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Session 6PD
Statutory Reserving Update—Annuity Products

Track: Financial Reporting

Moderator: JONATHAN L. WOOLEY
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Recorder: JONATHAN L. WOOLEY

Summary: This session provides an overview of recent and potential developments in statutory reserving for annuity products including:

- *Reserves for variable annuities with guaranteed living benefits*
- *Implementation of NAIC Actuarial Guidelines 33, 34, and 35 on annuity reserves*
- *New annuity valuation table update*
- *Proposed revisions to NAIC Actuarial Guideline 9-A on substandard annuity reserves*
- *Reserves for annuities linking returns to general account asset pools*
- *Reserves for guaranteed investment contracts with bailouts triggered by downgrades*
- *Changes to NAIC Model Actuarial Opinion and Memorandum Regulation*
- *Unified valuation system update*

Mr. Jonathan L. Wooley: I am with New York Life, and today we are going to cover a myriad of annuity reserving issues.

With all of the new individual and group annuity products developed in the last few years, both the reserving actuaries and the regulators have had to keep moving very quickly to keep up and make sure that the proper liabilities are held for these new and innovative products. The application of the Commissioner's Annuity Reserve Valuation Method (CARVM) to some of these new products can be subject to interpretation. We've already seen Actuarial Guidelines 33, 34, and 35 released for individual annuity reserving. Now Actuarial Guideline MMMM has been developed and exposed for variable annuities with guaranteed living benefits.

For group annuities, there has been the issue of book-value payouts under GICs in cases of insurance company downgrades. Other guaranteed contracts with investment performance based on asset pools have also been in focus. To make sure that we cover these topics thoroughly, I have asked two industry experts to address these and other issues.

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Jim Lamson, our first presenter, is going to speak on many individual annuity issues. Jim is managing principal of Actuarial Resources Corporation where he manages the overall software development and support and also heads up the marketing department. Jim has been an actuary in the life and health industry for 27 years, spending the early part of his career in the life and annuity product development arena, then shifting to an emphasis in financial reporting over the last 15 years. He has participated in AAA work groups, such as the one that revised Guideline 33. He is currently serving on the Variable Annuity Guaranteed Living Benefits (VAGLB) Work Group, which has just proposed a new guideline for those benefits. He has spoken on several occasions at SOA meetings and has written several articles relating to CARVM reserve calculations.

Mr. James W. Lamson: I will cover 3 topics: reserves for VAGLBs; implementing Actuarial Guidelines 33, 34, and 35; and a new annuity valuation table update. I will be spending most of my time on VAGLBs. However, there continue to be many open questions on Actuarial Guidelines 33, 34, and 35. In addition, you should be aware of the new mortality tables that apply to annuity valuation.

A VAGLB attempts to address the problem, "Can I at least get my money back from a VA, or will I be left holding the bag?" Getting your money back on death is provided by guaranteed minimum death benefits (GMDBs). But if you live can you either get your money back (maybe including interest), or at least be able to annuitize it?

One fairly simple example of a guaranteed minimum accumulation benefit, or GMAB, is 5% accumulation of premiums with the account value (AV) set to this value if GMAB is more than the AV at the end of a ten-year waiting period. In this example, say a couple of years before the end of the ten-year waiting period the market has gone south, leaving the AV below the 5% accumulation of premiums. Typically, a GMAB provision boosts the AV back up to the minimum accumulation at the end of the tenth year, thus improving all values of the policy from that date forward: cash surrender, partial withdrawals, annuitization values, and so forth. It is important to note that this is just a simple example of a GMAB type of VAGLB. It can get pretty complicated in real life, and the guarantee may be expressed as a ratchet of the AV—for example, a maximum anniversary value (MAV), where the guarantee is the maximum of the AVs on all previous anniversaries.
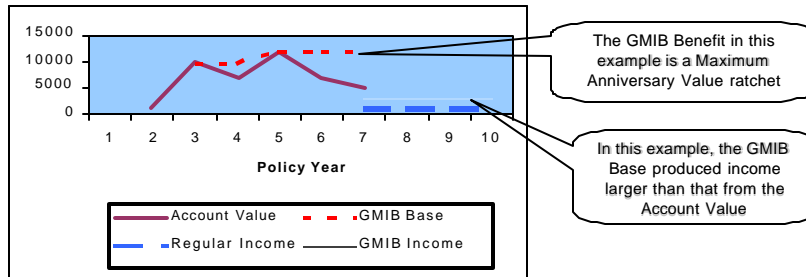
The example below involves an MAV style of VAGLB, but rather than having the AV boosted up to the guarantee at the end of the waiting period, the enhanced value is only available for annuitization. This type of VAGLB is called a guaranteed minimum income benefit, or GMIB.

CHART 1

Example: Guaranteed Minimum Income Benefit (GMIB)

> ➢ Policy must be annuitized to gain benefit
> ➢ Only valuable if, at end of 10 year waiting period, GMIB base
>   annuitized at guaranteed rates > AV annuitized at current rates

The GMIB Benefit in this example is a Maximum Anniversary Value ratchet

In this example, the GMIB Base produced income larger than that from the Account Value

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As you can see from the chart, there is an up-and-down line indicating performance of the variable funds over time, and a dashed line indicating the guaranteed annuitization value, which, since this is an annual ratchet, only goes up and never goes down. Notice that there are two additional graphs on the right side—they start at the end of the waiting period and are after annuitization has occurred. At the end of the ten-year waiting period, the policyholder can elect an annuity benefit—either the income produced by the guarantee applied to the guaranteed income rates, as represented in Chart 1 by the finely dashed line, or from applying the actual AV to the company's current income rates, as represented by the heavy dashed line. The approach taken in this example of annuitizing the GMIB by using guaranteed, rather than current, income rates can reduce the cost of the guarantee, inasmuch as the guaranteed income rates are less favorable than the current rates.

So, the basic question is, "How to apply CARVM to a benefit, the value of which I cannot project?" As you know, CARVM determines a reserve by first having you consider the present value (PV) of all possible integrated benefit streams (IBSs). VAGLB benefits need to be reflected in those IBSs. But, if future fund performance is good, then the VAGLB benefits don't come into play. But, if future fund performance is bad, they will definitely have value, and that value might be very large. So, what do we put into the PV of IBSs for these benefits? This is the same type of question as applied to the valuation of GMDBs. So, what is needed? An actuarial guideline, of course!

As with the creation of many other actuarial guidelines, the Life and Health Actuarial Task Force (LHATF) of the NAIC requested that the AAA appoint a work group to assist in the development of the new guideline. So, it was created, and chaired by the annuity valuation superheroes, namely Tom Campbell and Steve Preston. This

group has been working at solving this problem for more than three years! I've been a member for about two of those years, and I can testify that a tremendous amount of work has been done by the members of the work group. If you would like to participate or receive copies of the copious amounts of information distributed via e-mail, just contact Steve English at the AAA. We have created a new draft actuarial guideline, currently dubbed "Quad-M," or MMMM. It was released for exposure by the LHATF in Dallas at its last quarterly meeting in September. One recent development was the adoption by the California Insurance Department of Bulletin 2000–03 on October 2, 2000. It specifies that reserves must be computed as described under "Quad-M", or as later revised or adopted formally by the NAIC. MMMM applies to all policies containing VAGLBs issued after January 1, 1981, and will be effective on December 31, 2001.

Since projecting the value of living guarantees is similar to projecting the value of GMDBs, it was natural to pattern the new guideline after Actuarial Guideline 34. However, unlike the primary risk under AG 34, where the concern is providing for death benefits (DBs) payable if the market goes in the tank in the near future—that is, short-term market volatility—the primary concern for VAGLBs lies with both volatility and long-term underperformance of the funds relative to the guarantees. The draft guideline is consistent with AG 33 in that it specifies the evaluation of IBSs, and the cost of the VAGLBs is reflected in these IBSs. Like under AG 34, the VAGLB costs are reflected in IBSs using Net Amounts at Risk (NARs), which perform as surrogates for the actual benefits that might be paid in the future. These NARs are determined by projecting benefits that would be received if the VAGLB was not present, and projecting the guaranteed benefits under the VAGLB, and taking the difference. However, how should we project these benefits?

First let's consider how to project the VAGLB guarantee. There may be a formula in your contract that can be used to determine guaranteed benefits. Remember my example of a GMAB that was a 5% rollup of premiums? In that example, the projection is easy—all you have to do is accumulate the premiums at 5%. However, it may not be that easy, as with the popular form of a one-year ratchet benefit—that is, the MAV guarantee, which will require that the AV be projected first—as this will then determine the VAGLB guarantee. Now, for projecting the AV, you will need to first determine accumulation rates from a conservative fund return scenario, and reduce these scenario rates by asset-based charges for regular mortality and expense (M&E) charges, the specified additional charge for the VAGLB benefit (if separate from the regular M&E), any administration charges that are asset-based, and finally, for the fund charges assessed by the fund manager.

Let's consider an example. Table 1 shows a very simple IBS, where only cash surrenders and DBs are considered.

TABLE 1
SAMPLE INTEGRATED BENEFIT STREAM

	Simplified Expected Benefit Payments			
t:	1	2	3	4
CVs	968.55	1,025.61	1,085.59	1,148.62
AVs *qx	1.50	1.89	2.31	2.76
Subtotal PVs	906.58	897.45	888.05	878.39
NARs	0.00	0.00	0.00	290.86
Total PVs:	906.58	897.45	888.05	1,100.28

VAGLB Reserve = 1,100.28 - 906.58 = 193.70
This is an extreme example!

Real-life examples must consider partial withdrawals and annuitizations, but we will ignore all that for now. We've also shortened the horizon to consider a GMAB type of VAGLB having a remaining waiting period of only four years. Row 1 in the table represents the expected values of projected benefits to surrendering policyholders. Row 2 represents the expected values of DBs paid to policies projected to terminate because of death. And, Row 3 presents the total PV of these expected benefit payments. Thus, if there were no VAGLBs, and these were the only IBSs you had to consider, the greatest present value (GPV) would be $906.58, which is the largest of the amounts in Row 3 captioned "Subtotal PV's." However, you will need to do projections to determine NARs to represent the cost of the VAGLB benefit. Those amounts are shown in Row 4, and are all zero prior to the end of the waiting period, but jump up to a considerable amount in this contrived example. Note that, as with AG 34, the projections of benefits for NAR determination are done on a different basis than for the non-VAGLB benefits, such as cash values and regular DBs. Finally, adding the PV of these NARs to the PVs in Row 3, we have all the PV candidates used in this example for determining the GPV. You'll notice that the "CARVM duration", or where the GPV occurs, is now shifted from the first policy anniversary following the valuation date to the end of the waiting period, and the GPV jumps considerably to $1,100.28, shown in the lower right-hand corner of the table. So, if we were to hold the non-VAGLB GPV as our reserve for the separate account, we could solve for the amount to hold in the general account for the VAGLB guarantee. This example is extreme. It was chosen only to illustrate the calculation process.

So, to intentionally understate the process of calculating the NARs, we can see that it is as easy as A-B-C! Step 1 is to project the VAGLB guaranteed benefits, either using policy formulas or keying the guarantees off projected AVs from the next step. Step 2 is to project the AVs using conservative scenarios, and Step 3 is to subtract these projected AVs from the VAGLB guaranteed benefits to arrive at the NARs. The draft guideline specifies that in determining the NAR for a GMIB, you subtract the projected AV from the PV of the income payments provided. The question remains, however, "How do we come up with these conservative fund return assumptions for projecting the AV?"

In determining the NARs, you need to categorize your funds according to the same 5 asset classes as in AG 34. Thus, the projections must be done to reflect different assumptions for the different types of funds represented in your in force. There are three ways of performing these AV projections. The first method, while appealing from a theoretical perspective, is probably not practical to perform except for a company having large computers and a small number of policies in-force. That is, you can use fund returns determined stochastically, but must average the results obtained from a large number, such as 1,000 such scenarios. However, the prospect of doing this for every policy is daunting. Nonetheless, with only 10,000 or so policies in-force, this might be a viable option. The next stop up the chain of practicality is to use a stochastic process to determine a manageable number of scenarios meant to represent the large number, such as 1,000 stochastically determined scenarios. We came up with the very imaginative name of "representative scenarios" for these. In general how does one develop representative scenarios? No one knows. But, you're talented, have lots of computer power, and, unlike the job that has been facing our work group, you already know the features of your product, so you have a big jump on us. We were trying to figure out something that worked in the general case. You are required by the draft guideline to test your required scenarios using a model of your in force or expected in force, and do reserve calculations using the representative scenarios and compare them to those from the stochastic scenarios. Once you've arrived at acceptable representative scenarios, you can then use those scenarios to apply to each and every policy in-force in doing your CARVM reserve valuation. In any event, using either the stochastic method on each policy, or developing and programming the use of representative scenarios will likely leave your head spinning. Finally, the third approach is to use a type of representative scenario that the work group developed, called the Keel Method. This deterministic scenario works well for many VAGLB designs, but cannot be used for certain types of VAGLBs as I will explain later.

Much of the time spent by the VAGLB Work Group was spent trying to develop a deterministic approach to projecting the AVs for NAR determination. Much experimentation was done by members of the group, including our moderator, Jonathan Wooley. The group finally developed and thoroughly tested a method called the Keel Method for projecting AVs. It works well for many VAGLB designs, but breaks down in some circumstances. The primary area where this method does not seem to properly project values used for the NAR is when the VAGLB guarantee is "path-dependent". You can see what this means by considering the GMIB example I presented earlier. The example involved a minimum annuitization benefit defined in terms of previous AVs – specifically, as the MAV. The VAGLB guarantee depends on the path of assumed fund returns, and this is what "path-dependent" means. You may not use the Keel Method for VAGLB designs that are path-dependent. The draft guideline (a copy of the guideline is available from the AAA) specifies the conditions under which you may use the Keel Method so you won't need to develop your own representative scenarios. Your product must fit in the safe harbor required for using the Keel Method. There are other requirements besides not being path-dependent, and I will get into them in a little bit.

Here is the formula for the Keel Method:
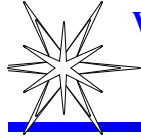
What is the Keel Method?

$$Index_t = Index_{t-s} \times e^{m_s + Ns\sqrt{s}}$$

Where: $Index_t$ = the index at time t

m = mean fund index return (stationary over time)

s = fund index volatility (stationary over time)

s = period in years between t-s and t

N = 1-p percentile of cumulative normal distribution (p=83.3^{do}%)

Developed by Tim Hill and Noel Abkemeier
Market returns assumed to be normally distributed, with mean and
standard deviation converted to lognormal mean and standard deviation

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You can see that it assumes a normal distribution of market returns. The Keel formula derives cumulative returns according to the parameters specified in the formula. To use the Keel Method, you must use the Keel formula to calculate the 83 and one-third percentile worst cumulative returns based on the mean returns and volatilities for each asset class as specified in the draft guideline. Using these cumulative returns, you can derive annual rates of return to use in your projection formulas, if needed.

The cumulative returns from the Keel formula generally match the historical returns reasonably well. Also if you graph the returns using the Keel formula it looks a lot like the keel of a boat, which is why Tim Hill, who is the member of the work group that performed all the numerical testing of the Keel Method, gave it the name it has.

These are the requirements for qualifying for safe harbor use of the Keel Method. First, the VAGLB must be one of the four types listed. These are all defined in the draft guideline. Besides the two I have previously described, there are guaranteed minimum withdrawal benefit designs, and guaranteed payout annuity floors, which are for immediate annuities. The VAGLB may not be path-dependent. The VAGLB benefit must be defined as an accumulation of premiums or stated as a guaranteed amount in the contract. Partial elections of a GMIB may not be allowed under the terms of the contract. Finally, the contract may not provide the policyholder with the option of resetting the VAGLB, such as when a policyholder could elect to start

the waiting period over and treat the current accumulation as if it was a new premium.

The draft guideline contains examples of VAGLB designs; some of which qualify for the Keel, and others that do not. The following are some examples of safe harbor disqualifiers:

- MAV
- Option to restart (i.e., treat AV as new premium with new guarantee)
- Rollup of premiums at the London Interbank Offered Rate (LIBOR)
- Each premium has its own guarantee
- A bonus after "n" years of a percentage of AV

A few examples we've not yet talked about are: a) the rollup at LIBOR, which constitutes a path dependency; b) attaching a separate guarantee to each premium payment; and c) the presence of a path-dependent bonus.

What do you do if your product does not qualify for the safe harbor? You could use the stochastic method on every policy—in which case, you'll put a lot of strain on your computer systems—or you get the opportunity to develop representative scenarios, which will put a lot of strain on you!

To develop representative scenarios, you must test proposed scenarios on "models" of your business in-force or that you expect to issue. Just like before, it's as easy as A-B-C! Yeah, right! First, you have to generate 1,000 stochastic scenarios for use in projecting the AV for each cell in your model and calculate "solved-for" VAGLB reserves for each scenario as the excess of the integrated reserve with the VAGLB over the integrated reserve ignoring the VAGLB. Then you have to calculate the VAGLB "solved-for" reserve derived using each of your representative scenarios and develop a set of proposed weights to apply to the reserve resulting from each representative scenario. Then you have to rank the 1,000 VAGLB reserves from the first step to determine the percentile achieved by the reserve obtained by weighting the reserves from each of the representative scenarios. You then have to determine, for the model of your business used for this testing, if the reserves derived from your representative scenarios are appropriate. If this was easy, the work group would have developed a generalized methodology that applies to all business, instead of just falling into that safe harbor.

So, if your product does not qualify for the Keel, then you must adhere to the requirements set forth in the draft guideline. Specifically, you must annually certify to the appropriateness of the representative scenarios and weights used for reserve calculation. You must maintain documentation at your company of the testing performed in support of the representative scenarios. And you must monitor the business actually written and other emerging factors that could affect the appropriateness of the representative scenarios.

To allow for reinsurance in the reserve held in your annual statement, the draft guideline specifies a methodology just like that in AG 34; that is, that you calculate the reserve net of reinsurance, and then solve for the credit, which may be positive

or negative. You calculate an integrated reserve by reducing projected benefits in the NARs for reinsurance recoveries, and add the reinsurance premiums as if they were additional benefits in the IBSs. The resulting GPV is the reserve net of reinsurance. Note that this may occur at a completely different CARVM duration than for the direct reserve.

For the assumed VAGLB Reinsurance Reserve, the reinsurer calculates the GPV reserve using the benefits it will pay under the scenarios and reduces this for premiums received. Note that the reinsurer is to use the same assumptions as the direct writer.

Most VAs with VAGLBs will likely have other guaranteed benefits as well, such as MGDBs. The draft guideline specifies that a "holistic" approach be taken. What this means is that you calculate a single integrated reserve with NARs determined separately for VAGLBs and MGDBs. Then, you subtract whatever reserve you hold in the separate account, and the balance is the reserve to be held in the general account for all guaranteed benefits. Finally, you can split the total general account reserve into components for each guaranteed benefit.

Now let's turn our attention to Actuarial Guideline 33, which was first adopted by the NAIC in 1995, but was revised in 1998. It introduced many new features into annuity valuation, such as IBSs, elective and nonelective benefits, valuation interest rates varying by the type of benefit, and use of incidence rates for nonelective benefits.

AG 33 valuation can be bewildering in trying to assess the proper combination of benefits for each IBS, and there continue to be many areas of interpretation of the guideline.

The construction of IBSs requires that you consider any possible combination of elective benefit utilization by the policyholder. Once the elective benefits are determined, you fit the nonelective benefits around them using assumed incidence rates. Note that the nonelective incidence rates are also involved in the determination of the number of lives remaining in the stream to receive the elective benefits.

There are five factors to consider in pulling the correct valuation rate out of the Standard Valuation Law grid of rates—issue year vs. change in fund; the presence of cash settlement options; and whether there are guarantees of interest on future premiums, are all based on the policy as a whole. Plan type and guarantee duration are determined based on the benefit being valued. In calculating the PV of benefits, the expected value of each benefit is discounted by multiplying it by the survival probabilities based on the nonelective incidence rates. An example of this is to

apply p_x to the payment of future cash-surrender values, i.e., PV of Cash Surrender

$$v^t \ _t p_x \ _t CV_x$$

Now let's turn to the subject of Minimum Guaranteed Death Benefits, MGDBs, which provide a floor of DBs regardless of variable fund value performance. Actuarial Guideline 34 deals with how to include the cost of an MGDB into IBSs. AG 34 broke new ground by establishing a methodology of including into CARVM the value of benefits that is impossible to calculate using deterministic methods. As with Quad-M, the guideline specifies the use of NARs as surrogates for the real benefits.

It was determined that the greatest risk in providing these benefits is short-term market volatility. Therefore, the NAR is to be determined using prescribed drops in value with subsequent grow-backs. By subtracting these depressed funds from the MGDB amount, the NARs can be determined.

As with MMMM, there are five asset classes to consider and a new mortality table for valuing the NARs in IBSs, just like AG 33. As with MMMM, subtracting the separate account reserve from the integrated reserve provides the reserve for the general account. As with reserves for VAGLBs, the amount by which the benefit is "in the money" on the valuation date has a tremendous effect on the size of the resulting reserve. Calculations are difficult, so you should get a fast computer!

Actuarial Guideline 35 addresses the question of how to integrate the cost of options embedded in equity-indexed annuities (EIAs) into CARVM. It applies to all EIAs. There are two classes of methods provided: book value and market value.

The single book-value method is EDIM, or the Enhanced Discounted Intrinsic Method. There are two parts to the reserve—a fixed part and an equity component. To use the method, you must be "hedged-as-required."

CARVM Updated Market Values (CARVM-UMV) is the first of the Type 2 methods and involves adding the cost of the options required to hedge the benefits in excess of the guaranteed benefits to the projected guaranteed benefits. The value of the options is accumulated with valuation interest to the point at which indexed benefits appear in IBSs.

MVRM, or the Market Value Reserve Method, can only be used with products having a "dominant benefit" and is the second of the Type 2 methods. The market value of the option needed to hedge that dominant benefit is used to define the value of the index, with interim index values derived by assuming a constant compound growth rate. The resulting index values are then used to determine all benefits in the IBS.

Finally, MVRM with Black-Scholes provides a modification to handle guarantees shorter than the term of the dominant benefit and is also a Type 2 method. It uses

the cost of an option to hedge the dominant benefit only to the end of the first guarantee period, and accumulates this cost at risk-free rates to determine the growth of the AV. This method is applied successively on all subsequent periods, with the resulting AVs used to determine the values of the index.

The balance of my presentation provides you with a quick rundown of the new annuity mortality tables, which have been adopted by more than thirty states using the NAIC model regulation.

Table 2 provides you with a time-line representation of which mortality tables apply to individual annuities issued during particular periods. The official table for each period is shown above the time line for particular periods, and the optional tables are shown below the time line.

TABLE 2
RECAP OF INDIVIDUAL MORTALITY TABLES

1971 IAM	**1983 - a Table**	**Annuity 2000**
1983-a Table (optional)	Annuity 2000 (optional)	Annuity 2000
Adoption of 1976 Amendments	Original Adoption of NAIC Regulation	Adoption of Current NAIC Regulation

Finally, I have specified the beginning and ending points for the use of each table below each hash mark on the line. Notice that with each period, the mortality table for the next period can be optionally used during that period, since lower mortality results in higher reserves.

Table 3 is just like the last one, except it specifies which tables may be used for group annuities.

TABLE 3
RECAP OF GROUP MORTALITY TABLES

1971 GAM	**1983 GAM Table**	**1994 GAR**
1983-a Table or 1983 GAM or 1994 GAR (optional)	1994 GAR, or (optional)	
Adoption of 1976 Amendments	Original Adoption of NAIC Regulation	Adoption of Current NAIC Regulation

Ms. Donna R. Claire: I get to talk about a number of other topics that are being discussed at the NAIC.

Proposed Changes to NAIC Actuarial Guideline IX-A (IX-C)
Actuarial Guideline IX-A is the guideline for the use of substandard mortality for structured settlements. In it, there is a statement that reads, "Because the experience and methodology are still emerging for substandard annuities, it is expected that this whole subject will be reviewed again in the not-too-distant future...whether or how it might be acceptable to apply similar standards to substandard nonsettlement annuities." This guideline was passed more than 11 years ago. In regulator-eze, the "not-too-distant future" has now arrived. There is now a proposed revision that has variously been called the update to Actuarial Guideline IX-A, or by the number it may eventually get, which is IX-C. This will apply to nonstructured settlement substandard annuities. These income-paying annuities will be covered if, and only if, the expectation of life is reduced and the premium charged so reflects this.

Actuarial Guideline IX-C does have some conditions in order for an annuity to qualify for substandard annuity treatment. In order not to have an adverse impact on the overall sufficiency of annuity reserving, only those policies being issued to truly substandard annuitants are covered. The definition is that there is at least a 25% reduction in the expectation of life. This eliminates including a write-down for such items as the smoking status only to qualify in this category. The methodology proposed is to use a constant addition to the mortality rates, consistent with that in Actuarial Guideline IX-A.

Actuarial Guideline IX-C was exposed for comment at the last NAIC LHATF meeting in September 2000. It does not appear to have any major opposition from either the industry or the regulators. The only comments I have heard from regulators are that the premiums charged are expected to have a consistent reduction with the reserve reduction. This guideline is available at the NAIC's Web site, *http://www.naic.org*.

Reserves For Annuities Linking Returns to General Account Asset Pools
These products are annuities that promise interest-rate crediting according to a certain method. Originally, these annuities promised interest based on a specific investment philosophy. For example, one could have chosen to have interest credited based on the yields of high-yield (also known as junk) funds, convertible bonds, etc. The insurance company did not promise to invest in these assets precisely; they just promised that the interest credit rate would be based as if that was what the assets were invested in. In effect, the crediting rates were not just based on coupon rates, but instead followed a total return philosophy. The newer products, instead of specifying a specific asset category, may instead invest for a short-term, medium-term, or long-term focus. There are not that many companies in the market.

There are a number of questions raised with respect to these products. For example, how does such a product avoid SEC registration? The companies in this

market obviously think it does. Their reasoning is that the credited rates are not based on a set of specified assets but are instead left to the company. The reserving for these products is also in question. One answer for this is that it may be similar to indexed annuity reserving, where excess interest may be required if the rates credited exceed the valuation rates for the product. It would appear that the best investments for the products would be to follow the promised methodology (e.g., invest in high-yield bonds for anyone who chose the high-yield bond option, or in short-maturity bonds for those who chose the short-maturity option), and to keep the assets segmented. There may be limits imposed on the insurance company as to how much of certain assets (e.g., high-yield bonds) the company can invest in, which need to be considered in the sale of these products. Of major concern to a number of regulators is disclosure to the consumer. For example, with a total return product invested in bonds, it is likely that the rates declared would go down if interest rates increase, since the worth of the bonds will decrease. This may be difficult for some consumers to understand.

The concern regarding these types of products was brought up by Mr. Larry Gorski, the actuarial regulator from Illinois. There are other regulators who also expressed some concern. However, because of the number of projects on the NAIC's LHATF's plate at this time, action on this issue has been put on hold. There are individual states that may choose not to allow the product, or that may set up their own marketing and reserving review. If the product becomes more popular, I expect that the NAIC may develop rules.

Liquidity
Perhaps one of the hottest regulatory topics at the NAIC is liquidity. Liquidity is one aspect of risk management, although certainly not the only one. It came to the forefront because of the situation with General American. General American had a number of factors that hit simultaneously, causing a liquidity crisis. These factors included the issuance of $6 billion in funding agreements which allowed the customers to demand the book value of the contract from the insurance company with as little as seven-days notice. In addition, there was a problem with the company that had been reinsuring 50% of the risk. Also, many of their assets could not immediately be liquidated without a substantial haircut. Liquidity is also a major topic with rating agencies. For example, Standard and Poor's has developed a questionnaire that assigns factors to the assets and liabilities, and develops a liquidity ratio. Moody's is also very interested in this, and was one of the parties that brought the General American liquidity question to the public. The NAIC has a Life Liquidity Risk Working Group, chaired by Neil Vance of the New Jersey Department of Insurance. There is also an AAA group, chaired by me, which is studying this issue, and has issued a draft paper on this. The final paper will be made available on the Academy Web site at *http://www.actuary.org*.

In general, stress liquidity scenarios, would, for most companies, be considered outside the realm of probable scenarios, so many appointed actuaries may not pay that much attention to this. However, there are definitely times when liquidity risk should not be ignored. For example, if the probability of a liquidity crisis is within the realm of reasonable scenarios, it should be tested. One way this could happen is if

a company has large amounts of funding agreements that can be triggered if the company's rating falls below AA3. If the company is at AA3 now, liquidity certainly should be looked at. Also, if there is any current problem with day-to-day liquidity, such as large liability maturities coming due, but the assets are in long, illiquid securities, this should be examined by the appointed actuary.

There are many products that present potential liquidity risks. This is a subject that many actuaries will probably need to get more familiar with. The General American situation was, as mentioned previously, triggered by funding agreements with short put options. There are also other institutional products that can cause large amounts of money to move with little warning to the insurance company. For example, there are corporate-owned life insurance contracts and variations thereon (such as bank-owned life insurance contracts), where insurance is issued on individual lives, but there is an institution controlling the fate of the contracts. Individual insurance contracts can also move. For example, if a company gets bad publicity, a number of agents and their clients may demand their cash values. Standard GICs can also allow for cash-outs in certain circumstances. Another relatively new risk for reinsurers is a provision being added to many new contracts which allow the ceding company to cancel the treaty and get the book values of their reserves back with no penalty if the reinsurer's credit ratings drop below a certain amount. There are also provisions in some assets that make them less liquid. For example, a number of customized assets are now being developed for insurance companies that can provide high ratings and higher yield, but at the expense of liquidity. There are also some derivative instruments, such as swaps, that can be unwound at the current value if one of the party's credit rating falls. Some insurance companies also provide liquidity backstops to other companies, which can cause a liquidity strain.

Since liquidity is becoming important for a number of companies, one must know the risks and be able to measure liquidity exposure. There are a number of ways liquidity risk can be managed. For example, in the normal course of investment management, one would not want all assets to mature simultaneously—instead, a laddering of maturities is preferred. On the liability side, one would not want huge amounts of GICs, for example, maturing at the same time. Some companies set up a limit as to how much of certain products— for example, funding agreements with put options—they will write. Other companies will purchase liquidity in terms of bank credit lines. One can also purchase custom-made credit or liquidity derivative instruments. Another choice is to set aside capital to cover liquidity exposure.

The New York Insurance Department has taken the most action with regard to liquidity. They issued Circular Letter 35 in 1999, which asked a series of questions regarding liquidity. Depending on the answers to these questions, the department followed up with another series of questions, and, for some companies, invited them in for a discussion. The New York Department is in the process of revising their interrogatories, and expects to send it to all companies doing business in New York sometime in the next month or so. The answers will be based on December 31, 2000 data, and will be due back to the department on April 1. Illinois has an informal process of handling their companies. They discuss products with potential

liquidity problems with the company, and may ask the company to revise or withdraw contracts with certain features. Other states are also inviting companies in to discuss liquidity concerns.

Actuarial Opinion and Memorandum Regulation (AOMR)
The changes to the AOMR are making progress. From the actuary-in-the-street point of view, the most important change would be the possibility, that the rules that require that the opinion must meet the requirements of every state, might be lessened. The proposed change is that each state can decide which type of opinion to require. They can choose the current standard, which is that it meets the requirement of that state. Alternatively, they can choose to accept the state of domicile opinion, plus some stated standards and conditions. These stated conditions may range from nothing to a favorite couple of regulations (such as Regulation XXX on term insurance), to anything they want. Another possibility is that each company can ask a state to accept their state of domicile opinion. A third approach would be for the state to accept the domiciliary opinion plus information that shows a comparison of codification reserves to actual reserves.

The proposed changes to the AOMR eliminates the exemption for small companies, which currently allows the Section 7 opinions. Therefore, all life insurance companies, regardless of size or type of business, would be required to perform asset adequacy analysis. This is consistent with the proposed changes to the Actuarial Standards of Practice (ASOPs). Another proposed change to the AOMR says that the ASOPs, not the regulation, will go into detail as to what testing method may be used for different products, and define the rules to be followed. The point of the change is to give regulators more confidence that the company's reserves are adequate. One thing they do want to make clear is that cash-flow testing is not required in all instances. For many companies, the tests they are currently doing to prove to management that the business is profitable can be used.

Another change to the AOMR is a requirement for a Regulatory Asset Adequacy Issues summary, which would be due by March 15 of each year. This summary is similar to the ones already required by Illinois and California. Like the rest of the regulation, there is more reliance on the proposed changed ASOP as to what would be covered.

The changes to the ASOPs include the elimination of *ASOP 14* on when to do cash-flow testing, since the information on this is proposed to be covered elsewhere, specifically in *ASOP 7* or *ASOP 22*. Also proposed is the elimination of *Actuarial Compliance Guideline No. 4*, since it is also proposed that the Section 7 opinions that this Guideline covers would be eliminated. *ASOP 22* does expand the discussion on alternatives to cash-flow testing.

The proposed revised AOMR was discussed at the September 2000 NAIC LHATF meeting, and was exposed for comment. The proposed changes to the ASOPs were released for comment at the September Actuarial Standards Board meeting.

Unified Valuation System (UVS)
Work on revising the reserving system in the U.S. using what is known as the UVS was begun three years ago. This was after almost two decades of work on the same subject at the NAIC's LHATF. An Academy of Actuaries task force did this work. The UVS Task Force started with a "clean sheet of paper"—no preconceived limitations—for a reserving system. Dave Sandburg now chairs the group. It reported to the NAIC's LHATF on a quarterly basis.

Part of the Academy's task force assignments for UVS included a paper on the advantages and disadvantages of various reserving systems compared to the current system. This paper was completed. They have also completed a paper cataloging different possible reserving methodologies. Another paper that was written was on the reserving systems used in different countries. Other assignments were a draft of a model regulation and a draft of an actuarial opinion under UVS. The Academy group also provided drafts of these. Another assignment is to develop numerical examples. They have shown numerical examples at several NAIC meetings, and are still working on refining this.

The new valuation system would be based on principles, not formulaic rules. This would allow substantial judgement, and therefore substantial responsibility, for the actuary. There would be a range of possible outcomes for the level of reserving, and two actuaries may not get the same answer. This UVS approach could be used for reserves and risk-based capital (RBC). For example, reserves could be set so that there is an 85% probability that they will be sufficient, and RBC could be set so there is a 96% probability that they are sufficient.

Recently, the UVS group has produced a viability analysis, which is a sort of sufficiency of the company analysis. This covers such things as liquidity and risk management. They have also been refining numerical examples. The SOA is also funding research into UVS concepts.

The Academy work on UVS is nearly done. There is a seminar on November 8, 2000 in Philadelphia on modeling. The NAIC's LHATF regulators are generally supportive of the work done. The sticking point still remains the industry. For many in the industry, it is easier to live with a system one knows than to contemplate a new one. I believe that the current system is broken, and that eventually a system like UVS will be adopted. My only hesitation is predicting how long it will take for that eventuality to pass.

From the Floor: Could we turn to Jim's last example of safe harbor disqualifiers, the bonus after *n* years of a percentage of AV? I guess I may be misinterpreting you, but why is that any different from an immediate bonus percentage on an AV along with a surrender charge that is dollar for dollar the same amount for *n* years? In other words, let's say you have a VA with a 4% bonus, which a lot of companies are issuing now, and it has an additional 4% surrender charge for *n* years. The company would normally invest 104% of the consideration in the separate account. I don't see why that item is really there, unless the immediate bonus example I just gave is also included for some reason.

Mr. Lamson: Let me restate my understanding of the question. I listed several things that disqualify a product from use of the Keel Method, and the last one is for a product with a bonus *n* years after issue that's expressed as a percentage of the AV. What it really amounts to is that this type of bonus makes a product path-dependent; therefore, the Keel Method isn't allowed. Now, what you brought up is something else that should also perhaps disqualify use of the Keel.

The problem undertaken by the safe harbor definition is that we're trying to attack the issue of whether or not the Keel Method does a good job of projecting the value of the VAGLB. What you brought up might be another design that should perhaps also disqualify use of the Keel. I think we'd need some more consideration of that.

Ms. Claire: At least you know what the dollar amount is on Day 1. I will admit the problem that we are having is exactly how do you do CARVM for regular VAs? That question is not answered with this. But the theory is that, at least on Day 1, you knew what the bonus was. With the surrender charges I'm not quite sure where you wind up, but I can see there's a potential difference there.

From The Floor: I was pleased that Donna encouraged people to read the exposure draft. I don't want to be accused of nitpicking, but it's important, I think, for members to realize that these are simply proposals of the Life Committee. There's no position being taken, and it's very important in terms of due process that people realize that these are really exposure drafts and that comments are welcome. Thank you.

Ms. Claire: Yes. I should have stated these are proposals, which I did in the speech, and obviously all comments are welcome. That's why I mentioned when you see them, there are a number of changes in there, that you may want to comment on.

Mr. David L. Swanson: With respect to guarantees for VAs in general, reserving for those, what discussions have the work groups had around capital market hedging programs and potential offsets for those?

Ms. Claire: This is one of my favorite ones. I'm actually a member of the VAGLB group, and I will admit at the last NAIC meeting I commented on a similar proposal. The Academy group is about to kill me, which is why neither of them actually admits that I'm a member of it. Yes, there has been some discussion. The theory is if you come up with a hedging program for it, the reserving should be consistent so that there's not a mismatch on the liability and the asset side. So, if you actually are hedging the business such that you're reducing risk, let's not have a disconnect with the reserves. Unfortunately, with the Keel Method, , you can. It is one of the things that states are wondering about also. So, basically on the regulator's side it is still an open issue. On the EIA side we did exactly that. In effect, if you did the hedging properly, the reserves would line up with the assets. Right now we don't have that connect on the VAGLBs.

Mr. Jan C. Brown: I've been sitting in on some phone calls of this group, and we appreciate all the work you've been doing over the last several years. It's voluminous work, and you've really looked into these things. But one thing I'd like to comment on—you're probably expecting this—is the VAGLBs on the 83rd percentile. I actually did some stochastic testing and did a thousand scenarios for a VAGLB at-issue, what the reserve would be, and what it would look like. I did 1,000 scenarios, and at the 83rd percentile there's no cost at all. These VAGLBs are something called a long-tail risk, and all the cost of these benefits are in the higher percentiles, really after the 83rd percentile, up to the 100th percentile. So, one of the problems we regulators have is that at the 83rd percentile you end up with less than the expected cost of the reserve for that, and that's a big concern. We've also been looking at what Canada is doing, and they've come up with a different answer. They say go ahead and do stochastic testing. So, maybe the computers in Canada are faster than the ones in the U.S.

Ms. Claire: Yes. For vanilla life and annuities, typically reserves are at a 45-degree angle, whatever, so 83rd is a reasonable thing. However, for something like a VAGLB you're talking about a very steep slope right at the end. What Jan, for example, has suggested is to use the expected mean of the scenarios, and you do wind up with a different answer. So, one thing I do want to point out is, yes, it's a proposed guideline. Yes, there are still a number of open issues that the regulators are looking at and not feeling that comfortable with—the number of the products out there right now.

Mr. Lamson: Given that Quad-M has been exposed for comment, we would appreciate comments back to the AAA VAGLB Work Group and the LHATF as well.

Mr. Willis B. Howard, Jr.: I was one of the people who raised their hands, Donna, when you asked if there were any Section 7 companies out there. What's the effective date when that goes away, or is there one yet?

Ms. Claire: There is not one yet. Because it's a regulation, it has to be adopted by the states and actually has not even made it through the NAIC process yet.