EMERGING ACTUARIAL ISSUES (E) WORKING GROUP
Thursday, March 26, 2015
4:00 – 5:00 p.m.
Sheraton Phoenix Downtown—Phoenix Ballroom D/E—3rd Level

ROLL CALL

Mike Boerner, Chair               Texas
Mark Birdsall                    Kansas
William Carmello                 New York
Tom Kilcoyne                     Pennsylvania
Em Johnson                       Virginia

AGENDA

1. Consider Adoption of Working Group Minutes—Mike Boerner (TX)  Page 3
2. Consider Exposing Draft Responses to Pending Questions—Mike Boerner (TX)  Page 5
   a. Summers/Lombardi AG 38 Section 8E Prefunding Ratio
3. Discuss Any Other Matters Brought Before the Working Group—Mike Boerner (TX)  Page 13
   a. Considerations of VM-20 Pretax IMR proposal on AG 38
4. Adjournment
The Emerging Actuarial Issues (E) Working Group of the Financial Condition (E) Committee met via conference call Dec. 11, 2014. The following Working Group members participated: Mike Boerner, Chair (TX); William Carmello (NY); Tom Kilcoyne (PA); and Ern Johnson (VA).

1. **Adopted the Response to the Hypothetical Asset Portfolio Question**

Mr. Boerner reviewed the revised draft Working Group response to the hypothetical asset portfolio question (Attachment A). John Bruins (American Council of Life Insurers—ACLI) said the ACLI supports adoption the response.

Mr. Kilcoyne made a motion, seconded by Mr. Johnson, to adopt the Working Group response to the hypothetical asset portfolio question. The motion passed unanimously.

Having no further business, the Emerging Actuarial Issues (E) Working Group adjourned.
The Emerging Actuarial Issues (E) Working Group of the Financial Condition (E) Committee met via conference call Dec. 4, 2014. The following Working Group members participated: Mike Boerner, Chair (TX); William Carmello (NY); Tom Kilcoyne (PA); and Ern Johnson (VA).

1. **Adopted its Fall National Meeting Minutes**

   Mr. Johnson made a motion, seconded by Mr. Kilcoyne, to adopt the Working Group’s Fall National Meeting minutes (See NAIC Proceedings – Fall 2014, Emerging Actuarial Issues (E) Working Group Nov. 14, minutes). The motion passed unanimously.

2. **Voted to Re-expose the Response to the Hypothetical Asset Portfolio Question**

   John Bruins (American Council of Life Insurers—ACLI) said the exposed response (Attachment 1) was comprised of two parts, neither of which incorporated all the necessary pieces to fully address the question. He said that the first part of the response addressed the hypothetical portfolio and A-rated bond portfolio constraint but did not address the issue of reliance on the reinsurance partner. He said the second part of the response addressed the hypothetical portfolio and the reinsurance issue but did not address the A-rated bond portfolio constraint. Mr. Bruins said that the ACLI comment letter (Attachment 2) provided a suggested response that brings together all of the issues. He said that the Working Group’s revised response (Attachment 3) streamlines the response while encompassing all the issues addressed in the ACLI comment letter.

   Mr. Boerner recommended changing the language in the third paragraph of the second part of the question by striking the words “if an” and replacing them with the words “to use in place of the” and adding the words “if that actual portfolio” prior to the words “is incomplete or unavailable.”

   Mr. Carmello made a motion, seconded by Mr. Johnson, to re-expose the Working Group’s response, with the changes recommended by Mr. Boerner, through Dec. 10. The motion passed unanimously.

3. **Discussed the Draft Response to the AG 38 Section 8E Ratio Question**

   Mr. Bruins discussed the ACLI’s proposed edits (Attachment 4) to the AG 38 section 8E ratio question raised by Sheldon Summers (Claire Thinking Inc.). Mr. Bruins said limiting the denominator of the ratio to the net single premium provides a standard that is practical and objective. Due to the impact on pricing, the ACLI proposal recommends a prospective implementation date that will allow companies an opportunity to bring their products into compliance. Mr. Boerner discussed a revised version (Attachment 5) of the response to the AG 38 section 8E ratio question. He said the major revision incorporates modifications to the language describing treatments of multiple sets of charges and credits, and incorporates the limit on the denominator. Mr. Kilcoyne said he is not in favor of an approach that requires the blending of charges and credits. Mr. Boerner said the revision does not require blending but does allow an aggregate approach in lieu of policy-by-policy calculations. Mr. Summers said that when discussing multiple sets of charges and credits, a differentiation should be made between: 1) charges and credits that may change as they are applied to the shadow account; and 2) charges and credits that are set for the current amount of the shadow account and change only if applied marginally to amounts exceeding the shadow account due to overpayment. Mr. Boerner continued the call as a brainstorming session for ways to effectively address the AG 38 section 8E ratio question.

   Having no further business, the Emerging Actuarial Issues (E) Working Group adjourned.
Emerging Actuarial Issues (E) Working Group

Submission Form

Issue / Question: This question is being submitted at the request of our regulator. The company’s SGUL policies generally have a single band for policy loads and cost of insurance charges, but a multi-tiered structure for interest rates in the shadow fund calculation. This product design allows for flexibility in the premium funding for policies, while improving the overall risk management, by encouraging certain premium patterns, and discouraging excessive dump-in money. The question is whether the multi-tiered credited rate structure should be reflected in the calculation of the single Shadow Fund amount in Step 4a of Section B. This amount is the denominator of the Step 4 ratio. As a reminder, the numerator is the actual Shadow Fund value on the valuation date, and its credited rates are based on the multi-tiered structure.

Relevant Cite(s): Actuarial Guideline 38 Section B

Any Additional Considerations: N/A

Any Recommendation(s): Continue to use the actual multi-tiered credited rate structure of the Shadow Fund to determine the amount in Step 4a, which is the denominator of the Step 4 ratio.

Basis for Recommendation(s): The use of the actual multi-tiered credited rate structure of the Shadow Fund in the Step 4 ratio calculation is necessary, so that the numerator and denominator are consistent with one another. If the interest rates for the higher tiers are not utilized in the determination of the denominator, then the amount calculated does not fully fund the guarantee.

Submitting Party:
PHLV Variable Insurance Company
Robert J. Lombardi, Senior Vice President and Chief Actuary
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October 2, 2013

Response from the Emerging Actuarial Issues (E) Working Group:

AG 38, 8E, 8C, and 8B all provide the intent of the ratio in Step 4 is to measure the level of prefunding. Given the varying interpretations which the bifurcated solution and AG 38, Section 8D, strived to address, this response is qualified for issues within the scope of AG 38, Section 8E, only. In general, the intent of the 8E ratio in Step 4 (i.e. to measure the level of prefunding) is only achieved if the charges and credits used in calculating the minimum amount required to fully fund the guarantee are reasonably consistent with the charges and credits expected to apply over the future course of the policy. If this submission is addressed with respect to Section 8E, the use of credits from the multi-tiered interest structure in calculating this minimum amount should be those that are reasonably consistent with credits expected to apply over the future course of the policy. The language provided in Section 8E, Step 4 regarding consistency of assumptions within the numerator and denominator serves as a guide to carry out this intent, but the intent prevails over dubious consistency.

November 22, 2013
Emerging Actuarial Issues Working Group

Previously Exposed Draft Response to

AG 38 Section Prefunding Ratio Question

Submitted by Sheldon Summers
Emerging Actuarial Issues (E) Working Group

Submission Form

Issue / Question:
A universal life policy contains a secondary guarantee based on the value of a shadow account. As long as the shadow account is positive, the policy is guaranteed not to lapse, even if the cash surrender value is not positive. The shadow account value accumulates with interest from one period to another, with deductions for COI charges. The interest credited to the shadow account is calculated as follows:

- 10% interest is credited to the shadow account up to a threshold amount.
- 0% interest is credited to the any excess of the shadow account over the threshold amount.
- The threshold amount is equal to the accumulation of the level premium that would keep the shadow account positive throughout the secondary guarantee period, assuming 10% interest is credited.

The shadow account is not larger than the threshold amount on the valuation date. For purposes of the fourth step in sections 8B and 8C of the Guideline, what interest rate should be used to determine the shadow account value that would fully fund the secondary guarantee?

Relevant Cite(s):
Actuarial Guideline 38 Introduction and sections 8B and 8C. More specifically, the second paragraph of the Introduction section and the fourth step paragraph in sections 8B and 8C.

Any Additional Considerations:
The Life and Health Actuarial Task Force attempted to address the alteration of the reserves through policy designs that increased the denominator of the pre-funding ratio without impacting the portion of the benefit already funded by the excess premiums paid up through the valuation date. The first amendment to AG 38, which added section 8B, not only changed the denominator of the pre-funding ratio to be a shadow account value (for the policy design being discussed) rather than a single premium payment amount, but also added consistency language to the fourth step of the calculation. The LHATF recognized that the specific revisions made to the Guideline may not address similar concerns for all policy designs, and therefore added intent language at the beginning of the Guideline to make it clear that reserves for policy designs providing similar benefits for the same required premiums should have comparable reserves.

Any Recommendation(s):
10% interest should be used.

**Basis for Recommendation(s):**

This is necessary to properly calculate the pre-funding ratio and to comply with the numerator/denominator consistency requirement in the fourth step of sections 8B and 8C of AG 38. The following example will illustrate this:

For simplicity, ignore the 7% allowable load and assume: no deductions from the shadow account; rather than a death benefit there is an endowment of $1200 paid at the end of the second year; mortality is ignored, and interest is credited at the end of the policy year. In the first year, 200% interest is credited up to a shadow account value of $100, and 0% on any excess amount. In the second year, 200% interest is credited up to a shadow account value of $400, and 0% on any excess amount. The valuation is done immediately after issuance of the policy, right after a premium of $100 was paid. The threshold amount is $100 in the first policy year and $400 in the second.

The $100 already paid will accumulate to $300 by the end of the first policy year and to $900 by the end of the second policy year. This is 75% of the full endowment benefit; in other words, the $100 already paid has pre-funded 75% of the full policy benefit.

If the shadow account necessary to fully fund the secondary guarantee is calculated assuming 200% interest, then this would result in $133.33. The pre-funding ratio would therefore be calculated to be 75%.

If the shadow account necessary to fully fund the secondary guarantee is calculated using the split interest rates, then the result would be $200, and the pre-funding ratio would be calculated as 50%. Although $200 is the actual shadow account value necessary to fully fund the guarantee, it may not be the value that should be used to properly calculate the pre-funding ratio. The purpose of the pre-funding ratio is to determine the value of the benefit provided by the excess premiums paid.

The next example will illustrate the impact of varying premiums loads:

For simplicity, ignore the 7% allowable load and assume: 200% interest is credited and there are no deductions from the shadow account; rather than a death benefit there is an endowment of $1200 paid at the end of the second year; mortality is ignored, and there is no load on the first $100 of premium paid in a policy year but any excess will have a load of 66.67%. The valuation is done immediately after the policy is issued, right after a premium of $100 was paid.

Similar to the first example, the $100 already paid will accumulate to $300 by the end of the first policy year and to $900 by the end of the second policy year. This is 75% of the full endowment benefit, and thus the $100 already paid has pre-funded 75% of the full policy benefit.
If the single payment to fully fund the secondary guarantee was the basis for the denominator of the pre-funding ratio, as it is for policies issued prior to 7/1/2005, and the load on the excess payment was used, then it would be calculated as $200. The first $100 would have no load while the next $100 would have a 2/3 load; resulting in a 50% pre-funding ratio. The result is therefore similar to that of the first example, when multiple interest rates are used.

The two examples with varying designs are provided to show their similarities and to make the point that in both cases the $100 premium already paid has pre-funded 75% of the full benefit. The use of only the 200% interest rate in the first example would have a similar result to non-recognition of the premium load in the denominator calculation for the fourth step of sections 8B and 8C.

**Submitting Party:**

Sheldon Summers, FSA, MAAA  
Actuary  
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August 22, 2013

Resubmitted October 18, 2013

**Response from the Emerging Actuarial Issues (E) Working Group Revised 12/3/14:**

AG 38, 8E, 8C, and 8B all provide the intent of the ratio in Step 4 is to measure the level of prefunding. Given the varying interpretations which the bifurcated solution and AG 38, Section 8D8E, strived to address, this response is qualified for issues within the scope of AG 38, Section 8E, only.

In general, the intent of the 8E ratio in Step 4 (i.e. to measure the level of prefunding) is only achieved if the charges and credits used in calculating the minimum amount required to fully fund the guarantee are reasonably consistent with the charges and credits expected to apply over the future course of the policy.

If this submission is addressed with respect to Section 8E, the unconstrained application of 0% interest on values above the threshold in calculating this minimum amount does not appear to be reasonably consistent with the charges and credits expected to apply over the future course of the policy.

The language provided in Section 8E, Step 4 regarding consistency of assumptions within the numerator and denominator serves as a guide to carry out this intent, but the intent prevails over dubious consistency.

However, if multiple sets of charges and credits apply to the policy, it may be difficult if not impossible to estimate is impossible to know precisely which the charges and credits will expected to apply over the future course of the policy, especially if the company does not have the experience.
For policies issued 7/1/2015 and later, in the case of multiple sets of charges and credits, the company should make try to make estimations that for each policy or at least in the aggregate would reasonably reflect the charges and credits expected to apply. Regardless of whether a company is able to do this or not, and in order to prevent unreasonably large results from the calculations in the first paragraph of AG38, Section 8E, Step 4, which would have the effect of reducing the ratio of Step 3 to Step 4 and thereby reducing reserves, any amount calculated in that paragraph with respect to policies issued 7/1/2015 and later shall be limited to be no larger than the net single premium using valuation assumptions.

November 22, 2013
November 7, 2014

Mr. Mike Boerner  
Chair – NAIC Emerging Actuarial Issues Working Group  
Re Exposed INT for Summers’ questions

Dear Mr. Boerner:

On behalf of the American Council of Life Insurers (ACLI¹), I am writing to provide some comments on the response to the Step 4 question raised by Sheldon Summers.

As ACLI proposed in December 2013, use of the valuation Net Single Premium as a limit to the pre-paid account value provides an objective determination of value, which can be consistently applied across all products, for those situations where the contract provides multiple sets of credits and charges. Suggested wording to implement this limitation as an interpretation of AG38 Step 4 is provided on the following page. This language amends the response proposed by the EAIWG in December 2013. Such a limit may have been the original intent of AG38, but it was clearly not articulated in the language of AG-38, so we believe that this can reasonably be called an “interpretation” of AG38 with prospective impact after a reasonable transition period.

We thank you for the opportunity to comment on this proposed interpretation and will be glad to answer any questions.

CC Reggie Mazyck, NAIC

¹ The American Council of Life Insurers (ACLI) is a Washington, D.C.-based trade association with more than 300 legal reserve life insurer and fraternal benefit society member companies operating in the United States. ACLI advocates in federal, state and international forums. Its members represent more than 90 percent of the assets and premiums of the U.S. life insurance and annuity industry. In addition to life insurance, annuities and other workplace and individual retirement plans, ACLI members offer long-term care and disability income insurance, and reinsurance. Its public website can be accessed at www.acli.com.
AG 38, 8E, 8C, and 8B all provide the intent of the ratio in Step 4 is to measure the level of prefunding. Given the varying interpretations which the bifurcated solution and AG 38, Section 8D, strived to address, this response is qualified for issues within the scope of AG 38, Section 8E, only. In general, the intent of the 8E ratio in Step 4 (i.e. to measure the level of prefunding) is only achieved if the charges and credits used in calculating the minimum amount required to fully fund the guarantee are reasonably consistent with the charges and credits expected to apply over the future course of the policy. If this submission is addressed with respect to Section 8E, the unconstrained application of 0% interest on values above the threshold in calculating this minimum amount does not appear to be reasonably consistent with the charges and credits expected to apply over the future course of the policy. The language provided in Section 8E, Step 4 regarding consistency of assumptions within the numerator and denominator serves as a guide to carry out this intent. However, if multiple sets of charges and credits apply to the policy, it is impossible to know precisely which charges and credits will apply over the future course of the policy. In order to prevent unreasonably large results from the calculations in the first paragraph of AG38, Section 8E, Step 4, which would have the effect of reducing the ratio of Step 3 to Step 4 and thereby reducing reserves, any amount calculated in that paragraph with respect to policies issued 7/1/2015 and later shall be limited to be no larger than the net single premium using valuation assumptions.
Amendment Proposal Form

AAA Life Reserve Work Group
Dave Neve, Chair

Modification to the treatment of the PIMR in the deterministic reserve

45 Day Exposure Draft

Comments accepted through June 1, 2013
Life Actuarial (A) Task Force
Amendment Proposal Form*

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

Dave Neve, chairperson of the American Academy of Actuaries Life Reserves Work Group.

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed: VM-20:

Section 9C for Principle-based Reserves for Life Products, Draft dated 12/2/2012, sections 4, 5 and 7.

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

Please see Appendix A.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

Proposal Summary

This amendment proposal would modify VM-20 to change the method for recognizing the effect of the Pre-tax Investment Maintenance Reserve (“PIMR”) when calculating the Deterministic Reserve (“DR”) and the Stochastic reserve (“SR”). The revised method simplifies the calculation of the DR and SR, and the reserves produced under this revision are equivalent to the reserves produced under the current VM-20 rules.

Background

The VM-20 reserve methodology (for both DR and SR) recognizes that IMR is redundant under a PBR regime as principle-based reserves are designed to adjust to changing economic environments and the characteristics of the assets backing the liabilities. Thus, the current VM-20 rules attempt to reverse the impact on surplus of recognized PIMR related to the asset segment supporting the liabilities. For the DR, the way this is done (in the case of positive PIMR) is by adding PIMR amortization to the numerator of the Net Asset Earned Rates (“NAERs”) and subtracting the PIMR beginning balance from the denominator of the NAERs projected in the asset-liability cash flow model. Both adjustments serve to increase the discount factors and consequently reduce the PVs of the modeled cash flows that determine the DR. The insight is that the VM-20 method is designed to reduce/increase the DR in the amount of the positive/negative PIMR allocated to the model. Viewed another way, VM-20 effectively allocates assets backing positive PIMR to the modeling of the DR.

Proposal for Modifying the VM-20 DR and SR Calculations

This amendment proposal would modify VM-20 to change the method for recognizing the effect of the Pre-tax Investment Maintenance Reserve (“PIMR”) when calculating the Deterministic Reserve (“DR”) and the Stochastic reserve (“SR”). With respect to the DR, the proposed method is to forgo adjusting the
modeled reserve through the modification of the NAERs and simply make a direct post-calculation reduction/increase to the modeled reserve in the amount of the positive/negative PIMR. With respect to the SR, the proposed method is to forgo adjusting the modeled statutory asset values at all projection durations for unamortized PIMR (arising from PIMR amounts existing at the start of a projection and amounts arising as a result of capital gains and losses occurring during a projection) and again simply make a direct post-calculation reduction/increase to the final CTE 70 reserve in the amount of the allocated PIMR.

**Reasons for Revising VM-20**

1. Mathematically, this revision produces equivalent reserves compared to those currently produced under VM-20.

2. The current VM-20 process is not transparent and the complexity of the process lends itself to errors. The effect of the VM-20 treatment of PIMR is poorly understood by many and will be a source of concern in practice. In the Impact Studies performed to date, companies ignored PIMR primarily due to complexity in its application. The alternative method proposed here is simple, direct and transparent.

3. Application of the current VM-20 method requires that dedicated PIMR amortization schedules be maintained and incorporated into the reserve calculations. This is avoided under the revised method.

4. Requiring starting PIMR to be modeled suggests that future PIMR developing at future projection durations should be modeled as well (VM-20 adopts this position). This creates more concerns:
   a. Including future PIMR in PBR models creates additional layers of unnecessary complexity.
   b. In projections where an asset sale results in capital gains that are used immediately for policy obligations and not reinvested, PIMR arguably should not be recognized.
   c. PIMR amortization may extend beyond a projection horizon, causing inaccuracies in the calculation of the reserve.
Appendix A

VM-01: DEFINITIONS FOR TERMS IN REQUIREMENTS

41. The term “pretax interest maintenance reserve” or “PIMR” means the statutory interest maintenance reserve liability adjusted to a pretax basis for each model segment at the projection start date and at the end of each projection interval. (Used in VM-20)

VM-20: REQUIREMENTS FOR PRINCIPLE-BASED RESERVES FOR LIFE PRODUCTS

Section 1. Purpose and Definitions

15. The term “pretax interest maintenance reserve” or “PIMR” means the statutory interest maintenance reserve liability adjusted to a pre-tax basis for each model segment at the projection start date and at the end of each projection interval.

Section 4. Deterministic Reserve

For a group of one or more policies for which a deterministic reserve must be calculated pursuant to Sections 2.A or 2.B, the company shall calculate the deterministic reserve for the group as follows:

A. Calculate the deterministic reserve equal to the actuarial present value of benefits, expenses, and related amounts less the actuarial present value of premiums and related amounts, less the positive or negative PIMR balance allocated to the group of one or more policies being modeled under Section 7.D.5, where:

1. Cash flows are projected in compliance with the applicable requirements in Sections 7, 8 and 9 over the single economic scenario described in Section 7.G.1.

2. Present values are calculated using the path of discount rates for the corresponding model segment determined in compliance with Section 7.H.4

3. The actuarial present value of benefits, expenses and related amount equals the sum of

   a. Present value of future benefits, but before netting the repayment of any policy loans;

      Guidance Note: Future benefits include but are not limited to death and cash surrender benefits.

   b. Present value of future expenses excluding federal income taxes and expenses paid to provide fraternal benefits in lieu of federal income taxes;

   c. Policy account value invested in the separate account at the valuation date; and

      Guidance Note: when paragraph c. is taken in conjunction with 4.b. below, the net result produces the correct cash flows as well as NAER,

   d. Policy loan balance at the valuation date with appropriate reflection of any relevant due, accrued or unearned loan interest, if policy loans are explicitly modeled under Section 7.E.
Guidance Note: when paragraph d. is taken in conjunction with 4.c. below, the net result produces the correct cash flows as well as NAER,

4. The actuarial present value of premiums and related amounts equals the sum of the present values of
   a. Future gross premium payments and/or other applicable revenue;
   b. Future net cash flows to or from the general account, or from or to the separate account;
   c. Future net policy loan cash flows, if policy loans are explicitly modeled under Section 7.E;

Guidance Note: Future net policy loan cash flows include: loan interest paid in cash; additional loan principal; and repayments of principal, including repayments occurring at death or surrender (note that the future benefits in Section 4.A.3.a are before consideration of policy loans).
   d. Future net reinsurance discrete cash flows determined in compliance with Section 8;
   e. The future net reinsurance aggregate cash flows allocated to this group of policies as described in Subsection B of this section; and
   f. The future derivative liability program net cash flows (i.e., cash received minus cash paid) that are allocated to this group of policies.

5. If a group of policies is excluded from the stochastic reserve requirements, the company may not include future transactions associated with non-hedging derivative programs in determining the deterministic reserve for those policies.

Section 5. Stochastic Reserve

The company shall calculate the stochastic reserve for all policies (pursuant to section 2.A) or for a group of policies (pursuant to section 2.B) as follows:

A. Project cash flows in compliance with the applicable requirements in Sections 7, 8 and 9 using the stochastically generated scenarios described in Section 7.G.2.

B. Calculate the scenario reserve for each stochastically generated scenario as follows:

   1. For each model segment at the model start date and end of each projection year, calculate the discounted value of the negative of the projected statement value of general account and separate account assets using the path of discount rates for the model segment determined in compliance with Section 7.H.5 from the projection start date to the end of the respective projection year.

Guidance Note: The projected statement value of general account and separate account assets for a model segment may be negative or positive.

   2. Sum the amounts calculated in Subparagraph 1 above across all model segments at the model start date and end of each projection year.

Guidance Note: The amount in Subparagraph 2 above may be negative or positive.
3. Set the scenario reserve equal to the sum of the statement value of the starting assets across all model segments and the maximum of the amounts calculated in Subparagraph 2 above.

C. Rank the scenario reserves from lowest to highest.

D. Calculate CTE 70.

E. Determine any additional amount needed to capture any material risk included in the scope of these requirements but not already reflected in the cash flow models using an appropriate and supportable method and supporting rationale.

F. Add the CTE amount (D) plus any additional amount (E) less the positive or negative PIMR balance allocated to the group of one or more policies being modeled under Section 7.D.5.

G. The stochastic reserve equals the amount determined in Subsection 5.F. If the company defines two or more subgroups for aggregation purposes as described in Section 7.B.3., the company shall calculate the amount determined in Section 5.F for each subgroup of policies.

Section 7. Cash Flow Models

D. Starting Assets

1. For each model segment, the company shall select starting assets such that the aggregate annual statement value of the assets at the projection start date equals the estimated value of the minimum reserve allocated to the policies in the appropriate model segment subject to the following:

   a. Starting asset values shall include the relevant balance of any due, accrued or unearned investment income.

   b. For an asset portfolio that supports both policies that are subject and not subject to these requirements, the company shall determine an equitable method to apportion the total amount of starting assets between the subject and non-subject policies.

   c. If for all model segments combined, the aggregate annual statement value of starting assets is less than 98% or greater than the larger of NPR or 102% of the final aggregate modeled (whether stochastic or deterministic) reserve, the company shall provide documentation in the PBR Actuarial Report that provides reasonable assurance that the aggregate modeled reserve is not materially understated as a result of the estimate of the amount of starting assets.

2. The company shall select starting assets for each model segment that consists of the following:

   a. All separate account assets supporting the policies.

   b. All policy loans supporting the policies that are explicitly modeled under Section 7.E.

   c. All derivative instruments held at the projection start date that are part of a derivative program and can be appropriately allocated to the model segment.

The negative of any pretax interest maintenance reserve liability that can be allocated to each model segment at the projection start date subject to the following:

The amount of PIMR allocable to each model segment is the approximate statutory interest maintenance reserve liability that would have developed for the model segment assuming applicable capital gains taxes.
are excluded. The allocable PIMR may be either positive or negative, resulting in either a decrease or increase to starting assets.

In performing the allocation, the company shall use a reasonable approach to allocate any portion of the total company balance that is disallowable under statutory accounting procedures (i.e., when the total company balance is an asset rather than a liability).

The company may use a simplified approach to allocate the PIMR, if the impact of the PIMR on the minimum reserve is minimal.

d. An amount of other general account assets such that the aggregate value of starting assets meets the requirements in Section 7.D.1. These assets shall generally be selected on a consistent basis from one reserve valuation to the next. Any material change in the selection methodology shall be documented in the PBR Actuarial Report.

3. The aggregate value of general account starting assets is the sum of the amounts in subsections 7.D.2.b through 7.D.2.e above.

Guidance Note: The aggregate value of general account assets in subsection 7.D.3 may be negative. This may occur, for example, for model segments in which a substantial portion of policyholder funds are allocated to separate accounts. The assets in subsection 7.D.2.e above may include negative assets or short-term borrowing, resulting in a projected interest expense.

4. The company shall calculate the projected values of starting assets in a manner consistent with their values at the start of the projection.

When calculating the projected statement value of assets at any date, the company shall include the negative of any outstanding PIMR. For purposes of these requirements, the projected PIMR for any model segment and for all model segments combined may be negative.

5. Under Sections 4 and 5, any pre-tax interest maintenance reserve (“PIMR”) balance allocated to the group of one or more policies being modeled at the projection start date is included in the calculations of the respective reserves. The determination of the PIMR allocation is subject to the following:

i. The amount of PIMR allocable to each model segment is the approximate statutory interest maintenance reserve liability that would have developed for the model segment assuming applicable capital gains taxes are excluded. The allocable PIMR may be either positive or negative.

ii. In performing the allocation to each model segment, the company shall use a reasonable approach to allocate any portion of the total company balance that is disallowable under statutory accounting procedures (i.e., when the total company balance is an asset rather than a liability).

iii. The company may use a simplified approach to allocate the PIMR, if the impact of the PIMR on the minimum reserve is minimal.

(Section 7 continued)

H. Determination of Net Asset Earned Rates and Discount Rates
1. In calculating the deterministic reserve the company shall determine a path of net asset earned rates for each model segment that reflects the net general account portfolio rate in each projection interval (i.e., monthly, quarterly, annually) in compliance with Section 7, which will depend primarily on:

   a. Projected net investment earnings from the portfolio of starting assets.

   b. Pattern of projected asset cash flows from the starting assets and subsequent reinvestment assets.

   c. Pattern of net liability cash flows.

   d. Projected net investment earnings from reinvestment assets.

2. The company shall calculate the net asset earned rate as the ratio of net investment earnings divided by invested assets subject to the requirements in a. – f. All items reflected in the ratio are consistent with statutory asset valuation and accrual accounting, including reflection of due, accrued or unearned investment income where appropriate.

   a. The impact of separate accounts and policy loans is excluded.

   b. The net asset earned rate for each projection interval is calculated in a manner that is consistent with the timing of cash flows and length of the projection interval of the related cash flow model.

   c. Net investment earnings include:

      i. Investment income plus capital gains and losses (excluding capital gains and losses that are included in the PIMR), minus appropriate default costs and investment expenses; and

      ii. Income from derivative asset programs; and

       Amortization of the PIMR

   d. Invested assets are determined in a manner that is consistent with the timing of cash flows within the cash flow model and the length of the projection interval of the cash flow model.

   Invested assets are adjusted to reflect the negative of the outstanding PIMR

   e. The annual statement value of derivative instruments or a reasonable approximation thereof is in invested assets.

All items reflected in the ratio are consistent with statutory asset valuation and accrual accounting, including reflection of due, accrued or unearned investment income where appropriate.

3. The company may use a grouped liability model to calculate the path of net asset earned rates for the deterministic reserve and then perform the seriatim reserve calculation for each policy based on those net asset earned rates.

Guidance Note: Section 7.A.2 permits the use of modeling efficiency techniques to calculate the deterministic reserve and stochastic reserve. This availability for simplification includes ways to determine appropriate net asset earned rates. Small to intermediate size companies, or any size company with smaller blocks of business, have options to create net asset earned rates with modeling efficiency techniques if the results are consistent with Section 2.H.
4. The company shall use the path of net asset earned rates as the discount rates for each model segment in the deterministic reserve calculations in Section 4, and the stochastic exclusion test in Section 6.

5. The company shall use the path of one-year U.S. Treasury interest rates in effect at the beginning of each projection year multiplied by 1.05 for each model segment within each scenario as the discount rates in the stochastic reserve calculations in Section 5.

**Guidance Note:** The use of different discount rate paths for the seriatim and scenario reserves is driven by differences in methodology. The seriatim reserve is based on a present value of all liability cash flows, with the discount rates reflecting the investment returns of the assets backing the liabilities. The scenario reserve is based on a starting estimate of the reserve, and assets that support that estimate, plus the greatest present value of accumulated deficiencies. Here, the discount rates are a standard estimate of the investment returns of only the marginal assets needed to eliminate either a positive or negative deficiency.

**Future Pretax Interest Maintenance Reserve Amounts**

The company shall spread realized capital gains and losses arising from changes in interest rates over future projection intervals by establishing a new PIMR amount and future amortization schedule in a manner that is reasonably consistent with statutory accounting procedures under the assumption that capital gains tax is zero.