ACTUARIAL STANDARDS BOARD

● **SECOND EXPOSURE DRAFT** ●

Proposed
Actuarial Standard
of Practice

Principle-Based Reserves for Life Products

Comment Deadline:
December 15, 2014

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

Approved for Exposure by the
Actuarial Standards Board
June 2014

T A B L E O F C O N T E N T S

APPENDIXES

June 2014

TO: Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in Principle-Based Reserves for Life Products

FROM: Actuarial Standards Board (ASB)

SUBJ: Proposed Actuarial Standard of Practice (ASOP) on Principle-Based Reserves for Life Products

This document contains the second exposure draft of a proposed ASOP, *Principle-Based Reserves for Life Products*. Please review this exposure draft and give the ASB the benefit of your comments and suggestions. Each written response and each response sent by e-mail to the address below will be acknowledged, and all responses will receive appropriate consideration by the drafting committee in preparing the final document for approval by the ASB.

The ASB accepts comments by either electronic or conventional mail. The preferred form is e-mail, as it eases the task of grouping comments by section. However, please feel free to use either form. If you wish to use e-mail, please send a message to **comments@actuary.org**. You may include your comments either in the body of the message or as an attachment prepared in any commonly used word processing format. **Please do not password protect any attachments**. Include the phrase "ASB COMMENTS" in the subject line of your message. Please note: Any message not containing this exact phrase in the subject line will be deleted by our system's spam filter.

If you wish to use conventional mail, please send comments to the following address:

Principle-Based Reserves (Second Exposure)
Actuarial Standards Board
1850 M Street, NW, Suite 300
Washington, DC 20036

The ASB posts all signed comments received to its website to encourage transparency and dialogue. Unsigned or anonymous comments will not be considered by the ASB nor posted to the website. The comments will not be edited, amended, or truncated in any way. Comments will be posted in the order that they are received. Comments will be removed when final action on a proposed standard is taken. The ASB website is a public website and all comments will be available to the general public. The ASB disclaims any responsibility for the content of the comments, which are solely the responsibility of those who submit them.

Deadline for receipt of responses in the ASB office: December 15, 2014

Background

The forces that led to the consideration of principle-based approaches to reserving for individual life insurance are discussed in appendix 1 of this document. As changes to laws and regulations that would incorporate such approaches started to develop several years ago, the ASB decided to explore the need for a standard of practice and formed a task force to produce a discussion draft of the standard. That task force created a discussion draft containing potential actuarial guidance for carrying out a principle-based valuation that was consistent with VM-20 (the relevant chapter of the *Valuation Manual*). The discussion draft was reviewed and modified by a large group of interested parties and as the draft of VM-20 itself changed over time. In 2013, the discussion draft was released as an exposure draft for consideration and comment. Seven comment letters were received within the comment deadline.

Key Issues

In redrafting the standard, the reviewers focused on the following key issues:

1. Under VM-20, the company, not the actuary, is responsible to the regulators for compliance, although one or more qualified actuaries is responsible to senior management for overseeing the calculation of principle-based reserves and for signing the PBR Actuarial Report. Actuarial Standards of Practice are directives to actuaries, and this exposure draft is intended to guide actuaries who are working on matters subject to VM-20. Text in section 1.2 is intended to clarify this issue.

2. Many comments indicated that too much of the text was duplicative of VM-20. This draft eliminates most of the duplicative text. Where the reviewers believe that some quotation or summary of VM-20 language was necessary to clarify text in this standard, the standard indicates the portion of the text that was drawn from VM-20.

3. The reviewers decided to focus the guidance in this standard on reserves for which company experience is used to some extent in establishing assumptions or when cash flow models are used. Thus, the reviewers decided to limit the guidance on "net premium reserves" even though they are part of the minimum reserve defined in VM-20.

4. The reviewers recognize that amendments to VM-20 (which are facilitated by the structure of the *Valuation Manual)* may create a need for changes in the standard.

Request for Comments

The ASB would appreciate comments on all areas of this proposed standard and would like to draw the reader's attention in particular to the following questions, which are discussed in the preceding "Background" section:

1. Is the distinction between the company's responsibility and the actuary's responsibility clear?

2. Does the language of the standard quote or summarize VM-20 text appropriately and usefully?

3. A lot of duplicative material has been removed, although some language has been retained for clarification. Is the amount of material remaining in the standard appropriate?

4. Is it sufficiently clear how the standard applies to actuaries who do not sign the PBR actuarial report but are involved in the preparation of principle-based reserves?

The ASB approved this second exposure draft at its June 2014 meeting.

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The ASB establishes and improves standards of actuarial practice. These ASOPs identify what the actuary should consider, document, and disclose when performing an actuarial assignment. The ASB's goal is to set standards for appropriate practice for the U.S.

SECOND EXPOSURE DRAFT—June 2014

PROPOSED ACTUARIAL STANDARD OF PRACTICE

PRINCIPLE-BASED RESERVES FOR LIFE PRODUCTS

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 when performing actuarial services in connection with developing or opining on **principle-based reserves** for life insurance that are reported by companies in compliance with the National Association of Insurance Commissioners (NAIC) *Standard Valuation Law* (referred to herein as the *Standard Valuation Law*) and the NAIC *Valuation Manual* as adopted in December 2012.

1.2 Scope—This standard applies to actuaries when performing actuarial services on behalf of life insurance companies, including fraternal benefit societies, in connection with the calculation or review of reserves for individual life insurance policies subject to Chapter VM-20: Requirements for Principle-Based Reserves for Life Products of the *Valuation Manual*(VM-20), where such reserves are represented by the actuary as being in compliance with the provisions of the *Standard Valuation Law* and the *Valuation Manual* governing **principle-based reserves**.

The *Standard Valuation Law* and the *Valuation Manual* state that compliance is the responsibility of the company. Actuaries frequently participate in the application of principle-based methods in the preparation of insurance company reserves. To the extent an actuary is involved in these activities, that actuary should follow the applicable guidance in this standard.

If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority), or for any other reason the actuary deems appropriate, the actuary should refer to section 4.

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 applicable and appropriate.

1.4 Effective Date—This standard will be effective for work performed starting four months after adoption by the Actuarial Standards Board.

Section 2. Definitions

The terms below are defined for use in this ASOP.

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 Asset Segmentation Plan—The plan by which an insurer allocates assets among lines of business for establishing investment strategies, for allocating investment income, for performing risk management analyses, or for supporting the reporting of investment income for statutory purposes.

2.3 Cash Flow Model—A model designed to simulate asset and liability cash flows.

2.4 Credibility—A measure of the predictive value in a given application that the actuary attaches to a particular body of data. (*Predictive* is used here in the statistical sense and not in the sense of predicting the future.)

2.5 Deterministic Reserve—A reserve calculated under a defined **scenario** and a single set of assumptions in accordance with VM-20.

2.6 Granularity—The extent to which a model contains separate components such as cells or assumptions that vary by cell or time intervals.

2.7 Margin—An amount included in a **prudent estimate assumption** that incorporates conservatism in the calculated value and is intended to provide for estimation error and adverse deviation related to a corresponding **anticipated experience assumption**.

2.8 Minimum Reserve—The **minimum reserve** standard for all life policies subject to the requirements of the *Valuation Manual*.

2.9 Model Segment—A group of policies and associated assets that are modeled together to determine the path of net asset earned rates.

2.10 Modeling Cell—Policies that are treated in a **cash flow model** as being completely alike with regard to demographic characteristics, policyholder behavior assumptions, and policy provisions.

2.11 Net Premium Reserve—The formula reserve calculated in accordance with the procedures set forth in the *Valuation Manual*.

2.12 Principle-Based Reserve (PBR) Actuarial Report—The document or set of documents containing supporting information prepared by the company under the direction of a **qualified actuary** as required by Chapter VM-31: PBR Report Requirements for Business Subject to a Principle-Based Reserve Valuation of the *Valuation Manual*(VM-31).

2.13 Principle-Based Valuation—A reserve valuation that uses one or more methods or one or more assumptions determined by the insurer and is required to comply with section 12 of the Standard Valuation Law as specified in the *Valuation Manual*.

2.14 Prudent Estimate Assumption—A **risk factor** assumption developed by applying **margins** to the **anticipated experience assumption** for that **risk factor**.

2.15 Qualified Actuary—An individual who is qualified to sign statements of actuarial opinion required by VM-20 and VM-31 in accordance with the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* and who meets the requirements specified in the *Valuation Manual*.

2.16 Relevant Experience—Experience in situations that are sufficiently similar to the liabilities, assets, and environments being projected to make the experience appropriate, in the actuary's professional judgment, as a basis for determining the assumptions for anticipated experience.

2.17 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, and asset return.

2.18 Scenario—A projected sequence of events used in the **cash flow model**, such as future interest rates, equity performance, or mortality.

2.19 Sensitivity Test—A calculation of the effect of varying an assumption.

2.20 Starting Assets—A portfolio of assets that will be used to fund projected policy cash flows arising from the policies funded by those assets.

2.21 Stochastic Reserve—A reserve amount calculated with stochastically generated **scenarios** in accordance with VM-20.

2.22 Valuation Date—The date as of which the reserve is to be determined.

Section 3. Analysis of Issues and Recommended Practices

3.1 Regulatory Requirements—An actuary performing actuarial services within the scope of

this standard should be familiar with applicable law and regulation including the *Standard Valuation Law* and the *Valuation Manual*.

VM-20 describes the calculation of **stochastic reserves**, **deterministic reserves**, and **net premium reserves**. The required minimum reserve is based on one or more of these reserves as described in section 2 of VM-20.

3.2 Net Premium Reserve—The actuary should calculate **net premium reserves** using assumptions and methods prescribed by section 3 of VM-20.

3.3 Exclusion Tests—Section 6 of VM-20 provides for certain exclusion tests that, if satisfied, allow the insurer to dispense with the calculation of the **stochastic reserves** or **deterministic reserves** for a group of policies.

3.3.1 Grouping—In constructing groups of contracts for the purposes of applying the stochastic exclusion ratio test and the deterministic exclusion test, the insurer may not group together contract types with significantly different risk profiles.

In evaluating a group of contracts against this criterion, the actuary should consider the following:

a. the risk profile indicated by the contractual provisions of the policies and the impact of varying economic or other conditions on that risk profile;

b. results of other analyses performed that may provide an indication of the risk profile of a proposed group of policies (for example, economic capital analysis or cash flow testing analysis);

c. the risk profile indicated by the demographics of the policyholders and insureds; and

d. any other information available to the actuary that indicates that the policies have similar or significantly different risk profiles.

3.3.2 Certification—In some cases, satisfying an exclusion test requires a certification by a **qualified actuary** that a group of policies is not subject to material interest rate risk or asset return volatility risk. In providing such a certification, the actuary should evaluate the group as a whole and consider, in addition to examples provided in section 6 of VM-20, such as the following:

a. changes in the economic environment or competitive landscape that could cause a material interest rate or asset return volatility risk to arise in the future; and

b. the results of other analyses that may have been completed as part of an economic capital measurement process or cash flow testing.

3.4 Stochastic and Deterministic Reserves—The actuary should calculate **stochastic reserves** and **deterministic reserves** using models and assumptions as described in sections 7, 8, and 9 of VM-20.

3.4.1 Modeling—The actuary should use modeling methods that are appropriate for the business being valued.

a. Cash Flow Model—Section 7 of VM-20 requires companies to design and use a **cash flow model** that does the following:

1) complies with applicable ASOPs in developing **cash flow models** and projecting cash flows;

2) uses **model segments** consistent with the insurer's **asset segmentation plan**, investment strategies, or approach used to allocate investment income for statutory purposes;

3) assigns each policy in the **cash flow model** to only one **model segment** and uses a separate **cash flow model** for each **model segment**; and

4) projects cash flows for a period that extends far enough into the future so that no obligations remain.

b. Model Segments—The construction of **model segments** facilitates the calculation of asset earned rates and discount rates. To do this, the actuary should model the reinvestment and disinvestment of cash flows in accordance with an investment strategy. Usually, this means that the segment should contain only policies that will be managed under a common investment policy, particularly with regard to reinvestment and borrowing practices. If this is not the case, the actuary should take into account the effects of variations in the proportions of the policies subject to each such investment policy due to plausible changes in future conditions and demonstrate that the **minimum reserve** appropriately recognizes such variations.

The actuary may assign policies with offsetting risks to the same **model segment** if the assignment is otherwise appropriate (for example, when there is a common investment strategy) and the risks may reasonably be assumed to remain offsetting under plausible changes in future conditions.

c. Model Validation—The actuary should consider a static validation that confirms that the initial values for reserves, face amount, policy count, and other basic statistics materially balance to the insurer's records as of the model date. The actuary should consider the extent to which a model has been previously reviewed as well as controls around model changes in determining the level of model review required for the current valuation. A model that in the actuary's judgment was previously subject to rigorous review and testing and updated in a controlled manner may require less rigorous current review.

The actuary should consider conducting additional validation procedures such as the following:

1) performing a dynamic validation of the model that involves comparing the cash flows produced by the model to the actual historical data to verify, where appropriate, that the model produces results reasonably similar to those actually experienced;

2) evaluating the consistency of the model's results to the results of any other existing internal systems that have similar calculations; and

3) performing an analysis that critically reviews each of the changes made to the model since it was last validated.

d. Liability Modeling Considerations—In determining the **minimum reserve**, the actuary should reflect all relevant policy provisions and risks specific to the insurance contracts, including those arising from guarantees that have a reasonable probability of materially affecting future policy cash flows or other contract-related cash flows. According to section 9 of VM-20, costs that are not specific to the insurance contract (for example, federal income taxes, shareholder dividends, and costs related to operational failures, mismanagement, fraud, and regulatory risks) are not recognized in the reserve calculation.

1) The actuary may group policies with similar risk characteristics in representative **modeling cells**. When grouping is used, the actuary should demonstrate that the use of a model with a higher degree of **granularity** is unlikely to result in a materially higher **minimum reserve**. Acceptable demonstrations for this purpose include, but are not limited to, the following:

i. comparison of the results of the grouping based on a representative sample of **modeling cells** to the results of a

seriatim calculation on the same representative sample; and

ii. a demonstration that extremes of adverse experience for a sample set of **scenarios** have closely similar effects on the **minimum reserve** for all policies assigned to the same sample cells. Such demonstrations may be done as of a date other than the **valuation date** and need not be updated every year, unless the actuary determines that conditions likely to affect the result have changed.

2) In projecting policy or other liability cash flows, the actuary should consider the impact of projected changes in experience on cash flows arising from nonguaranteed elements (including policyholder dividends). For example, if the insurer bases credited rates on current asset yields, the actuary should model projected credited rates that are consistent with projected asset yield rates. The actuary should consider contractual provisions, regulatory constraints, current management policy, and past company actions, such as any lag between a change in experience and a change in nonguaranteed elements, when projecting future nonguaranteed element changes. The actuary should determine policyholder behavior assumptions that are consistent with the nonguaranteed element projections. For example, consistency may require increased lapse rates if credited interest rates tend to lag projected new money rates in a rising interest rate **scenario**.

e. Use of Prior Period Data—Section 1 of VM-20 provides that the company may calculate the **deterministic reserve** and the **stochastic reserve** as of a date no earlier than three months before the **valuation date**, using relevant company data, provided an appropriate method is used to adjust those reserves to the **valuation date**.

When using such a prior "as of" date the actuary should document the nature of any updating adjustments made to the reserves, and why the use of prior period data plus such adjustments would not produce a material difference from calculating reserves as of the **valuation date**. The actuary should also demonstrate that any material events known to the actuary that occurred between the two dates do not diminish the appropriateness of the results.

When evaluating the appropriateness of using prior period data, the actuary should consider the following:

1) a comparison of the asset portfolio between the two dates by type of asset, mix of assets by quality, and the nature of assets (for example, duration, yield, and type) and a comparison of the size and nature of the inforce policies between the two dates (for example, average size, policy counts, and mix);

2) changes in the interest rate curve, interest spreads, and equity values between the two dates, including, as an example, changes causing guarantees to be "in the money" that were not as of the prior date, and vice-versa;

3) changes in policyholder behavior (surrenders, lapses, premium patterns, etc.); and

4) validation procedures such as comparing a subset of policies by calculating reserves as of both dates.

3.4.2 Assumptions—In setting assumptions, the actuary should consider ASOP No. 23, *Data Quality*, and ASOP No. 25, *Credibility Procedures*, as applicable. Within the range of acceptable practices described in VM-20, the actuary should use professional judgment in setting reasonable assumptions.

Section 9 of VM-20 states that "The company shall use its own experience, if relevant and credible, to establish an **anticipated experience assumption** for any **risk factor**. To the extent that company experience is not available or credible, the company may use industry experience or other data to establish the **anticipated experience assumption**, making modifications as needed to reflect the circumstances of the company."

Where no relevant and credible company information is available, the actuary should use professional judgment in advising on the adoption and modification of other sources of experience data. Examples of items that may result in modifications to the experience data include the company's underwriting practices, market demographics, product design, and economic and regulatory environments.

Section 9 of VM-20 suggests sensitivity-testing the assumptions to determine those that have the most significant impact on reserves. The actuary should consider performing more analysis for assumptions that have a significant impact on valuation results than for assumptions that have a less significant impact.

a. Mortality—To the extent appropriate in the actuary's judgment, the actuary should base **anticipated experience assumptions** for mortality on the insurer's underwriting standards and mortality experience.

Section 9 of VM-20 limits the exposure period for a company's own experience to between three and ten years and defines mortality segments within which separate mortality assumptions must be made. The methods for determining **credibility** of the experience and the methods for grading into industry standard tables are set forth in section 9 of VM-20.

In choosing an exposure period, consideration should be given to the possibility that data may be obsolete if the period is too long, but that a shorter period may reduce the **credibility** to be assigned to the data. The actuary should refer to ASOP No. 25 for guidance on **credibility**. The actuary should consider the possibility of combining several mortality segments for the purpose of achieving a higher level of **credibility**, but in doing so the actuary should be aware that section 9 of VM-20 allows such combining only if the mortality experience was determined for the combined segments and then appropriately subdivided.

The actuary should consider reflecting 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 consider 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.

In determining anticipated mortality, the actuary should consider mortality trends that have been observed in company, industry, or population experience and determine the extent to which such trends are expected to continue.

If the actuary determines that recognizing the continuation of mortality trends beyond the **valuation date** will increase reserves, the actuary should incorporate such trends into the assumptions for the cash flow projections. Otherwise, the actuary should not project mortality trends beyond the **valuation date** unless permitted by applicable law. However, the actuary may include mortality improvement beyond the **valuation date** in the aggregate **margin** amount that the actuary is required to report under VM-31 section 3.E.12.

b. Investment Experience—The actuary should make reasonable assumptions about future investment experience that take into consideration the insurer's asset/liability management strategy for the product portfolio.

1) Sets of **scenarios** of future U.S. Treasury rates and future equity values are specified in appendix 1 of VM-20. In applying these sets

of **scenarios**, the actuary may use **scenario** reduction techniques. When using these techniques, the actuary should be satisfied that the techniques used are appropriate to the situation and can reasonably be expected not to result in a material reduction in **minimum reserves**.

2) Factors and methods for determining prescribed default assumptions and spread assumptions are set forth in section 9 and appendix 2 of VM-20. The prescribed default assumptions apply to reinvested assets as well as **starting assets**. The actuary should model the reinvestment of cash flows in accordance with the insurer's investment strategy for the **model segment** or in accordance with a strategy that is closely similar to the actual strategy currently being used for the **model segment**. If the insurer's investment strategy is to duration-match assets and liabilities, the actuary should reflect the rebalancing needed specific to each **scenario** to the extent practicable.

3) Section 7 of VM-20 requires that variability in the timing of the asset cash flows related to movements in interest rates, such as prepayment risk, be incorporated into the model. For example, prepayment, extension, call, and put features should be specifically modeled in a manner consistent with current asset adequacy analysis practice. (For related guidance, see ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*, and ASOP No. 22, *Statement of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers.*)

c. Policyholder Behavior—Anticipated policyholder behavior assumptions for the **cash flow models** usually include premium payment patterns, premium persistency, surrenders, withdrawals, transfers between fixed and separate accounts on variable products, benefit utilization, and other option elections.

1) General Considerations—General considerations include the following:

i. According to section 9 of VM-20, 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, account and cash values, surrender charges, transaction fees, or other policy charges; distribution channel; product features; and whether the

policyholder and insured are the same person.

ii. Section 9 of VM-20 requires anticipated policyholder behavior assumptions that are appropriate for the block of business being valued. The actuary should consider other assumptions of the valuation model when developing policyholder behavior assumptions.

iii. The actuary should consider whether it is reasonable to constrain assumed policyholder behavior to the outcomes and events exhibited by historical experience, especially when modeling policyholder behavior of a new product benefit or feature.

iv. Options embedded in the product, such as term conversion privileges or policy loans, may affect policyholder behavior. The actuary should consider that, as the value of a product option increases, the likelihood that policyholders will behave in a manner that maximizes their financial interest in the contract will increase (for example, lower lapses, higher benefit utilization, etc.).

v. Unless there is clear evidence to the contrary, the actuary should use anticipated policyholder behavior assumptions that are consistent with **relevant experience** and reasonable future expectations. At any duration for which relevant data do not exist, the actuary should consider using an action that will maximize the value of the policy from the point of view of a rational investor who owns the policy (i.e., lapse the policy, persist, take out a loan, etc.).

vi. 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.

vii. The actuary should consider using a **scenario**-dependent formulation for anticipated policyholder behavior. If the actuary chooses to use a model for anticipated policyholder

behavior that is not **scenario**-dependent, the actuary should demonstrate that the use of scenario-dependent assumptions is unlikely to result in a materially higher minimum reserve. For **risk factors** that are **scenario**-dependent, the actuary should incorporate a reasonable range of future expected behavior consistent with the economic **scenarios** and other variables in the model. In the absence of evidence to the contrary, modeling extreme behavior may not be necessary. However, the actuary should consider testing the sensitivity of results to understand the materiality of using alternate assumptions.

2) Premium Assumptions—For policies with fixed future premiums, the actuary should use an assumption that future premium payments on inforce policies will be paid in accordance with the policy provisions.

For policies with flexible premiums, the actuary, in designing assumptions about future premium payments, should consider such factors as the limitations inherent in the policy design, the amount of past funding of the policy, and the marketing of the policy. The actuary should consider using multiple premium payment pattern assumptions, for example, by subdividing the cell of business into several projection cells, each with a separate payment pattern assumption. If this is not done and consequently the cell has one average pattern, the actuary should consider using **sensitivity testing** to determine whether the estimates of reserves or risks are materially impacted by the use of such an approach.

While historical experience, when available, is often a good basis for such assumptions, the actuary should exercise care when assuming that past behavior will be indefinitely maintained. For example, market or environmental changes can make historical experience less relevant. Premium payment assumptions may also vary by interest rate **scenario**.

In setting premium assumptions, the actuary should consider the following marketing factors that may affect the level and continuation of premium payments:

i. emphasis on death benefits;

ii. emphasis on savings accumulation or tax advantages;

iii. emphasis on premium flexibility;

iv. policy illustrations showing premiums for a limited period;

v. automatic electronic payment of premiums;

vi. bonuses for higher premiums or assets; and

vii. other factors the actuary deems appropriate.

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

The actuary should consider the level of **granularity** in setting the premium assumption. It should be granular enough, in the actuary's judgment, to adequately reflect expected experience.

3) Partial Withdrawal and Surrender Assumptions—The actuary should consider using a **scenario**-dependent formulation for modeling partial withdrawals and surrenders that is responsive to factors such as the projected interest rate environment, the funding level, premium increases, and benefit triggers. In setting partial withdrawal and surrender assumptions, the actuary should consider the insured's age and gender, 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 that rates of surrender can rise materially after such an event.

d. Expenses—The actuary should review the expenses that have been allocated, for financial reporting purposes, in recent years to the block of policies being evaluated. The actuary should allocate expenses that are classified as "direct sales expenses" or as "taxes, licenses, and fees" to the activity creating the expense. All non-direct 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. The actuary should use this analysis as the basis for projecting expenses in doing the reserve valuation, unless, in the actuary's professional judgment, the expense experience is not a suitable basis for projection, in which case other sources of data may be used (as set forth in section (2) below).

1) Expense Inflation—Section 9 of VM-20 requires expenses to reflect the impact of inflation. The actuary should appropriately adjust unit costs in the projection for the effect of inflation. 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 also consider the assumption that future inflation rates will vary if prevailing new-money rates change. The actuary should review the resulting projection of implied "real return" to ensure that the inflation and investment return assumptions are consistent.

2) Applying Recent Expense Experience—In reviewing recent experience, the actuary should assure 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 actuary's professional judgment, a suitable basis for projection, the actuary may consider the use of experience on a closely similar type of policy within the company or intercompany studies.

   The actuary should consider including a provision for overhead that considers holding company expenses associated with running the life insurance business (for example, rent and executive compensation) that have not been recognized in other charges to or reimbursements from the life company.

   In developing expense assumptions, the actuary should include acquisition expenses and significant non-recurring expenses expected to be incurred after the **valuation date**, to the extent allocable to the business in force at the **valuation date**. The actuary should include provision for unusual future expenses that may be anticipated, such as severance costs or litigation costs.

   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 projections of direct sales expenses, the actuary should consider recent changes in company practice, such as changes in commission rates that may not have been fully reflected in the experience. The actuary's projection of taxes, licenses, and fees should be based on a reasonable activity base (such as premium).

The actuary should reflect recent changes in company practice, such as changes in staffing levels that could increase non-direct expenses in the projection. In the case of changes that are planned but not fully implemented, the actuary may consider reflecting in the projection the probability that the changes will increase future expenses.

e. Taxes—Section 9 of VM-20 requires the company to determine reserves using models in which federal income taxes are excluded from consideration. The actuary should separately recognize any taxes that are not included in the "taxes, licenses, and fees" item, other than federal income taxes, in the projection models.

f. Determining Assumption Margins—After the **anticipated experience assumptions** are established, the actuary should modify each assumption to include a **margin** for estimation error and moderately adverse deviation, except as indicated below. The actuary should incorporate an adequate **margin** in assumptions that are modeled dynamically (i.e., assumed to vary as a function of a stochastic assumption, such as lapse rates or nonguaranteed elements rates that vary in response to interest rates) throughout all variations.

1) Mortality Margins—Section 9 of VM-20 prescribes the **margins** that are to be added to the anticipated experience mortality assumptions but also requires the establishment of an additional **margin** if, in the actuary's professional judgment, the prescribed **margin** is inadequate. The guidance in the remainder of this section on determining assumption **margins** does not apply to the mortality assumptions.

2) Establishing Margins—The actuary should establish **margins** for a particular assumption if doing so increases the **minimum reserve**. If determining the directional impact is not practical, the actuary

need not establish a **margin** for that assumption.

The actuary need not include **margins** in assumptions for risks that are to be modeled stochastically as long as a moderately adverse proportion of the stochastically generated results is used for establishing the **stochastic reserve**.

For each assumption that includes a **margin**, the actuary should reflect the degree of risk and uncertainty in that assumption in determining the magnitude of such **margin**. When determining the degree of risk and uncertainty, the actuary should take into account the magnitude and frequency of fluctuations in **relevant 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**.

In determining the **margins** for policyholder behavior assumptions for which there is an absence of relevant and credible experience, the actuary should follow the guidance in section 9 of VM-20 of the *Valuation Manual* and consider the following:

i. experience trends by duration where there is relevant data; and

ii. the expectation that experience will change in the future due to policy features, economic conditions, or other factors.

According to section 9 of VM-20, the actuary does not need to consider the **margin** at every duration but should consider the impact of the resulting **margins** on the reserve in the aggregate.

The actuary should establish **margins** such that the additive impact for all assumptions is at a level that, in the actuary's professional judgment, provides for an appropriate amount of adverse deviation in the aggregate, even if the **margin** for an individual assumption does not appear adequate on a stand-alone basis (see also section below on "Overall Margins").

3) Sensitivity Testing—The actuary should consider using **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**.

4) Overall Margins—The actuary should compare the **minimum reserves** based on **prudent estimate assumptions** with the **minimum reserves** based on anticipated experience (**minimum reserves** without **margins**) for a group of policies. For this purpose, "group of policies" may mean a line of business, or the actuary may make the comparison on several groups of policies within a line of business. The actuary should set overall **margins** such that the **minimum reserves** with **margins** are greater than the **minimum reserves** without **margins** by an amount that is consistent with the risk on the group of policies and the regulatory requirements for reserves. In evaluating consistency, the actuary may, for example, relate overall **margins** to a percentage of the present value of risk capital requirements on the group of policies, consider the conditional tail expectation level implied by the **minimum reserves** based on **prudent estimate assumptions**, or consider historical variations in experience.

5) Adjusting Reserves—The actuary should increase the **minimum reserve** if, in the actuary's professional judgment, the difference between **minimum reserves** with and without **margins** is inadequate. This may be accomplished by changing the assumption **margins** or by adjusting the total **minimum reserves** for the group of policies and using a reasonable method to allocate the difference to individual policies.

3.5 Reinsurance—This section applies to reserves for policies ceded or assumed under the terms of a reinsurance agreement. The terms "reinsurance" and "reinsurer" include retrocession and retrocessionaire, respectively.

3.5.1 Stochastic and Deterministic Reserves Under Reinsurance—According to section 8 of VM-20, the **deterministic reserves** and **stochastic reserves** shall be based on assumptions and models that project cash flows that are net of reinsurance ceded. Thus, the actuary should use cash flows that reflect the effects of reinsurance assumed and ceded when calculating **stochastic reserves** and **deterministic reserves**.

The actuary should not calculate the **stochastic reserve** or **deterministic reserve** by deducting a formulaic reinsurance credit (such as the Statement of Statutory Accounting Principles No. 61 reserve credit) from a **stochastic reserve** or **deterministic reserve** that is based on hypothetical pre-reinsurance cash flows as discussed in section 3.5.2 below, unless the actuary can reasonably assume that such a procedure would produce a reserve that does not materially differ from a directly calculated **stochastic reserve** or **deterministic reserve**.

3.5.2 Pre-Reinsurance-Ceded Minimum Reserve—Section 8 of VM-20 requires a pre-reinsurance-ceded **minimum reserve**, if needed, to "…be calculated pursuant to the requirements of this *Valuation Manual* VM-20, using methods and assumptions consistent with those used in calculating the **minimum reserve**, but excluding the effect of ceded reinsurance," using assumptions that "…represent company experience in the absence of reinsurance, for example assuming that the business was managed in a manner consistent with the manner that retained business is managed." Determining the **minimum reserve** requires the calculation on a pre-reinsurance-ceded basis of all necessary reserve components, which may include a **net premium reserve**, a **deterministic reserve**, a **stochastic reserve**, and the application of any exclusion tests. In arriving at the assumptions for use in the **cash flow model** required for **deterministic reserve** and **stochastic reserve** calculations, the actuary should consider using assumptions for the ceded business that are consistent with those used for retained business of the same kind (reflecting any known differences, such as differences in average policy size).

The calculation of pre-reinsurance-ceded **minimum reserves** requires an estimate of the investment return earned on ceded assets. Possible methods for estimating this hypothetical investment return include the following:

a. basing the estimate on the investment return on assets available at the time the cash flows were ceded;

b. assuming the estimate is equal to the investment return used for retained policies of the same kind; and

c. assuming the estimate is equal to the investment return on a pro rata slice of the assets of the reinsurer that back the ceded reserve.

3.5.3 Reserve Credit—According to section 8 of VM-20, the reserve credit is the difference between the pre-reinsurance-ceded **minimum reserve** and the post-reinsurance-ceded **minimum reserve**. The actuary should apply the exclusion criteria and formulas of section 2 of VM-20 separately for each of these **minimum reserves** and should apply the guidance of this standard to calculate any needed **stochastic reserve** or **deterministic reserve** component. The actuary should be aware that the reserve credit might not be the difference between the pre- and post-reinsurance-ceded versions of the same reserve component; for example, the reserve credit could be the pre-reinsurance-ceded **stochastic reserve** less the post-reinsurance-ceded **deterministic reserve**.

3.5.4 Recognition of Reinsurance Cash Flows in the Deterministic Reserve or Stochastic Reserve—VM-20 requires the calculation of the **deterministic reserve** or **stochastic reserve** to use assumptions and **margins** that are appropriate for

each company involved in a reinsurance agreement. The two parties to the agreement are not required to use the same assumptions and **margins** for the reinsured policies.

The actuary should choose assumptions for projecting cash flows for assumed reinsurance and for ceded reinsurance that consider all aspects of applicable reinsurance agreements, including all elements of the agreements that the assuming company can change (such as changes to the current scale of reinsurance premiums and changes to expense allowances) and all actions either party may take that could affect the reinsurance cash flows (such as changes by the ceding company in non-guaranteed elements or the recapture of ceded policies). The actuary should consider whether such changes depend on the economic **scenario** being modeled.

a. In modeling nonguaranteed elements, the actuary may consider any limits placed upon the reinsurer's ability to change the terms of the treaty, including the presence or absence of guarantees of reinsurance premiums and allowances; known actions of the ceding company, such as changes in dividend scales; known past practices of reinsurers in general and the assuming reinsurer in particular regarding the changing of such terms; and the ability of the ceding company to modify the terms of the reinsured policies in response to changes in the reinsurance agreement.

b. The actuary should consider any actions that have been taken or appear likely to be taken by the ceding company, or direct writer, if different, that could affect the expected mortality or other experience of assumed policies. Examples of such actions include internal replacement programs and table-shave programs.

c. The actuary should choose assumptions and **margins** assuming that all parties to a reinsurance agreement are knowledgeable of the terms of the reinsurance agreement and will exercise options to their advantage, taking into account the context of the agreement in the entire economic relationship between the parties.

d. In applying the considerations in paragraphs a, b, and c above, the actuary should take into account the impact of the economic conditions inherent in the **scenario** being modeled.

e. Section 8 of VM-20 requires the use of stochastic modeling or analysis "to the extent that a single deterministic valuation assumption for **risk factors** associated with certain provisions of reinsurance agreements will not adequately capture the risk." A Guidance Note in section 8 of VM-20 identifies stop-loss reinsurance as an example of such a provision. The

actuary should consider the distribution of claims for the coverage provided under the provisions of the reinsurance agreement to determine whether and to what extent a single deterministic valuation assumption adequately captures the risk.

Stochastic modeling of **risk factors** for which a single deterministic valuation assumption is inadequate may be introduced directly in the **cash flow model**, or a separate stochastic analysis outside the model may be performed. In deciding between these approaches, the actuary should consider the degree to which a separate stochastic analysis of **risk factors** should interact with the variables in the **cash flow model**. When there is a high degree of interaction, the actuary should consider incorporating the analysis directly into the **cash flow model**. In setting **margins** for such **risk factors**, the actuary should take into account any **margins** created by the stochastic modeling method (such as the **margin** created by a conditional tail expectation method). If the **risk factor** is subject to significant fluctuation, the actuary should consider using a stochastic modeling method that provides an adequate **margin**.

3.5.5 Margin for Risk of Default by a Counterparty—Section 8 of VM-20 requires the company to establish a **margin** for the risk of default if the company has knowledge that a counterparty is financially impaired. In the absence of such knowledge (or if the impact on cash flows is insignificant) no such **margin** is required. In determining whether the company has knowledge of such impairment of a counterparty, and in determining the risk margin for counterparty default if one is needed, the actuary may rely upon information provided by appropriate persons employed or retained by the company.

3.5.6 Reinsurance Agreements that Do Not Qualify for Credit for Reinsurance—Section 8 of VM-20 states, "If a reinsurance agreement or amendment does not qualify for credit for reinsurance, but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the **minimum reserve** by the absolute value of such reductions in surplus." The impact on surplus may be ascertained by calculating the **minimum reserve** with and without reflection of the non-qualifying reinsurance agreement or amendment. If the actuary concludes that such calculations are unnecessary, the actuary should document the testing and logic leading to that conclusion.

3.5.7 Assets Held by the Counterparty or Another Party—If, under the terms of the reinsurance agreement, some of the assets supporting the reserve are held by the counterparty or another party, the actuary should determine whether such assets should be modeled to properly determine discount rates or projected cash flows. If the actuary concludes that modeling is unnecessary, the actuary should document

the testing and logic leading to that conclusion.

3.6 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 and ASOP No. 41, *Actuarial Communications*, for guidance. In addition, where the actuary relies on others for data, assumptions, projections, or analysis in determining the **principle-based reserves**, the actuary should comply with specific requirements of the *Valuation Manual*.

3.7 Documentation—The actuary should create records and other appropriate documentation supporting the valuation. To the extent practicable, the actuary should take reasonable steps to support the retention of this documentation for a reasonable period of time (and no less than the length of time necessary to comply with any statutory, regulatory, or other requirements). The actuary need not retain the documentation personally; for example, the actuary's employer may retain it.

Section 2 of VM-31 states, "The PBR actuarial report must include documentation and disclosure sufficient for another actuary qualified in the same practice area to evaluate the work." The actuary should include the rationale for all significant decisions made and information used by the insurer in complying with the **minimum reserve** requirements and in compliance with the minimum documentation and reporting requirements set forth in the *Valuation Manual* with respect to the PBR actuarial report.

Section 2 of VM-31 further requires the insurer to retain on file for at least seven years from the date of filing sufficient documentation so that it will be possible to determine the procedures followed, the analyses performed, the bases for assumptions, and the results obtained in a **principle-based valuation**. It also requires the insurer to submit a PBR actuarial report to a commissioner upon request.

Section 4. Communications and Disclosures

4.1 Actuarial Communications—When issuing actuarial communications under this standard, the actuary should refer to ASOP Nos. 23 and 41. In addition, the actuary should refer to ASOP No. 21, *Responding to or Assisting Auditors or Examiners in Connection with Financial Statements for All Practice Areas*, where applicable.

The actuary should be aware of the requirements of VM-31.

4.2 Actuarial Report—The actuarial report is prepared under the direction of, and signed by, one or more qualified actuaries, as required by VM-31. Section 3 of VM-31 prescribes the content of this report and other requirements.

Where applicable, the actuary should disclose the following items in the actuarial report as discussed in further detail in section 3:

a. demonstration supporting the exclusion test (see section 3.3);

b. exclusion test grouping (see section 3.3.1);

c. differences in model results from existing internal system results (see section 3.4.1(c));

d. results of tests of model **granularity** (see section 3.4.1(d)(1));

e. use of an as-of date for assumptions or data that is prior to the **valuation date** (see section 3.4.1(e));

f. demonstration supporting the use of non-scenario dependent policyholder behavior assumptions (see section 3.4.2(c)(1)(vii));

g. the rationale for not calculating the impact on surplus of non-qualifying reinsurance agreements (see section 3.5.6);

h. the rationale for not modeling assets held by a counterparty or another party (see section 3.5.7); and

i. details such that another **qualified actuary** working in the same practice area could evaluate the work (see section 3.7).

4.3 Disclosures—The actuary should include the following, as applicable, in an actuarial communication:

a. 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);

b. the disclosure in ASOP No. 41, section 4.3, if the actuary states reliance on other sources and thereby disclaims responsibility for any material assumption or method selected by a party other than the actuary; and

c. the disclosure in ASOP No. 41, section 4.4, if in the actuary's professional judgment, the actuary has otherwise deviated materially from the guidance of this ASOP.

Appendix 1

Background and Current Practices

Note: This appendix is provided for informational purposes and is not part of the standard of practice.

Background

Principle-based reserving for life insurance policies is a new field of endeavor for actuaries, and accepted methods of practice are expected to emerge as experience in the field develops. New developments will arise and be published in practice notes or other types of actuarial literature.

Prior to 1980, the regulation of life insurance statutory reserves was very stable, with only occasional changes in the statutory interest rates and mortality tables. For many years, there were no significant changes in the basic approach. After 1980, interest rate volatility of unprecedented magnitude, as well as the increasing popularity of new policy types that did not fit easily into the existing structure, began to cast doubt on the approach that was being used.

In response to the problem, changes were introduced, including the adoption of dynamic statutory valuation interest rates, the use of cash flow testing of reserves, and a number of adaptations of minimum reserve requirements to provide formulas appropriate for different policy types. It became increasingly difficult to modify the existing structure to keep up with changing conditions.

In addition, the statutory factors for interest and mortality were designed to produce reserves that were high enough to cover a wide variety of situations and thus were viewed as unnecessarily conservative for many companies. It was also evident that some risk factors were not explicitly addressed in the statutory approach, such as the variety of choices open to policyholders (i.e., the items generally grouped under the heading of “policyholder behavior”) and also the level and pattern of insurance company expenses. These risk factors have a significant impact on reserve adequacy.

The formulaic nature and prescriptive assumption set of statutory valuation techniques worked well for many years. However, as insurance products increased in complexity, and as new and innovative product designs were developed that changed the insurer’s risk profile, it became apparent that revised regulations and numerous actuarial guidelines were not the best solution for the industry as a whole. On the insurance regulatory side, the National Association of Insurance Commissioners (NAIC), state commissioners, and insurance departments faced the challenge of maintaining the solvency objective of statutory reporting while creating a valuation platform that could be maintained efficiently, enhance uniformity among the states, persist into the future, and remain appropriate for all types of insurance products under various economic conditions.

Thus, there were many reasons for considering the need for radical changes in the statutory reserving system. In many other countries, programs for change had already been under way for some time. In the United States, the proposed new approach has been given the name of "principle-based reserves," and it requires that reserve calculations make use of a company's own experience, when credible, that they recognize the impact of all material risk factors, and that reserve margins be appropriate to the risk in the product. The phrase "principle-based reserves" is quite broad and could apply to many different types of reserves.

Committees within the actuarial profession have been at work recommending the detailed regulatory provisions needed to implement principle-based reserving. The Life Practice Council of the American Academy of Actuaries has developed a draft practice note with respect to principle-based reserving. The need was also recognized for an actuarial standard of practice that would accompany the regulatory effort and would provide additional guidance to the actuary who was preparing principle-based reserves.

The proposed regulatory structure for principle-based reserves is intended to be consistent with the objectives of statutory financial reporting, which emphasize solvency for the protection of policyholders. In addition to statutory reserves, the insurer is also required to hold additional assets, known as "risk-based capital." These reserves and risk-based capital are intended to create an adequate margin of safety to ensure that policyholder obligations and other legal obligations will be met when they come due.

Current Practices

Since its introduction in the 1980s, cash flow testing has become a well-established technique in most life insurance companies. ASOP No. 7, *Analysis of Life, Health, or Property/Casualty Insurer Cash Flows*, gives guidance on this technique. The current proposals for principle-based reserve regulations use cash flow testing as a component of the recommended approach.

The adoption of the *Actuarial Opinion and Memorandum Regulation* in 1991, together with ASOP No. 22, *Statement of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*, made it mandatory for larger companies to use one or more of a set of techniques (collected under the general heading of "asset adequacy analysis") in testing for adequacy of reserves in light of the assets supporting them. Foremost among these techniques was cash flow testing. Asset adequacy analysis was designed as an aggregate test to determine whether the insurer should establish reserves in excess of the statutory minimums and includes methods of quantifying this amount. To a degree, these same techniques are paralleled in the determination of certain components of a principle-based valuation.

Appendix 2

Comments on Exposure Draft and Responses

The exposure draft of this proposed ASOP, *Principle-Based Reserves for Life Products*, was issued in June 2013 with a comment deadline of December 16, 2013. Seven comment letters were received, some of which were submitted on behalf of multiple commentators, such as by firms or committees. For purposes of this appendix, the term "commentator" may refer to more than one person associated with a particular comment letter. The Principle-Based Reserve Task Force carefully considered all comments received, reviewed the exposure draft, and proposed changes. The Life Committee and the ASB reviewed the proposed changes and made modifications where appropriate.

Summarized below are the significant issues and questions contained in the comment letters and responses.

The term "reviewers" in appendix 2 includes the Principle-Based Reserves Task Force, the Life Committee, and the ASB. Also, unless otherwise noted, the section numbers and titles used in appendix 2 refer to those in the exposure draft.

GENERAL COMMENTS	
Comment	One commentator asked for more guidance related to the calculation of the net premium reserve (NPR) and identified several areas where additional guidance would be helpful (shadow accounts, universal life secondary guarantee, ceded reinsurance credits, etc.).
Response	The reviewers note that the calculation of the NPR is outside the scope of this standard and made no change.
Comment	One commentator suggested that if the pre-tax interest maintenance reserve (PIMR) instructions in the current draft of VM-20 are not amended, additional guidance on the PIMR calculation would be helpful.
Response	The reviewers understand that there is currently a proposal to amend VM-20 with respect to PIMR and will consider whether any changes to this ASOP should be made following resolution of that proposal.
Comment	One commentator asked for clarification of an appropriate assumption for the "working reserve" noting that the term is not used in VM-20 but is used in RBC C3 Phase 3.
Response	The reviewers believe that clarifying an assumption not mentioned in this standard for the purpose indicated is outside the scope of this ASOP and, therefore, made no change.
Comment	Two commentators pointed out that VM-20 is an evolving document and, even after it is adopted, revisions may be frequent, suggesting that a process for revising the standard in response is needed.
Response	The reviewers agree that changes to the *Valuation Manual* may require changes to this ASOP. At this time, the ASB plans to update this ASOP, if needed, using existing processes.

Comment	One commentator suggested that guidance be included to address the difficulties companies could have when reporting practices (segments, etc.) apply to both PBR and non-PBR reserves.
Response	The reviewers believe that this subject would be more suitable in a practice note. Therefore, the comment was referred to the Life Practice Council for consideration.
Comment	One commentator recommended clarifying that the *Valuation Manual* requires compliance from the company, whereas this ASOP provides guidance to actuaries.
Response	The reviewers agree with this recommendation and added language to section 1 and the transmittal memorandum.
TRANSMITTAL MEMORANDUM QUESTIONS	
Question 1: The text sometimes repeats or summarizes material in VM-20 to the extent needed to clarify the guidance. Is this overdone or, conversely, should there be more of it?	
Comment	In general, commentators thought that the repetition of material from VM-20 was overdone. Enhancements ranging from complete elimination of all repetition to limiting the repetition to only those areas where additional guidance is being provided were suggested. It was also suggested that, when material is being extracted from VM-20, it be clearly identified.
Response	The reviewers reviewed the material in the exposure draft that was repeated or summarized from VM-20 and either eliminated the material or, if it was determined that the material was helpful to the user, made some wording changes to clarify that the material was from VM-20. In particular, major changes were made in sections 3.3, 3.7, and 3.7.1. Section 3.5.4 was eliminated entirely. Significant changes were also made in several other sections, including 3.1, 3.4, 3.5.1, 3.5.2, 3.5.6, 3.6, 3.7.2, 3.7.3, and 3.7.4.
Question 2: Is the guidance provided, particularly in the areas listed below, clear and appropriate? If not, what specific changes do you suggest? • **making updating adjustments when data prior to the valuation date is used;** • **doing stochastic analysis of nonproportional reinsurance;** • **grouping policies into modeling cells; or** • **deciding on model granularity.**	
Comment	Most commentators responding to this question felt that the guidance in the areas identified could be clarified and, in some cases, strengthened and made suggestions about how to do so.
Response	The reviewers made a number of changes to the pertinent sections of the exposure draft (principally sections 3.5.6 and 3.6.3) to incorporate those suggestions as appropriate.
Question 3: Is this standard of practice appropriately prescriptive?	
Comment	Commentator responses to this question were sparse but evenly divided.
Response	The reviewers considered the prescriptiveness of each specific element of guidance and, in some instances, made changes.
Question 4: If adopted, do you feel that this standard of practice provides adequate guidance for actuaries responsible for determining principle-based reserves? If not, what changes would you suggest?	
Comment	Commentator responses to this question were sparse but evenly divided.
Response	The reviewers adjusted the guidance based on all of the comments received and believe that, by so doing, the guidance provided is improved.

SECTION 1. PURPOSE, SCOPE, CROSS REFERENCES, AND EFFECTIVE DATE	
Section 1.2, Scope	
Comment	One commentator suggested that the scope of the standard clearly indicate that it applies only to the products covered by VM-20.
Response	The reviewers agree and adjusted the wording to make it clear that the products in scope are only those covered by VM-20.
SECTION 2. DEFINITIONS	
Section 2.2, Asset Segmentation Plan	
Comment	One commentator suggested that this definition be changed or eliminated because it is inconsistent with VM-20.
Response	The reviewers changed the definition to make it consistent with VM-20.
Section 2.4, Credibility	
Comment	One commentator suggested the parenthetical phrase indicating that the word "predictive" is being used in the statistical sense be removed.
Response	The reviewers note that this phrase was included so that this definition was consistent with that in ASOP No. 25, *Credibility Procedures* and, therefore, made no change.
Section 2.5, Deterministic Reserves	
Comment	One commentator suggested adding "in accordance with the valuation manual."
Response	The reviewers agree that this suggestion enhanced the definition and therefore made the change.
Section 2.6, Granularity	
Comment	One commentator suggested removing the second sentence of the definition, which provided commentary on the characteristics of models with different levels of granularity.
Response	The reviewers agree that the comments were not appropriate in the definition and deleted the sentence.
Section 2.7, Margin	
Comment	One commentator suggested that the definition of "Margin" in VM-20 should be used here.
Response	The reviewers agree that the alignment of this definition with that in VM-20 was appropriate and made some changes to bring the definitions closer.
Section 2.10, Modeling Cell	
Comment	One commentator suggested defining the term "model cell" rather than "modeling cell."
Response	The reviewers note that the term "modeling cell" is specifically used in VM-20 section 7.B.2 and decided that no change was appropriate.
Section 2.14, Principle-Based Valuation (now 2.13)	
Comment	One commentator suggested that the definition of "principle-based valuation" should be consistent with that in VM-01.
Response	The reviewers agree and changed the definition to match that in VM-01.
Section 2.16, Qualified Actuary (now 2.15)	
Comment	One commentator recommended removing the definition of "qualified actuary."
Response	The reviewers believe it is appropriate to leave this definition in the standard but adjusted the wording to make the definition more like that in VM-01.

Section 2.18, Risk Factor (now 2.17)	
Comment	One commentator suggested removing asset return from the examples in the definition of risk factors because it was not a risk factor.
Response	The reviewers disagree and made no change.
Section 2.21, Starting Assets (now 2.20)	
Comment	One commentator suggested revising the definition of "starting assets" to make it more consistent with section 7.D.1. of VM-20
Response	The reviewers agree and made wording changes to align the definition.
Section 2.23, Valuation Date (now 2.22)	
Comment	One commentator suggested using wording consistent with the definition in VM-01.
Response	The reviewers believe that the wording in VM-01 ("Date when the reserve is to be valued") is less clear than the "Date as of which…" in the exposure draft and, therefore, made no change in response to this comment.
SECTION 3. ANALYSIS OF ISSUES AND RECOMMENDED PRACTICES	
Section 3.1, The Role of the Actuary (deleted)	
Comment	One commentator noted that VM-20 applies to companies, yet the standard applies to actuaries.
Response	The reviewers agree and changed the scope section to incorporate the general comment that VM-20 applies to companies, whereas this standard applies to actuaries.
Section 3.2, Regulatory Requirements (now 3.1)	
Comment	One commentator suggested using "actuarial services," as defined in ASOP No. 1, *Introductory Standard of Practice*, instead of the term "professional services" in this section.
Response	The reviewers agree and made the change throughout the standard.
Section 3.4, Exclusion Tests (now 3.3)	
Comment	One commentator suggested "economic capital measurement" instead of "internal capital measurement."
Response	The reviewers agree and made this change in addition to the more extensive changes resulting from the responses to question 1 posed in the transmittal memorandum for the exposure draft.
Section 3.5.1, Cash Flow Model (now 3.4.1(a))	
Comment	One commentator objected to the use of the term "asset segmentation plan." Two commentators felt that projections need only go so far as "material" obligations remain.
Response	The reviewers considered these comments but note that the language used is consistent with VM-20 and on that basis retained the material without change.
Section 3.5.2, Model Segments (now 3.4.1(b))	
Comment	One commentator suggested clarification of what is meant by "appropriate" in connection with "assignment of policies with offsetting risks to the same model segment."
Response	The reviewers agree and added a parenthetical to clarify "appropriate" in this context.
Section 3.5.3, Model Validation (now 3.4.1(c))	
Comment	One commentator suggested adding guidance on the model checking procedures.
Response	The reviewers agree and added more detail to this section.
Comment	One commentator suggested that margins could disrupt validation checks.
Response	The reviewers believe that validation checks can be structured in a way to adjust for the margins and, therefore, made no change.

Comment	One commentator suggested that this section should specifically except the application of model validation procedures when no model is used, for example, if a group of policies passes the exclusion tests.
Response	The reviewers believe the section as written would not require validation of a model if no model was used and, therefore, made no change.
Section 3.5.4, Asset Modeling Considerations (deleted)	
Comment	Several commentators suggested that sections that unnecessarily summarize material from VM-20 be deleted.
Response	The reviewers agree and deleted this section.
Section 3.6(a), Minimum Reserve and Reinsurance (now 3.5.1, Stochastic and Deterministic Reserves under Reinsurance)	
Comment	Several commentators believed that it would be appropriate to strengthen and clarify the guidance with respect to reinsurance.
Response	The reviewers changed the title and made other changes to be consistent with the changes made in subsections of section 3.6 in response to comments.
Section 3.6(b), Determination of a Pre-Reinsurance-Ceded Minimum Reserve (now 3.5.2, Pre-Reinsurance-Ceded Minimum Reserve)	
Comment	Two commentators suggested clarifying the relation between post-reinsurance and pre-reinsurance reserves, including the selection of assets for pre-reinsurance calculations.
Response	The reviewers made extensive changes in this subsection and the following one to clarify the guidance being made with respect to pre- and post-reinsurance reserves.
Section 3.6(c), Reinsurance Assumptions for Projecting Cash Flows (now 3.5.4, Recognition of Reinsurance Cash Flows in the Deterministic Reserve or Stochastic Reserve)	
Comment	One commentator thought that more guidance should be given on stop-loss contracts.
Response	The reviewers clarified the guidance with respect to stochastic analysis of stop-loss reinsurance contracts and contracts with similar risks.
Comment	One commentator suggested making it clear that stochastic analysis is not mandatory in evaluating reinsurance cash flows.
Response	The reviewers agree and added language to clarify that stochastic analysis is not mandatory.
Section 3.7, Assumptions (now 3.4.2)	
Comment	One commentator suggested that the actuary should consider the relevance of a company's experience in establishing assumptions, rather than limit consideration to "recent experience" as suggested by the exposure draft. Additionally, the term "credible" may not have been appropriately used in this subsection.
Response	The reviewers agree and modified the language accordingly.
Section 3.7.1, Mortality (now 3.4.2(a))	
Comment	One commentator made several suggestions to clarify the guidance with respect to evaluating experience for the purpose of establishing appropriate mortality assumptions.
Response	The reviewers agree that the suggestions enhanced the guidance and incorporated them into this section.
Section 3.7.6(b), Modifying Assumptions (now 3.4.2(f)(2), Establishing Margins)	
Comment	One commentator suggested changes in the procedures for establishing margins for policyholder behavior in the absence of relevant and fully credible experience.
Response	The reviewers agree with this suggestion and modified the guidance accordingly.

Comment	One commentator questioned whether sufficient guidance is being provided with respect to evaluating which assumptions should be modeled stochastically versus evaluated using sensitivity testing or through (increasing) margins. This section was specifically identified as an area where such guidance would be helpful.
Response	The reviewers incorporated additional guidance where appropriate to address this concern; however, there was no change made in this specific section in response to the concern expressed.
Section 3.7.6(d), Overall Margins (now 3.4.2 (f)(4))	
Comment	One commentator suggested additional approaches to evaluating overall margins, such as looking at the conditional tail expectation implied by the prudent reserve and historical variations in experience.
Response	The reviewers agree and added these examples.
Comment	One commentator suggested that additional guidance be provided with respect to the meaning of the terms “moderately adverse” and “adequate margin.”
Response	The reviewers believe the guidance with respect to these terms is sufficient and therefore made no change.