To: Life Actuarial (A) Task Force

From: Felix Schirripa, Chair of VM-22 Subgroup

Re: Subgroup’s Proposed Work Plans for Your Review & Guidance

Purpose

The purpose of this memorandum is to seek your suggestions on the Subgroup’s near term work plans.

The Subgroup appreciates that the final work product could require special impact studies and full blown field tests, akin to those conducted for VM-20. However, the LATF members should know that the VM-22 Subgroup is not staffed to deliver a fully developed and tested VM-22 with all impacts explained.

Our charge is to “pose a PBR methodology for non-variable (fixed) annuities for consideration by the Life Actuarial (A) Task Force”. We would expect the methodology to apply only to new business written on or after the new reserve standard’s effective date. Existing business would continue to use the current reserve rules.

We note there are several ways one could design VM-22, the new statutory reserve standard for fixed annuities. Each approach comes with pros and cons.

The Subgroup is not yet ready to recommend its preferred blueprint for VM-22. However, we would all agree the methodology that’s ultimately selected as the foundation for the new reserve standard must “right-size” statutory reserves while also seeking to minimize the potential for unintended consequences.

VM-22 Foundation: Three Feasible Paths

The Subgroup identified six conceivable ways to design VM-22. Three of the approaches (i.e., the Canadian Method, the “Status Quo” Method, and Market Value Method) have been rejected by the Subgroup’s Chair.

The three most credible options for constructing VM-22 are:

I. Replicate VM-20, but with a stochastic “exclusion test” designed specifically for fixed annuities.
   This is arguably the most obvious option. The approach would include a formulaic floor, perhaps similar to the current AG 33 calculations.
A stochastic exclusion test would be developed for non-variable annuities, beginning with the VM-20 stochastic exclusion test using a company’s cash flow testing model and making any needed refinements for this product type, such as consideration of living benefits. Provision might be made for a simplified reserve calculation approach, perhaps based on the stochastic exclusion test, whereby a company could hold a reserve higher than minimum in order to avoid the additional complexity of the stochastic reserve calculations.

For the stochastic reserve, methodologies related to setting assumptions for base mortality, mortality improvement, surrender rates (both base and dynamic) and utilization of living benefits could parallel similar assumptions in VM-20. The stochastic reserve would then be based on using the economic scenario generator consistent with VM-20 and the stochastic reserve would be calculated using CTE70 of the distribution of stochastic scenario results.

Many in industry feel the approach is overkill for non-variable annuities, adding much unnecessary complexity to the statutory reserve process. The Subgroup agrees.

II. Representative Scenario Method (RSM)
This option is intended to closely approximate the reserve results that would be obtained ideally by using stochastic modeling of all key risk factors pertaining to a block of business. This RSM method would require far fewer computations than a full stochastic reserve and should be easier to audit, holding down costs for both companies and reviewers. Being a multi-risk approach, the resulting reserve would reflect all material risks contained in today’s more complex products.

For a block of business, this methodology involves an analysis of the key risk drivers for the block, such as interest rates/market rates, lapses/surrenders, utilization of living benefits, and mortality/mortality improvement. Central (best) estimate assumptions are set for each of these key risk drivers, including establishing distributions around the central estimate.

The types and parameters of these distributions around the central estimate could be established by regulators based on industry information collected by statistical agents, adjusted for the credibility of the industry experience. Taken together, these scenarios, including the central estimates and the distributions around the central estimates, comprise the Representative Scenarios, each with its own probability level.

Each of these deterministic Representative Scenarios is then run and the results are combined into a Current Estimate Reserve using the respective probability weights of each scenario. The Modeled Reserve would then be calculated by adding a margin to the Central Estimate Reserve. This margin could be calculated using (1) individual margins on the key risk drivers derived from the Representative Scenario results; or (2) an aggregate margin calculated using either the cost of capital method or the percentile
method, as described in the report from the American Academy’s Aggregate Margin Task Force.

This methodology may offer advantages, but it still requires more testing before the Subgroup is comfortable endorsing it.

Some remaining key issues include: how do we “validate” the method, what are some of the practical implementation issues for insurers, and what types of field testing will LATF require?

III. Modernize Current Formulaic/Deterministic Method (i.e., keep what’s working, correct what’s not)

The formulas set in the SVL work reasonably well for many fixed annuities. But where there are problems, fixes could be proposed by the Subgroup and presented to LATF.

To illustrate, for annuities with optional feature, such as living benefits, it may be possible to develop a deterministic methodology to set the statutory reserve for the contractual options. If so, deterministic fixes would be fleshed out by the Subgroup and then presented to LATF for further consideration, testing, and possible adoption.

A summary of the pros and cons of these options is provided in Attachment I. Of course, it’s possible that we may propose going with some combinations of the above methods, for example, Method II for some products or risk drivers, and Method III for others, or Method III could serve as the floor reserve with Method II as the modeled reserve.

Scoring the Plausible Options

To assist LATF in guiding our future work efforts, we “scored” these three approaches using the following criteria:

- Produces prudently conservative reserves (i.e., economic reserve plus pre-defined margin),
- Implementation is reasonably feasible for insurers and regulators, and
- Avoids unintended accounting/tax consequences.

Our score card is shown in Attachment II. The scores shown are representative of discussions by the Subgroup on an open call held March 4.

VM-22 Subgroup Work Plans

The Subgroup proposes focusing on these four major initiatives:

1. Flesh out methods of “validating” RSM
2. Solicit public comments on the pros and cons of these methods
3. Identify flaws in current deterministic/formulaic approaches, product-by-product (see attachment III for examples)

4. Propose fixes to correct formula flaws (see attachment III for examples)

We encourage the LATF members to provide feedback on these plans, especially if changes are wanted.
### Attachment I

**Pros & Cons of Valuation Methods under Discussion**

<table>
<thead>
<tr>
<th>Method</th>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>1. Replicate VM-20</td>
<td>• Feasible</td>
<td>• Complex</td>
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<tr>
<td></td>
<td>• More readily adaptable to new product features (Con?)</td>
<td></td>
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<tr>
<td>2. Representative Scenario Method (RSM)</td>
<td>• Simplifies stochastic computations</td>
<td>• Requires validation</td>
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<tr>
<td></td>
<td>• More readily adaptable to new product features (Con?)</td>
<td></td>
</tr>
<tr>
<td>3. Modernized SVL Formulas</td>
<td>• Maintains current deterministic/formulaic processes</td>
<td>• Requires product-by-product assessment of current state</td>
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<tr>
<td></td>
<td>• Reserves “right-sized” by correcting formulaic flaws</td>
<td>• New product features may require special study (Pro?)</td>
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<tr>
<td></td>
<td>• Pragmatic</td>
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### Attachment II

**Score Card Proposed by VM-22 Subgroup & Tentative Scoring**
(Scale from 0 to 10=perfect)

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Replicate VM-20</th>
<th>RSM</th>
<th>Modernize SVL Processes</th>
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<tbody>
<tr>
<td>Produces prudent reserves</td>
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<td>Reasonably feasible implementation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Avoids unintended consequences</td>
<td></td>
<td></td>
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<tr>
<td>All</td>
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# Attachment III

## Examples of SVL Fixes Needed to “Right-Size” Reserves

<table>
<thead>
<tr>
<th>Product</th>
<th>Formula Flaws</th>
<th>Potential Fixes</th>
</tr>
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<tbody>
<tr>
<td>Stable Value</td>
<td>Liability discount rate is capped at 1.05 times treasury yield, regardless of the portfolio’s achievable spreads</td>
<td>Adoption of Academy’s revisions to the Synthetic GIC Model # 695.</td>
</tr>
</tbody>
</table>
| Fixed annuities with optional living benefits | AG33 overstates utilization of optional benefits (by requiring 100% utilization at most expensive point).  
Incorrectly values option by setting the discount rate based on year of issue rates.  
This overstates the option value when rates rise, but understates it when rates fall. | Allow more realistic utilization, especially when credible utilization experience is available.  
Develop simplified option pricing method (e.g., carefully crafted deterministic scenarios), and/or use RSM. |
| SPIAs                          | SPIAs are priced using “spot” rates. Yet reserves are set using a “moving average” index rate.  
This approach works reasonably well, expect when interest rates are volatile and/or the SPIA has unusual liability characteristics (e.g., jumbo transaction, extremely long/short duration).  
The differences can lead to non-economic reserve impacts. | Refine the index rate setting process for unusual transactions (e.g., contracts in excess of $500 million) and provide prudent flexibility to adjust the index rate for SPIA transactions with unforeseen liability characteristics. |