actuary may consider using one or more of the following patterns: target premium, illustrated premium, billed premium, minimum premium, and/or continuation of past premium levels.

c. **Withdrawal and Surrender Assumptions**

The actuary should exercise care in using static assumptions when it would be more appropriate to use a dynamic model reflecting projected interest rate environment, funding level, premium increases, and benefit triggers. In particular, when dealing with extreme interest rate environments, as is the case in establishing the capital level for C3 risk, the actuary should be aware of the impact that such environments would have on withdrawal and surrender rates. In setting partial withdrawal and surrender assumptions, the actuary should consider the insured's age and gender, and the policy duration and the existence of policy loans. In addition, the actuary should consider taking into account such factors as the policy's competitiveness, surrender charges, interest or persistency bonuses, taxation status, premium frequency and method of payment, and any guaranteed benefit amounts. The actuary should consider the fact that rates of surrender can decline dramatically prior to a scheduled sharp increase in surrender benefit (sometimes known as a "cliff") caused by a decrease in surrender charge, a bonus or a maturity benefit, and rates of surrender can rise materially after such an event.

3.5.4 Expenses—The actuary should review the expenses that have been allocated, for financial reporting purposes, in recent years to the block of policies. Those expenses that are classified as "direct sales expenses" or as "taxes, licenses, and fees," should be directly allocated to the activity creating the expense. All other expenses should be allocated to the appropriate activity count (per policy, per claim, etc.) and by duration where appropriate, using reasonable principles of expense allocation and unit costs. This analysis should normally serve as the basis for projecting expenses in doing the calculation, but if, in the judgment of the actuary, the expense experience is not a suitable basis for projection, other sources of data may be used (as set forth in section (b) below).

a. **Expense Inflation**—The actuary should consider whether unit costs (particularly those other than direct sales expenses and taxes, licenses, and fees) ought to be treated in the projection as subject to inflation. Applicable law may require such an assumption. Possible sources of information about inflation assumptions are published projections of the CPI or the price deflator, such as the rate selected by the Social Security Administration for its long-term intermediate projection. The actuary may

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also wish to assume that future inflation rates will vary if prevailing new-money rates change. The resulting projection of implied “real return” should be reviewed by the actuary for reasonability.

- b. Applying Recent Expense Experience—In reviewing recent experience, the actuary should be satisfied that the expenses being allocated to the block of policies being evaluated represent all expenses associated with the block, including overhead, according to statutory accounting principles. If the recent experience on the block is not, in the judgment of the actuary, a suitable basis for projection, the actuary may use experience on a closely similar type of policy within the company, or intercompany studies, provided that any regulatory approval required for such a step is obtained.

Acquisition expenses and significant non-recurring expenses expected to be incurred after the valuation date should be included in the expense assumptions. The actuary should be careful to make provision for unusual future expenses, such as severance costs or litigation costs, which may be anticipated.

If system development costs or other capital expenditures are amortized in the annual statement the actuary should reflect such amortization in the assumptions. If such expenditures occurred in the exposure period and were not amortized the actuary may exclude them from the experience, but should consider the possibility that similar expenditures will occur in the future.

In projecting direct sales expenses, the actuary may take into account recent changes in company practice, such as changes in commission rates that may not have been fully reflected in the experience. Projection of taxes, licenses, and fees should be based on a reasonable activity base (such as premium).

Recent changes in company practice, such as changes in staffing levels, that could affect “all other” expenses, may be reflected in the projection, but the actuary should, in the case of changes that are planned but not fully implemented, consider the probability that the changes will actually affect expenses.

- 3.5.5 Taxes—Federal income taxes should be treated according to the NAIC *Annual Statement Instructions* or other texts referenced therein. Other taxes that are not

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included in “taxes, licenses and fees” item should be separately recognized in the projection.

- 3.6 Determining Assumption Margins—In order to produce the prudent estimate assumptions required by the NAIC *Annual Statement Instructions*, the actuary should modify the assumptions for risks that are not modeled stochastically, using judgment to determine how much modification should be made for each assumption, so as to include a margin for estimation error and moderately adverse deviation. The actuary should ensure that assumptions that are modeled dynamically (i.e., assumed to vary as a function of a stochastic assumption, such as lapse rates, inflation rates, or non-guaranteed elements that vary in response to interest rates) do carry an adequate margin throughout all their variations.
- a. Modifying Assumptions—The modification for a particular assumption should be such that the calculated level of capital is increased thereby. If the direction of impact of changing an assumption is not clear, the actuary should attempt to determine the nature of the change that is appropriate. If it is not practical to determine the directional impact, then the actuary need not modify that assumption. For each assumption that is modified, the actuary should make a modification whose magnitude reflects the degree of risk and uncertainty in that assumption. When determining the degree of risk and uncertainty, the actuary should take into account the magnitude and frequency of fluctuations in relevant historical experience, if available. In doing so, the actuary should consider using statistical methods to assess the potential volatility of the assumption in setting an appropriate margin. The additive impact of margins for all assumptions should be established at a level that provides for an appropriate amount of adverse deviation in the aggregate, even though it may seem that the margin for an individual assumption may not appear adequate on a stand-alone basis.
  - b. Sensitivity Testing—The actuary may use sensitivity testing to evaluate the significance of an assumption in determining the valuation results. For assumptions that are relatively insignificant, the actuary may decide to add little or no margin to the anticipated experience assumption.
- 3.7 Reliance on Data or Other Information Supplied by Others—When relying on data or other information supplied by others, the actuary should refer to ASOP No. 23, *Data Quality*, for guidance.
- 3.8 Documentation—The actuary should create records and other appropriate documentation supporting the valuation and, to the extent practicable, should take reasonable steps to ensure that this documentation will be retained for a reasonable period of time (and no less than the length of time necessary to comply with any statutory, regulatory, or other

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requirements). The actuary need not retain the documentation personally; for example, the actuary's company may retain it. Such documentation should cover all aspects of the actuarial valuation in sufficient clarity such that another actuary qualified in the same practice area could evaluate the reasonableness of the actuary's work. The documentation supporting the actuary's report should be made available to the company, and if required, regulators.

Section 4. Communications and Disclosures

**[Note: Section 4 is intended to be consistent with the recent ASB promulgation on deviations.]**

- 4.1 Disclosures—The actuary should include the following, as applicable, in an actuarial communication:
- 4.1.1 The disclosure in ASOP No. 41, section 4.2, if any material assumption or method was prescribed by applicable law (statutes, regulations, and other legally binding authority);
  - 4.1.2 The disclosure in ASOP No. 41, section 4.3.1, if any material assumption or method was selected under applicable law by a party other than the actuary, and the actuary disclaims responsibility for the assumption or method;
  - 4.1.3 The disclosure in ASOP No. 41, section 4.3.2, if the actuary disclaims responsibility for any material assumption or method in any situation not covered under section 4.1.1 or 4.1.2; and
  - 4.1.4 The disclosure in ASOP No. 41, section 4.4, if the actuary otherwise deviated from the guidance of this ASOP.
- 4.2 Actuarial Report—The actuary should include the following items of disclosure in the actuarial report, as well as any others that may be specified by the *Report of the American Academy of Actuaries' C3 Life and Annuity Capital Work Group on RBC C3 Requirements for Life Policies*:
- a. The amount of C3 required capital, and the amount for each calculation method (for example, stochastic amount, factor based amount, alternative amount, factor based amount, or non-modeled amount) and the rationale for choice of calculation method.
  - b. The type and amount of assets assigned to each business segment (and the reasons for the way the assets were assigned), the investment strategy for each business

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segment, default assumptions, reinvestment yield assumptions, and prepayment and call assumptions.

- c. The impact of any derivative, hedging, revenue sharing, or reinsurance programs on the projections.
  - d. The nature and rationale for the scenarios used for stochastic projections of interest rates and equity returns.
  - e. The rationale for assignment of products to business segments and the principal product features and guarantees that affect risk.
  - f. The experience basis for assumptions about mortality, policyholder behavior, and expense, including a description of (i) credibility methods, (ii) the methods used to calculate margins, and (iii) the dynamic modeling assumptions for risk factors that may be expected to vary as interest rates vary.
  - g. Description of model validation and of any material sensitivity tests.
  - h. The rationale for any assumptions about nonguaranteed elements.
  - i. A description of any simplified methods used, and the methods used to group assets and policies in the model projections.
  - j. A description of how assumptions have changed since prior analyses.
  - k. The methods used to adjust any results that were based on projections as of a date prior to the valuation date, and the possible effect of events subsequent to the valuation date.
  - l. Any concerns that the actuary has about C3 risks that may not have been appropriately addressed in the calculation, because of uncertainties in the interest rate or equity environment, or inadequacies in the models used.
- 4.3 Reliance on Others for Data, Projections, and Supporting Analysis—The actuary may rely on data, projections, and supporting analysis supplied by others. In doing so, the actuary should disclose in the supporting memorandum both the fact and the extent of such reliance. Such disclosure may be prescribed in applicable law. The accuracy and comprehensiveness of data, projections, and supporting analysis supplied by others are the responsibility of those who supply the data, projections, and supporting analysis. When practicable, the actuary should review the data, projections, and supporting

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analysis for reasonableness and consistency, and disclose such a review. For further guidance, the actuary is directed to ASOP No. 23.

- 4.4 Retention—The actuary, to the extent practicable, should take reasonable steps to ensure that the supporting memorandum will be retained for a reasonable period of time (and no less than the length of time necessary to comply with any statutory, regulatory, or other requirements).