



AMERICAN ACADEMY *of* ACTUARIES

Update on Actuarial Guideline PBR from the American Academy of Actuaries' Life Reserves Work Group

Presented to the National Association of Insurance Commissioners' Life and Health Actuarial Task Force

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ACTUARIAL GUIDELINE PBR

[Drafting note: It may be that some of the material presented in this document would be better placed or restated in an Actuarial Standard of Practice ("ASOP"). The LRWG has been in contact with the Actuarial Standards Board ("ASB") to discuss the need for one or more ASOPs to complement this effort. While the right to issue Actuarial Standards of Practice and to determine their content rests exclusively with the ASB, we anticipate that the ASB will be willing to work cooperatively with the work group and the NAIC to develop appropriate ASOPs to support principles-based reserving.]

DETERMINING VALUATION ASSUMPTIONS FOR PRINCIPLES-BASED LIFE INSURANCE PRODUCTS

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I. General

The purpose of this Actuarial Guideline is to specify the requirements and methods to establish the assumptions used to determine reserves for policies subject to the Principles-based Reserves for Life Products Model Regulation (referred to throughout this document as the "Model Regulation."). Reserve assumptions for Individual Life Policies, supplemental benefits, and riders on these policies that are not directly identified in the scope are to be determined on a basis that is consistent with the principles and methodologies defined in this Guideline.

The company is expected to provide the Qualified Actuary with the necessary information sufficient to permit the actuary to fulfill the responsibilities set forth in this Guideline and responsibilities arising from applicable guidelines and Actuarial Standards of Practice.

II. Definitions

All definitions except those listed below are specified in the Model Regulation.

NGE Re-determination Margin: The margin or spread between Best Estimate assumptions and the anticipated future non-guaranteed elements. At issue, the Re-determination Margin is equal to the pricing margin used to develop non-guaranteed elements. After issue, the Re-determination Margin may change based on current Best Estimate assumptions and the Company's current non-guaranteed element practices.

III. Specific Guidance and Requirements for Setting Valuation Mortality Assumptions

A. Background:

The approach for setting the valuation mortality assumptions is intended to balance the reflection of company experience and the use of prescribed version of a commissioner's standard valuation table, based on the availability of relevant experience and its degree of credibility. This approach is intentionally inconsistent with Guiding Principle 5 as outlined in the Model Regulation to be more consistent with current tax requirements and has the benefit of providing regulators greater control by using a specified valuation mortality table. The disadvantage of this approach is that it may reduce the effectiveness of using company experience to the extent credible, particularly when company experience follows a mortality pattern different than that underlying the valuation tables.

B. Overview

1. Intent. The guidance and requirements in this section apply for setting the valuation mortality assumptions when determining the Stochastic Reserve or the Deterministic Reserve. The intent is for valuation mortality assumptions to be based on facts, circumstances and appropriate actuarial practice (where more than one approach to appropriate actuarial practice exists, the actuary should select the practice that the actuary deems most appropriate under the circumstances).
2. Description. Valuation mortality assumptions are determined as outlined in the steps below. Steps a-c are intended to result in a Prudent Best Estimate mortality assumption. Steps d-e are then used to develop the final valuation mortality assumptions based on a defined valuation table.
 - a. Develop experience mortality curves based on either a company's own available experience or other relevant experience (using the guidance and requirements in subsection C below).
 - b. Using industry mortality experience, adjust the experience mortality curves reflecting the credibility of the experience used to determine the experience mortality curve (using the guidance and requirements of subsection D below.)

[Drafting Note: Industry mortality tables should be approved by the National Association of Insurance Commissioners (NAIC) for statutory reserves. The industry table is based on mortality experience used to develop statutory valuation tables; however, without Margins. Adjustments to this table for recent industry experience approved for use by the NAIC. The resulting table is without mortality Margins as mortality Margins are added in step c below.]

- c. Adjust the mortality curves to include a reasonable Margin.
 - d. Once a Prudent Best Estimate mortality assumption is determined, the actuary must determine the version of the valuation mortality table that produces a Reported Reserve closest to but not less than the Reported Reserve using the Prudent Best Estimate mortality assumption.
 - e. Adjust the mortality curves for impaired lives or if there is reasonable expectation that policyholder behavior will likely lead to mortality results which vary from underlying valuation table as determined in step d. An example of this would be increased mortality due to high lapses due to a significant increase in policyholder costs. Subsection G below addresses guidance and requirements for adjusting mortality curves.
3. Margins. The experience mortality curves that are determined in subsection B may need to include a Margin. This Margin is not an adjustment for credibility described in section subsection C. The Margin could be in the form of an increase or a decrease in mortality, depending on the business segment under consideration. The Margin shall be applied in a direction (i.e., increase or decrease in mortality) that results in a higher reserve. A sensitivity test may be needed to determine the appropriate direction of the Margin. The test could be a prior year mortality sensitivity analysis of the business segment or an examination of current representative cells of the segment. For purposes setting this assumption, if mortality must be increased (decreased) to provide a Margin the business segment is referred to as a plus (minus) segment. For life insurance products offered today, minus segments are uncommon, however, given these segments may exist for future designs, the actuary should consider the benefits offered and the impact of the mortality assumption when determining reserves for these types of benefits. It may be necessary, because of changes in the mortality risk profile to reclassify a business segment from a plus (minus) segment to a minus (plus) segment to the extent compliance with this subsection requires such a reclassification.

C. Determination of Experience Mortality Curves

1. Actual Experience Data. In determining experience mortality curves the ~~actuary company~~ shall use actual experience data directly applicable to the business segment (i.e., ~~the company's actual own direct~~ data) if it is available. In the absence of ~~a company's actual own direct~~ data that is directly applicable to the business segment, the ~~actuary company~~ should then look to use data from another segment that is consistent with the business segment (~~i.e., other than direct experience~~). See paragraph 4, below for additional considerations. Finally, if there is no data, the ~~actuary company~~ shall use the applicable table, as defined in subsection D.1 below. Actual eExperience data should be updated within reasonable timeframes. More frequent updates may be prudent for newer blocks of business or blocks of business with greater uncertainty.
2. Data Other than Actual Direct Experience. If experience mortality curves for a business segment are being determined using data consistent with the business segment but is not based on the actual experience directly applicable to the business segment, (~~whether or not the business segment is from the company directly written by the company~~), the actuary shall document any similarities or differences between the two business segments (e.g., type of underwriting, marketing channel, average policy size, etc.) and the adjustments applied. The actuary must document the appropriateness of using these tables and opine on the appropriateness of the table construction including underlying experience data, credibility of experience, appropriateness of late duration and older age mortality assumptions and other relevant information considered when selecting the assumption. Margins shall be applied to the experience mortality curves to reflect any data uncertainty and adjustments shall be applied to reflect differences between the business segments.
3. Adjustments: The actuary may also reflect the effects of risk selection and underwriting practices not reflected in the underlying experience when supported by relevant published medical and clinical studies. No adjustment should be made beyond the ~~period of time~~ duration supported by these studies.

[Drafting note: Further guidance will be added to the Guideline.]

4. Additional Considerations Involving Data. The following considerations shall apply to mortality data specific to the business segment for which assumptions are being determined (i.e., actual experience direct data discussed in subsection 1A) above, or other than actual experience direct data discussed in subsection 2B) above). Within a business segment, mortality assumptions for direct and ceded business should be consistent.
 - a. **Experience by policy duration.** If internal mortality data is available for a certain business segment for a limited number of durations or issue ages the company shall grade into the appropriate industry mortality table over a reasonable period of time.
 - b. **Modification and Relevance of data.** Even for a large company the quantity of life exposures and deaths ~~is are~~ such that a significant amount of smoothing may be required to determine experience mortality curves from the underlying experience. Experience mortality curves, when applied to the recent historic exposures (e.g., 3 to 7 years), should not result in an estimate of aggregate number of deaths less (greater) than the actual number deaths during the exposure period for plus (minus) segments. If this condition is not satisfied, the actuary must document the rationale in support of using expected mortality that differs from recent mortality experience.

In determining experience mortality curves (and the credibility of the underlying data), older data may no longer be relevant. The “age” of the experience data used to determine experience mortality curves ~~should~~ shall be documented.
 - c. **Other considerations.** In determining experience mortality curves, consideration should be given to factors that include, but are not limited to, trends in mortality experience, trends in exposure, volatility in year-to-year A/E mortality ratios, mortality by lives relative to mortality by amounts, changes in the mix of business and product features that could lead to mortality selection.

D. Adjustment for Credibility to Determine Prudent Best Estimate Mortality

1. Adjustment for Credibility. The experience mortality curves determined in subsection C) shall be adjusted based on the credibility of the experience used to determine the curves in order to arrive at Prudent Best Estimate mortality assumption. The adjustment for credibility shall result in blending the experience mortality curves with an industry mortality table specified as the 2001 VBT table (or other tables adopted

by the NAIC for this purpose) adjusted in a manner approved for use by the NAIC to reflect for the most recent Society of Actuaries intercompany study approved for use by the NAIC.¹

2. Adjustment of Industry Mortality for Improvement. For purposes of the adjustment for credibility, the industry mortality table for a plus segment may be; and the industry mortality table for a minus segment must be; adjusted for mortality improvement. Such adjustment shall reflect applicable published industrywide experience from the effective date of the respective industry mortality table to the experience weighted average date underlying the data used to develop the experience mortality curves (discussed in subsection C).²

[Drafting Note: further guidance is needed to assist the actuary when selecting the table without margins in situations when little or no data is available.]

3. Credibility Procedure. The statistical credibility of internal mortality data decreases as the number of sub-categories of the internal data increase. For example, aggregation of all experience from a block of business is more credible than one that breaks down experience by gender, duration or underwriting class. Credibility factors must be applied to the aggregated internal data as well as the sub-categorized data.

When applying credibility to determine combined mortality curves by sub-categories, the actuary must reflect the portion of business in each sub-category to the extent known, or an estimate if not known. The actuary may also reflect mortality differentials by sub-category due to underwriting practices and requirements.

The credibility procedure used shall:

- a. be based on a Poisson distribution with a X% probability of being correct within a Y% margin of error. This distribution provides for full credibility if the underlying experience mortality study has a least nnn deaths. The credibility weighting factor for experience mortality data is found by the square root of (N/nnn) where N is the number of deaths in the underlying experience mortality study and nnn is the number representing full credibility.

[Drafting Note: NAIC would need to specify the X and Y above, and may also wish to consider allow other acceptable credibility models.]

- b. produced results that are reasonable in the professional judgment of the actuary,
 - c. be practical to implement,
 - d. give consideration to the need to balance responsiveness and stability, and
 - e. take into account not only the level of aggregate claims but the shape of the mortality curve.
4. Further Adjustment of the Credibility-Adjusted Table for Mortality Improvement. The credibility-adjusted table used for plus segments may be; and the credibility adjusted date used for minus segments must be; adjusted for applicable published industrywide experience from the experience weighted average date underlying the company experience used in the credibility process to the valuation date.

Any adjustment for mortality improvement shall not be allowed beyond the valuation date unless such an adjustment would serve to increase the resulting Stochastic Reserve or Deterministic Reserve.

E) Valuation Margins

An explicit Margin shall be included in the valuation assumption whether experience comes from external studies or internal company studies.

The actuary must select a Margin consistent with those used to develop the most recent Commissioner's Standard tables or using another methodology acceptable to the NAIC.

¹ This approach would require the NAIC to periodically approve the use of recent SOA intercompany studies in order to reflect emerging experience. As such, the NAIC may wish to set up procedures to update on a regular basis.

² This approach would require the NAIC to periodically approve a set of mortality improvement factors. Currently, there are no such approved factors.

F) Determination of an Appropriate Version of the Valuation Table

1. The valuation mortality tables are the most recent Commissioner's Standard tables or versions of these tables adopted by the NAIC for use in determining statutory reserves for individual life insurance.

[Drafting Note: For Principles-Based reserves, the LRWG believes the mortality assumption should closely reflect company experience to the extent credible. Given the large number of risk classes available on current life insurance products and qualification and underwriting requirements that vary significantly by company, we believe it is necessary to have a significant range of approved valuation tables for a company to use for each gender. This range of tables should be broad enough to support company use for all genders and underwriting classes.]

2. Once a Prudent Best Estimate mortality assumption is determined, the actuary must determine the version of the Commissioner's Standard mortality table that is expected to produce a Reported Reserve that is closest to but not less than the Reported Reserve using the Prudent Best Estimate mortality assumption, [with all of the other assumptions being the same.](#)

[Drafting Note: The methodology to determine which version of the ~~Commissioner's~~ Commissioner's Standard mortality table implies the need for parallel testing, as such, this may need additional discussion and testing.]

G) Adjustment to Mortality Curves

Additional adjustment to the valuation mortality table chosen shall be made to reflect the mortality associated with impaired lives or due to extreme policyholder behavior not reflected in the underlying experience. The actuary must reflect any adjustment which increases (reduces) the mortality assumption for a plus (minus) segment. These include adjustments for policy provisions or policyholder behavior that suggest mortality anti-selection. Situations where adjustments are appropriate for plus segments include but are not limited to: term conversions, table shave programs (i.e., Reduced ratings for impaired lives), and high lapse rates.

IV. Guidance and Requirements for Setting Prudent Best Estimate Policyholder Behavior

A. Overview

- 1) Intent. The guidance and requirements in this section apply for setting Prudent Best Estimate Policyholder Behavior assumptions when determining the Stochastic Reserve or the Deterministic Reserve. The intent is for Prudent Best Estimate policyholder behavior assumptions to be based on facts, circumstances and appropriate actuarial practice (where more than one approach to appropriate actuarial practice exists, the actuary should select the practice that the actuary deems most appropriate under the circumstances) with only a limited role for unsupported actuarial judgment.

Policyholder behavior assumptions encompass actions such as, but not limited to lapses, withdrawals, transfers between fixed and separate accounts on variable products, recurring deposits, benefit utilization, and option election. Policyholder behavior is difficult to predict and behavior assumptions can significantly impact the results. In the absence of relevant and fully credible empirical data, the actuary should set behavior assumptions on the conservative end of the plausible spectrum (consistent with the definition of Prudent Best Estimate).

- 2) Granularity Considerations. In setting a behavior assumption the actuary needs to consider the appropriateness of that assumption as it pertains to the policy or block of policies being valued. The actuary will need to make a choice between setting a separate assumption specific and appropriate to each individual policy being valued, a single assumption to be applied to all policies being valued, or some degree of granularity within these two endpoints. In making that choice, the actuary needs to balance the volume of work in establishing a separate assumption specific and appropriate to each individual policy against the possible loss of precision and appropriateness in applying an assumption over a broader group of policies. The application of a single assumption over a group of policies may lead to the unintended premature cessation of projected benefits. The appropriate degree of granularity in the assumptions will be determined by the sensitivity of the results to the level of granularity. The actuary should establish behavior assumptions at a sufficient level of granularity that a higher level of granularity will not materially impact the results. The actuary should be prepared to justify his/her choice of granularity and should retain sufficient documentation supporting that choice.

B. Policyholder Behavior Considerations:

- 1) General Considerations. Policyholder behavior is difficult to predict and behavior assumptions can significantly impact the results. In setting behavior assumptions, the actuary should ~~evaluate~~examine, but not be limited by the considerations listed below.
 - a. Behavior can vary by product, market, distribution channel, fund and policy performance, time/product duration, etc.
 - b. Options embedded in the product may impact behavior.
 - c. Options may be elective or non-elective in nature.
 - d. Elective policyholder options may be more reflective of ~~driven by~~ economic conditions than non-elective options.
 - e. 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 (e.g., lower lapses, higher benefit utilization, etc.).
 - f. Options that are ancillary to the primary product features may not be significant drivers of behavior. Whether an option is ancillary to the primary product features depends on many things such as:
 - i. For what purpose was the product purchased?
 - ii. Is the option elective or non-elective?
 - iii. Is the value of the option well known?
 - g. The impact of behavior can vary by product, time period, etc. Sensitivity testing of assumptions will usually be necessary in establishing the Prudent Best Estimate.
 - h. It may be acceptable to ignore certain items that might otherwise be explicitly modeled in an ideal world, particularly if the inclusion of such items reduces the reserve but the resulting reserve shall be at least as great as it would be if the item were not ignored.
 - i. The underlying model assumptions may differ according to the attributes of the policy being valued. This means that policyholder behavior and persistency may be expected to vary according to such characteristics, but not limited to:
 - i. Gender
 - ii. Attained age
 - iii. Issue age
 - iv. Policy duration
 - v. Time to maturity
 - vi. Tax status
 - vii. Level of account and cash value
 - viii. Surrender charges, transaction fees or other policy charges
 - ix. Distribution channel
 - x. Product features

[Drafting Note: more guidance may need to be given.]

- j. Unless there is clear evidence to the contrary, policyholders' behavior should be consistent with relevant past experience and reasonable future expectations

At any duration for which relevant data do not exist, the actuary should set behavior assumptions reflecting the most efficient policyholder behavior. The actuary should determine what the efficient policyholders' action would be (i.e. lapse the policy, persist, take out a loan, etc.) and determine his or her Prudent Best Estimate rate for that action. The actuary should then project Prudent Best Estimate of the policyholder's actions. To the extent company experience is only partially credible, a blend of the experience and an industry benchmark assumption should be used. For policyholder behavior, assumptions should grade toward optimal plausible behavior for later durations where experience is not yet available.

- k. Ideally, policyholder behavior would be modeled dynamically according to the simulated economic environment and/or other conditions. However, it is reasonable to assume a certain level of non-financially motivated behavior. The actuary need not assume that all policyholders act with 100% efficiency in a financially rational manner. Neither should the actuary assume that policyholders will always act irrationally.

[Drafting note: Further guidance on the degree to which rational, financially efficient behavior should be reflected in the Prudent Best Estimate may be required by an Actuarial Standard of Practice (ASOP)].

- l. The behavior assumptions should be logical and consistent, both individually and in aggregate, especially in the scenarios that govern the results. In other words, the actuary should not set behavior assumptions in isolation, but give due consideration to other elements of the model. The interdependence of assumptions (particularly those governing customer behaviors) makes this task difficult and by definition requires professional judgment, but it is important that the model risk factors and assumptions:
 - i. Remain logically and internally consistent across the scenarios tested;
 - ii. Represent reasonably expected outcomes; and
 - iii. Lead to appropriate, but not excessive, asset requirements.

The actuary should remember that the continuum of “reasonability” should not be confined or constrained to the outcomes and events exhibited by historic experience.

Companies should attempt to track experience for all assumptions that materially affect its risk profile by collecting and maintaining the data required to conduct credible and meaningful studies of policyholder behavior.

- 2) Dynamic Behavior. 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 behavior. ~~With due regard to considerations of materiality and practicality, the use of dynamic models is encouraged, but not mandatory.~~ Dynamic assumptions are required where there would be a material impact from using dynamic assumptions versus static assumptions.

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. In the absence of evidence to the contrary, it may not be necessary to model extreme or “catastrophic” forms of behavior. However, the actuary is encouraged to test the sensitivity of results to understand the materiality of making alternate assumptions and recommend ongoing monitoring of material risk factors.

- 3) Consistency of Prudent Best Estimate and the CTE Measure. All behaviors (i.e., dynamic, formulaic and static) should be consistent with the scenarios used in the CTE calculations. To maintain such consistency, it is not necessary to iterate (i.e., successive runs of the model) in order to determine exactly which scenario results are included in the CTE measure. Rather, in light of the products being valued, the actuary should be mindful of the general characteristics of those scenarios likely to represent the tail of the loss distribution and consequently use Prudent Best Estimate assumptions for behavior that are reasonable and appropriate in such scenarios. The actuary should examine the results that occur when the base assumption, Margins and dynamic formula are brought together for the different policyholder behavior assumptions. It is expected that the assumptions used would cause the results to fall within a loss distribution consistent with CTE risk level.
- 4) Prescribed Requirements. Prudent Best Estimate premium assumptions are determined by following the requirements in subsection C. Prudent Best Estimate withdrawal assumptions are determined by following the requirements in subsection D.

C) Premium Assumption

- 1) General Considerations. An important assumption in the valuation is the future premium deposit assumption. Depending upon the product structure, future premiums may be fixed, may be flexible at the discretion of the policyholder, or may be adjustable subject to discretion of the company.

For policies with fixed future premiums, no assumption is necessary as to variations in the future premium deposit stream. In other situations, a premium persistency assumption is needed, subject to the limitations specified in the policy design.

A key consideration of the future premiums for a given policy is whether the policy was sold to primarily affect permanent coverage, or to primarily effect the accumulation of savings. For policies sold as permanent coverage it would be expected that the policyholder would tend to pay the minimum premium at the latest possible date to keep the policy in force to maturity. For policies sold as a savings vehicle it would be expected that the policyholder would tend to pay more than the minimum amount.

When premiums are not fixed, the future premiums that are assumed may produce significant differences in liabilities for different assumptions. The assumption chosen should be consistent with the information available from the policy administration system. The actual premium received could be compared to the amount of premium that would have been generated by the future premium assumption applied to the prior period in-force policies. This analysis may be valuable in determining the appropriateness of the future premium assumption.

- 2) Premium Persistency. In determining the future premium persistency for a particular policy, the actuary should consider that low premium persistency rates could be expected if the following are present:
 - a. Marketing material places emphasis on premium flexibility;
 - b. Sales illustrations feature quick-pay premiums (which could lead to low premium persistency rates in later years);
 - c. Presence of large lump sum premiums in the past; or
 - d. Credited rates in the near future are expected to be less than market rates.

High premium persistency rates could be expected if the following are present:

- a. Most business is through pre-authorized transfers
- b. Marketing material places emphasis on credited interest rates, tax advantages and savings aspects of the plan;
- c. Interest rate crediting is based on portfolio rates and new money rates decrease;
- d. the existence of persistency bonuses; or
- e. the existence of other policyholder incentives to not reduce premium levels.

For policies with regular periodic premiums required for the policy to remain in force, premium persistency should be consistent with expected future lapse rates and include policies moving to non-forfeiture options where applicable.

- 3) Historical Data. All future projections of premiums should be based on historical premium payments, where available. However, the actuary should exercise caution in assuming that current behavior will be indefinitely maintained. For example, it might be appropriate to assume that future behavior will differ from historical experience to the extent that market, environmental or other changes make historical experience less relevant.
- 4) Data Lacking. When historical experience is lacking, the future premium assumption may be derived in a reasonable and appropriate manner from actual experience and past trends in experience of other similar classes of business either in the same company, of other companies, or from other sources, generally in that order of preference.

For universal life policies and other flexible premium policies, illustrated premiums or target premiums can be used but the actuary should exercise caution in assuming the target premium will be paid for all years in the future. For flexible premium policies with long-term guarantees with secondary guarantees, the level of future expected premiums can have a large effect on reserves. The actuary should consider assuming the minimum premium to keep the policy in force is paid (either the stipulated premium or the minimum amount required to provide for a positive shadow account). Excess funding of universal life policies with secondary guarantees will tend to decrease the liability amount and should only be used where such specific policyholder behavior has previously been observed.

- 5) Sensitivity Testing. The actuary is required to examine the sensitivity of results to understand the materiality of making alternate assumptions. For example, the actuary must examine, but not be limited by the following, premium assumptions:

- a. **Minimum premium scenario.** At any point in the policy’s lifetime, the policy provisions define a future stream of minimum premium payments that will keep the policy in force until policy expiry. The pattern of premium payments may depend on the policy design, and could be level or annually increasing or a combination of the two. The sensitivity test should be performed to determine the impact on reserves assuming that the policyholder pays the minimum premium required by the policy terms to keep the policy in force each year.
- b. **Non-payment of premiums.** When the minimum premium is greater than zero, it is reasonable to assume that some policyholders fail to pay the minimum premium, especially when the minimum premium for the current year is greater than the premium actually paid in the prior year. If the minimum premium is increasing substantially compared to the prior year premium, it is reasonable to assume a “shock lapse”, for example, where the minimum premium has been zero for a period of years and the next minimum premium is substantial. These non-payment lapse assumptions should be consistent with lapse experience on policies where no nonforfeiture option is available.
- c. **Pre-payment of premiums – Single premium case.** Policyholders may elect to pay all of their premiums ahead of schedule. In this case the minimum premium will be zero and no non-payment lapses would be assumed. However, if the value of the cash surrender value is roughly equivalent to the value of the future death benefits (assuming no further premiums), then it would be reasonable to assume some policyholders will elect to surrender their policies. If the cash surrender value is substantially less than the value of the death benefits, as is often the case with policies with shadow accounts, it would be reasonable to assume that few or none would surrender their policies.
- d. **Pre-payment of premiums – Level premium case.** Policyholders may elect to pay a level premium which is guaranteed to keep the policy in force until the policyholder’s death. Typically, in this case, the minimum premium will be zero followed by annually increasing premiums. However, it is reasonable to assume that some policyholders will continue the premium pattern that they have already established. It will be important to consider both of these premium payment scenarios since the value of the pre-payment option will depend on future interest rates compared to the interest rates guaranteed in any shadow account. Whenever the minimum premium is zero, surrender assumptions would be similar to those described for the single premium case.

Where the results are highly sensitive to the assumed premium pattern, the actuary must consider the results of the sensitivity test in determining the Prudent Best Estimate.

[Drafting note: More guidance is needed regarding how the reserves should be increased to reflect results being highly sensitive to the premium pattern.]

D) Withdrawal Assumption

- 1) General Considerations. Withdrawal assumptions would typically be deterministic in nature rather than stochastic. However, the withdrawal assumption would typically have a dynamic component in response to the current interest rate environment, funding level, premium increases, and benefit triggers.

The actuary should exercise care in using static assumptions when it would be more natural and reasonable to use a dynamic model for behavior. ~~Within materiality considerations, the use of dynamic models is encouraged, but not mandatory.~~ Dynamic assumptions are required where there would be materially higher reserves resulting from using dynamic assumptions versus static assumptions. Risk factors which are not scenario tested, but could reasonably be expected to vary according to (a) a stochastic process, or (b) future states of the world (especially in response to economic drivers) may require additional Margins and/or signal a need for higher Margins for certain other assumptions.

In setting a withdrawal assumption, the actuary should consider items such as but not limited to:

- a. policy plan and options;
- b. the policy’s competitiveness, surrender charges, interest bonuses, persistency bonuses, taxation upon withdrawal and other incentives and disincentives to withdrawal;
- c. the life insured’s attained age, gender and duration since issue of the policy;
- d. premium paying pattern;
- e. method of payment and frequency of premiums;

- f. policy fund value;
- g. policy tax status;
- h. investment options (both internal to policy and external);
- i. guaranteed benefit amounts;
- j. policyholder and sales representative sophistication;
- k. the insurer's distribution system and its commission conversion replacement and other marketing practices;
- l. the interest rate scenario;
- m. external influences on withdrawals, e.g. emergence of viatical/life settlement companies;
- n. future increased sophistication of policyholders and sales representatives and
- o. the effect of any anti-selection.

[Drafting Note: further guidance as to the establishment of Best Estimate may be ~~needed useful either directly in this document or alternatively through reference to an ASOP to be developed~~]

- 2) Cliff. A “cliff” is a sudden significant increase in the benefit available at withdrawal. That increase may result from an increase in the cash value, a decrease in the surrender charge, or the availability of a maturity benefit or persistency bonus. Unless there is pertinent persistency experience data to the contrary, the actuary's Best Estimate withdrawal rates would grade to zero as the cliff approaches and remain at zero for an interval before the cliff is reached.
- 3) Paid-Up Policies. The actuary's Best Estimate withdrawal rate would be zero for a paid-up policy with little nonforfeiture benefit relative to the premiums paid.
- 4) Consistency with Other Assumptions. It is important that the withdrawal assumptions are consistent with the other projection assumptions such as premiums, policyholder behavior and mortality deterioration.
- 5) Sources and use of withdrawal data for setting valuation withdrawal assumptions.
 - a. Internal studies should be used as input to the valuation withdrawal assumptions if such studies are statistically credible, whether the results of the internal study are more or less favorable than external studies.
 - b. If no relevant and statistically credible internal studies exist, external withdrawal studies should be considered to set valuation withdrawal assumptions.
 - c. If a company's product design or other criteria are inconsistent with the product being valued in the external withdrawal study, then the external withdrawal study should be adjusted for the purpose of establishing valuation withdrawal assumptions.
 - d. Internal studies may be combined with external information based on the relevance of experience and its degree of credibility. Adjustments shall be applied to reflect differences in the business underlying the underlying internal and external studies.
- 6) Sensitivity Testing. Where no such historical experience is available or relevant it is important that the actuary perform sensitivity testing on this assumption in order to understand and appropriately reflect the risk.
- 7) Margins. A Margin should be included in valuation withdrawal assumptions, whether the withdrawal experience comes from external studies or internal company studies. A lower Margin would be appropriate where withdrawal assumptions are supported by credible historical company experience. A higher Margin is appropriate where:
 - a. the company's withdrawal experience is not credible;
 - b. there is no market value adjustment at withdrawal;
 - c. the economic outlook is unstable;

- d. the insurer's marketing practice provokes anti-selection; or
- e. the assumption relates to an event further in the future

The Margins are added to or subtracted from the Best Estimate withdrawal rates, as appropriate. In order to ensure that the Margin increases Reported Reserves, the choice between addition and subtraction may need to vary by scenario, age, policy duration, and other parameters. In the case of partial withdrawal, two assumptions are needed – the amount withdrawn and the partial withdrawal rate.

The Margin ~~may be~~ applied to the withdrawal assumption must be identifiable and applied in either the dynamic behavior adjustment or the base assumption as appropriate.

V. Guidance and Requirements for Setting Expense Assumptions

A. Overview:

The guidance and requirements in this section apply for setting Prudent Best Estimate expense assumptions used to determine the Deterministic Reserve or Stochastic Reserve.

B. Expense Assumption Considerations:

Below is a list of considerations for the actuary when determining Prudent Best Estimate expense assumptions.

1. The expense assumption should reflect all costs associated with the policies being modeled. In other words, the expense assumption should reflect the direct costs associated with the policies being modeled as well as an appropriate portion of indirect costs and overhead (i.e. expense assumptions representing fully allocated expenses should be used.)
2. Expenses categorized in the annual statement as 'taxes, licenses and fees' (Exhibit 3 of the Annual Statement) should be included in the expense assumption.
3. Acquisition expenses and significant non-recurring expenses expected to be incurred after the valuation date should be included in the expense assumption.
4. Certain Information Technology development costs and other capital expenditures may be spread over a reasonable number of years in accordance with accepted statutory accounting principles as defined in the Statements of Statutory Accounting Principles (care should be taken with regards to the potential interaction ~~of with~~ considerations ~~2 and 3~~ above).
5. Expense assumptions should assume that the company is a going-concern.
6. An appropriate expense basis should be chosen that properly aligns the actual expense to the assumption. For example, death benefit expenses should be modeled with an expense assumption that is per death incurred. If values are not significant they may be aggregated into a different base assumption.
7. In general, expenses should reflect the impact of inflation. The inflation assumption should be determined in a manner consistent with asset assumptions used in the model.
8. Expense assumptions should not assume future expense improvements.
9. The model used to determine reserve levels should be measured before Federal Income Taxes. Therefore assumptions needed to determine federal or foreign income tax are not required.
10. Margin should be added. The greater the uncertainty of the expense assumption, the greater the Margin.
11. Expense assumptions should be consistent with other related assumptions. For example, the manner that investment expenses are handled should be consistent with the manner that asset returns are reflected in the model.

C. Methodology

1. General Considerations: Expenses should be set by use of Prudent Best Estimate assumptions. These assumptions are based on a company's own experience and derived from careful study that is within ~~with~~ the range of actuarial practice. Fully allocated expenses should be used, e.g. the expense assumptions should reflect the direct costs associated with the block of policies being modeled as well as indirect costs and overhead costs that have been appropriately allocated to the modeled policies.

Future expense assumptions should also reflect the impact of inflation as part of the Prudent Best Estimate. The inflation rate should be set in a manner consistent with the asset assumptions used in the model. Expense assumptions for the deterministic and stochastic Scenarios are expected to be the same. Differences could occur with the application of the inflation factor.

[Drafting note: Further guidance may be required via an ASOP or Practice Note]

2. **Margin:** Consistent with the definition of Prudent Best Estimate, Margins should be reflected. A lower Margin may be appropriate where expense assumptions are supported by credible historical company experience or for a line of business that is growing quickly (thereby spreading the fixed costs). A higher Margin ~~may be appropriate~~ is required where:
 - a. allocation methods create uncertainty regarding line of business splits - especially as it concerns overhead expenses;
 - b. the company's expense experience is not credible;
 - c. the economic outlook is unstable;
 - d. the insurer's expenses have not been quantified by a study which follows accepted actuarial practice and principles;
 - e. sensitivity testing determines that the reserve is sensitive to the expense assumption; or
 - f. the regulatory environment is one that creates the likelihood of increased expenses.

The Margin applied to the expense assumption must be identifiable and may be applied in either the dynamic behavior adjustment or the base assumption as appropriate.

3. **Expense Allocations:** Expense allocations shall be done in a manner that is within the range of actuarial practice and methodology and that is consistent with ASOP. The allocation method used shall be consistent across company lines of business. Allocations may not be done for the purpose of lowering Reported Reserves. Overhead expenses that are allocated to the acquisition function shall be able to be supported by sound actuarial principles and where possible, by company experience.
4. **Significant Expenses due to Non-recurring Events:** Most significant, non-IT related expenditures are expected to occur prior to the valuation date and would therefore not be included in the reserve calculation. However, there may be some types of non-recurring expenses that are expected to occur beyond the valuation date. An example of this kind of cost would be severance costs anticipated in the next year or legal costs associated with class action suits. These expenses should be reflected in the assumption for the future period that they are anticipated to occur. Significant expenses due to IT related investment should follow statutory accounting principles in determining whether or not they should be capitalized. Capitalized expenses should not receive unique treatment according to this methodology. The depreciation of those expenses is reflected in Exhibit 2 of the statement and captured in the validation tool which is used to verify the reasonableness of the expense assumption

If there is a unique situation that has occurred whereby excessive expenses can not be reasonably allocated among lines of business, regulatory approval may be sought for a reasonable application of the considerations outlined in subsection B above.

5. **Mergers & Acquisitions:** Only expense efficiencies that are derived and realized from the combination of blocks of business due to a business acquisition or merger should be reflected in the expense assumption as long as any costs associated with achieving the efficiencies are also recognized. For example, the combining of two similar blocks of business on the same administrative system may yield some expense savings on a per unit basis, but any future cost of the system conversion should also be considered in the final assumption. If all costs for the conversion are in the past then there would be no future expenses to reflect in the valuation.

VI. Guidance and Requirements for Setting Asset Assumptions

- A. **General Considerations.** The guidance and requirements in this section apply for setting Prudent Best Estimate assumptions related to the projection of asset cash flows and net investment earnings for starting assets and reinvestment assets when determining the Stochastic Reserve or the Deterministic Reserve. Modeling of both general account and separate account assets are addressed, as well as modeling of hedge instruments. The paths of future U.S. Treasury rates and the calibration standards for equity and separate account fund returns will be defined by the Model Regulation and applicable guidelines.

B. Income, Defaults, Reinvestment Spreads and Other Assumptions

For both the Stochastic Reserve and Deterministic Reserve calculations:

- 1) Default cost assumptions for the various fixed income asset classes should reflect Prudent Best Estimates of long-term losses consistent with the type of asset and quality rating. The Prudent Best Estimate default cost for a particular asset class should take into consideration the company's own experience, to the extent credible, and available insurance industry and broad financial market experience. An explicit Margin shall be added to the expected default costs. The default cost assumptions for the various asset classes should be consistent for starting assets and reinvestment assets.
- 2) Spreads over Treasuries reflected in the purchase yields of reinvestment assets are to be Prudent Best Estimates. The types, quality and maturities of such reinvestment assets should be consistent with the company's current investment strategy for the block of business being valued.
- 3) Any uncertainty in the timing of asset cash flows related to movements in interest rates (“e.g., prepayment risk”) should be reflected directly in the projection of asset cash flows under the various scenarios within the Stochastic Reserve calculation model and be reflected in a margin in the Deterministic Reserve calculation. For example, prepayment, extension, call and put features should be specifically modeled in a manner consistent with current asset adequacy analysis practice.

[Drafting Note: Guidance on equity-type assets, such as common stock, equity real estate, and Schedule BA assets must be determined]

C. Modeling of Hedges

1) General Considerations

The appropriate costs and benefits of hedging instruments that are currently held by the company in support of the policies falling under the Model Regulation (excluding those that involve the offsetting of the risks associated with products outside of the scope of the Approach) shall be included in the calculation of the Deterministic Reserve and Stochastic Reserve.

If the company is following a Clearly Defined Hedging Strategy (“hedging strategy”), as defined in section 7.E.7.5 of the Model Regulation, in accordance with an investment policy adopted by the Board of Directors or a committee of Board members, the company is eligible to reduce the amount of the Reported Stochastic Reserve using projections otherwise calculated. The investment policy must clearly articulate the company's hedging objectives, including the metrics that drive rebalancing/trading. This specification could include maximum tolerable values for investment losses, earnings, volatility, exposure, etc. in either absolute or relative terms over one or more investment horizons vis-à-vis the chance of occurrence. Company management is responsible for developing, documenting, executing and evaluating the investment strategy, including the hedging strategy, used to implement the investment policy.

For this purpose, the investment assets refer to all the assets including derivatives supporting covered products and guarantees. This is also referred to as the investment portfolio. The investment strategy is the set of all asset holdings at all points in ~~all~~ time in all scenarios. The hedging portfolio, which is also referred to as the hedging assets, is a subset of the investment assets. The hedging strategy is the hedging asset holdings at all points in time in all scenarios. The distinction of what is the hedging portfolio and what is the investment portfolio is ~~something that is not attempted to be made~~ in this section. Nor is the distinction between investment strategy and hedging strategy formally made here. Where necessary to give effect to the intent of this section, the requirements applicable to the hedging portfolio or the hedging strategy are to apply to the overall investment portfolio and investment strategy.

This particularly applies to restrictions on the reasonableness or acceptability of the models that make up the ~~stochastic~~ cash flow model used to perform the projections, since these restrictions are inherently restrictions on the joint modeling of the hedging and non-hedging portfolio. To give effect to these requirements, they must apply to the overall investment strategy and investment portfolio.

The cost and benefits of hedging instruments that are currently held by the company in support of the policies falling under the Model Regulation shall be included in the ~~stochastic~~ cash flow model used to calculate the Deterministic Reserve and the Stochastic Reserve. If the company is following a Clearly Defined Hedging Strategy, the model shall take into account the cost and benefits of hedge positions expected to be held by the company in the future based on the operation of the hedging strategy.

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

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

2) Background

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

The fundamental characteristic of the first method is that all hedging positions, both the currently held positions and those expected to be held in the future, are included in the stochastic-cash flow model used to determine the Reported Scenario Reserve.

The fundamental characteristic of the second method is that the effectiveness of the current hedging strategy (including currently held hedge positions) on future cash flows is evaluated, in part or in whole, outside of the stochastic-cash flow model. In this case, the reduction to the Reported Stochastic Reserve otherwise calculated should be commensurate with the degree of effectiveness of the hedging strategy in reducing accumulated deficiencies otherwise calculated.

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

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

3) Calculation of CTE Amount (reported)

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

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

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

$$\text{CTE Amount (reported)} = \text{CTE Amount (best efforts)} + E \times \text{MAX}[0, \text{CTE Amount (adjusted)} - \text{CTE Amount (best efforts)}]$$

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

4) Specific Considerations and Requirements

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

A discontinuous hedging strategy is a hedging strategy where the relationships between the sensitivities to equity markets and interest rates (commonly referred to as the Greeks) associated with ~~some~~ guaranteed policyholder options embedded in ~~some products~~ the variable annuities and other in-scope products and these same sensitivities associated with the hedging assets are subject to material discontinuities. ~~This includes, but is not limited to, a hedging strategy where material hedging assets will be obtained when the variable annuity account balances reach a predetermined level in relationship to the guarantees.~~ Any hedging strategy, including a delta hedging strategy, can be a discontinuous hedging strategy if implementation of the strategy permits material discontinuities between the sensitivities to equity markets and interest rates associated with the guaranteed policyholder options embedded in the variable annuities and other in-scope products and these same sensitivities associated with the hedging assets. There may be scenarios that are particularly costly to discontinuous hedging strategies, especially where those result in large discontinuous changes in sensitivities (Greeks) associated with the hedging assets. Where discontinuous hedging strategies contribute materially to a reduction in the StochasticReported Reserve, the actuary must evaluate the interaction of future trigger definitions and the discontinuous hedging strategy, in addition to the items mentioned in the previous paragraph. This includes an analysis of model assumptions that, when combined with the reliance on the discontinuous hedging strategy, may result in adverse results relative to those modeled.

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

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

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

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

In addition to the above, the method used to determine prices of financial instruments for trading in scenarios should be compared to actual initial market prices. If there are substantial discrepancies, the actuary should disclose the material discrepancies and provide supporting documentation as to why the model-based prices are

appropriate for determining the ~~Reported Stochastic~~ Reserve. In addition to comparisons to initial market prices, there should be testing of the pricing models that are used to determine subsequent prices when scenarios involve trading financial instruments. This testing should consider historical relationships. For example, if a method is used where recent volatility in the scenario is one of the determinants of prices for trading in that scenario, then that model should approximate actual historic prices in similar circumstances in history.

~~*[Drafting Note: The hedging section needs to be re-worded to reflect life insurance-type risks.]*~~

VII. Guidance and Requirements for Reflecting Non-Guaranteed Elements

A. Overview:

Non-Guaranteed Elements are to be included in the projection of future cash flows for both the Deterministic Reserve and the Stochastic Reserve. Where Non-Guaranteed Elements are based on some aspect of experience, future changes in the level of Non-Guaranteed Elements can be determined by a model based on the experience assumed in each scenario. This guidance covers procedures used to model the timing and amount of future changes in the level of Non-Guaranteed Elements.

B. Relationship between Non-Guaranteed Elements, NGE Re-determination Margins, valuation assumptions, and valuation margins:

Where Non-Guaranteed Elements are based on experience, there is normally some difference or spread that is used to set the Non-Guaranteed Element based on the actual experience. This difference or spread will be referred to as the NGE Re-determination Margin. It is the amount added to the actual experience to arrive at the Non-Guaranteed Element. For example, if a company credits interest to policyholders at a rate 1.20% lower than its net investment yield, then the NGE Re-determination Margin on the investment yield is negative 1.20%. NGE Re-determination Margins can be positive or negative. An example of a typical positive NGE Re-determination Margin is the spread between experience mortality rates and the cost of insurance (COI) charges in a Universal Life policy.

Valuation assumptions are those used in the cash flow projections, and include a Margin. This Margin will be referred to as the valuation margin. Conceptually, it is the amount added to Best Estimate assumptions. For example, if a Best Estimate mortality rate is 0.003 and the valuation assumption is 0.0032, the valuation margin is +0.0002. Like NGE Re-determination Margins, valuation margins can be positive or negative.

Non-Guaranteed Elements are normally set equal to Best Estimate assumptions plus a NGE Re-determination Margin. Since Best Estimate assumptions are conceptually equal to valuation assumptions minus the valuation margin, we have the following:

$$(\text{Non-Guaranteed Elements}) = (\text{valuation assumption}) + [\text{NGE Re-determination Margin} - (\text{valuation margin})]$$

This relationship can be used to set projected Non-Guaranteed Elements in the model for valuation purposes.

Given these definitions and relationships, the following observations can be made:

1. Valuation margins reflect the risk that full NGE Re-determination Margins will not be earned.
2. NGE Re-determination Margins are set independently of the valuation process, and projected NGE Re-determination Margins should be chosen to be consistent with those underlying the current Non-Guaranteed Elements.
3. Valuation margins are not always explicitly known and therefore must be estimated by the actuary.

On any valuation date, a current level of Non-Guaranteed Elements is payable. The actuary should assume that any changes to this level will be consistent with the terms of the underlying policy and the company's normal practice. As would be the case in actual practice, the projected Non-Guaranteed Elements should not be assumed to change simultaneously with the change in projected experience, but only at the next date following recognition of a change in experience on which the company would normally implement a change.

VIII. Guidance and Requirements for Reflecting Revenue Sharing

A. Requirements

Projections may include income from projected future Revenue Sharing (as defined in the Model Regulation and applicable Guidelines and ASOPs) net of applicable projected expenses ("Net Revenue Sharing Income") if the following requirements are met:

1. the Net Revenue Sharing Income is received and controlled by the company³;
2. signed contractual agreement or agreements are in place as of the valuation date and support the current payment of the Net Revenue Sharing Income; and
3. the Net Revenue Sharing Income is not already accounted for directly or indirectly as a company asset.

B. Revenue Sharing Amounts

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

1. The terms and limitations of the agreement(s), including anticipated revenue, associated expenses and any contingent payments incurred or made by either the company or the entity providing the net Revenue Sharing as part of the agreement(s);
2. the relationship between the company and the entity providing the Net Revenue Sharing Income that might affect the likelihood of payment and the level of expenses;
3. the benefits and risks to both the company and the entity paying the Net Revenue Sharing Income of continuing the arrangement;
4. the likelihood that the company will collect the Net Revenue Sharing Income during the term(s) of the agreement(s) and the likelihood of continuing to receive future revenue after the agreement(s) has ended;
5. the ability of the company to replace the services provided to it by the entity providing the Net Revenue Sharing Income or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide; and
6. the ability of the entity providing the Net Revenue Sharing Income to replace the services provided to it by the company or to provide the services itself, along with the likelihood that the replaced or provided services will cost more to provide.
7. All expenses required or assumed to be incurred by the company in conjunction with the arrangement providing the Net Revenue Sharing Income, as well as any expenses assumed to be incurred by the company in conjunction with the assumed replacement of the services provided to it (as discussed in subsection B.5 above) shall be included in the projections as a company expense. In addition, expenses incurred by either the entity providing the Net Revenue Sharing Income or an affiliate of the company shall be included in the applicable expenses that reduce the Net Revenue Sharing Income.

C. Margins

The amount of projected Net Revenue Sharing Income shall also reflect a Margin (which decreases the assumed Net Revenue Sharing Income) directly related to the uncertainty of the revenue, including uncertainty regarding the creditworthiness of the provider of the Net Revenue Sharing Income. The greater the uncertainty, the larger the Margin.⁴

³ As in other sections of this report, the term "the company" is used exclusively as a reference to the insurance company writing the business falling under the scope of the Model Regulation. The term "entity providing the Net Revenue Sharing Income" is self-explanatory and is used consistently in this subsection.

⁴ Because the uncertainty would be expected to increase over time, it may be necessary to decrease the revenue by larger amounts in later projection periods.

To the extent the agreements(s) guarantees⁵ the payment of Net Revenue Sharing Income to the company, the net revenue may be included in full over the period for which it is guaranteed.⁶

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

⁵ Provisions such as one that gives the entity paying the Net Revenue Sharing Income the option to stop or change the level of income paid would prevent the income from being guaranteed. However, if such an option becomes available only at a future point in time, and the revenue up to that time is guaranteed, the income is considered guaranteed up to the time the option first becomes available.

⁶ If the agreement allows the company to unilaterally take control of the underlying fund fees that ultimately result in the Net Revenue Sharing Income then the revenue is considered guaranteed up until the time at which the company can take such control. Since it is unknown whether the company can perform the services associated with the revenue sharing arrangement at the same expense level, it is presumed that expenses will be higher in this situation. Therefore, the Net Revenue Sharing Income shall be reduced to account for any actual or assumed additional expenses.