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Summary: This guideline was adopted in 1995, and many companies estimated their reserves. As 1996 year-end draws near, a number of issues need to be reviewed:

- *success in getting states to accept three-year spread,*
- *implementation issues,*
- *effect of Actuarial Guideline (AG) 33 on new contract wording,*
- *accuracy of early estimates.*

Mr. Robert J. LaLonde: I am a vice president with PolySystems, Inc. Also presenting are Greg Broer, second vice president with Western National Life Insurance Company in Houston, and Paul Facey, senior vice president and chief actuary with National Western Life Insurance Company in Austin, Texas.

I assume that many people have determined their liabilities under AG 33. How many estimated the impact as opposed to actually calculating it exactly? (About ten people raised their hands.) How many feel like they evaluated it exactly, looking at all the options? (Seven hands are showing on that one.) With respect to the people who estimated, how many discovered that they overestimated their reserves? (There is at least one.) How about those who felt that they underestimated their reserves? (Three hands.) Was everybody successful in getting a three-year spread? (No hands raised.) How many did not get a three-year spread? I assume everybody then had the three-year spread. How many took the three-year spread? (Five hands showing.)

I happen to work with a software company, and we have developed software to calculate annuity reserves in exact accordance with AG 33. There were some unusual things that we had to do as a software vendor to meet our clients' needs. We have many companies who had a desire for the valuation system, but many companies had unique provisions in their policy forms. This made it challenging to write a generalized approach that would solve all companies' problems. We try to cover the waterfront and have options that would fit a multitude of policy form provisions. There are always some special things that have to be addressed.

Another dimension for a software vendor is the fact that not everybody has a uniform interpretation of AG 33. We have to provide for different ways that clients could evaluate their annuities and work with that in our system.

We have to provide software that could allow a user to look at the impact of partial withdrawals. That is where reserves are most often underestimated. The test for the 93% floor is not very hard. Usually people made a prior decision about whether or not a contract would have a 93% floor. Selecting interest rates for the annuitization option was a challenge because almost all interest rates are determined in terms of duration from issue. With the annuitization rules, valuation rates change according to the time since issue of the annuitization. Variable contracts typically have surrender charges based on premium receipt dates so we developed a way to capture the premium date for the proper determination of the surrender charge. If the contract had partial withdrawal provisions, you need to know whether there was a prior partial withdrawal and how much is available to withdraw in the current year. Many contracts have fund buckets with interest rates based on when the deposit is received. Interest rate guarantees could either be policy-year oriented or calendar-year oriented. The list goes on. Our challenge was to put all these features into software that could be used by a number of different companies in the insurance industry.

Once you write the system to make the calculations, you must consider how to report results and show your work. You need to provide trace files that would show the results of making many calculations and testing for the greatest present value of different paths. AG 33 says we have to compute the greatest present value of many different future cash flows including annuitizations and other benefits. That could result in many different benefit streams being played out and calculated. We had to think about routines that would show the various paths tested and demonstrate the relative values of all the paths.

Let me bring you up to date on what the Life and Health Actuarial Task Force (LHATF) has been working on. I wrote an article, "An Overview of New Actuarial Guideline 33", in the *Financial Reporter* (August 1995), about what I thought AG 33

meant. The LHATF did not agree with my interpretation. I suggested evaluating each benefit stream separately. I was using the net single premium approach to evaluate benefit streams. This was useful for testing the accidental death benefit that pays two times the fund value. I would calculate a net single premium for that and compare that value to the values for other types of benefits. I proposed comparing the greatest present values on each contract anniversary of cash benefits to net single premiums for nonelected benefits. I suggested holding whichever one of those gave the largest value.

The Life and Health Actuarial Task Force has subsequently decided that what they really want is an integrated multiple benefit stream approach. This is a complex concept. An American Academy of Actuaries (AAA) work group has been studying AG 33. They finally concluded that the thoughts expressed in my paper were consistent with AG 33, but if the task force wants to have an integrated multiple benefit stream interpretation, then we need to further clarify AG 33. So it now appears that AG 33 will be expanded.

They want to subdivide the benefits that might be available in an annuity into two forms, one being nonelected benefits and the other being elected benefits. I think of nonelected benefits as being occurrence-related benefits. Those are benefits that might be paid on death or disability. The elected benefits would be the benefits that the annuitant could elect, such as an annuitization, surrender, or a partial withdrawal. How do we blend those to consist of benefit streams that comprise both benefits types?

They provided some examples for us to think about. Pure elected benefits might be partial withdrawals followed by a full surrender, partial withdrawals followed by a full annuitization, or partial annuitizations followed by a full surrender. These are cash flows where elections are made by the policyholder.

The general rule they want to follow for elected benefit valuation is that there is not going to be any adjustments for probability of an occurrence. On an annuitization, you would not adjust the reserves for the percentages of people who might annuitize into the future.

From the Floor: It is just on the elected benefits?

Mr. LaLonde: Yes. It is just going to be on the elected benefits. You can use probabilities with the nonelected occurrence related benefits.

AG 33 says to test for the greatest present value at each contract anniversary. There is nothing in AG 33 that says we have to do continuous month-by-month analysis.

For the nonelected benefits, we want to be able to use occurrence rates or incidence rates, so we would have tables that would apply death rates, disability, and nursing home rates to the benefits. The question then becomes, what is going to be the appropriate basis for those calculations and how would we determine the discount rates? Would we still use discount rates that are related to the annuity as a whole, or use the interest rates that are appropriate for the benefits that are being valued. Then we have to have routines which will spin out all the potential integrated multiple benefit streams.

Here are some examples of integrated multiple benefit streams. Let's say a policy includes death and disability benefits. Typically, all that is provided is the waiver of the surrender charge upon death or disability. One stream might include deaths and disability benefits (with double decrement logic), followed by annuitization of the survivors. Another might be a stream of free partial withdrawals with deaths and fund surrenders to the survivors. A third stream would look at only full surrenders. We want to take a look at all those different streams and compute the greatest present value of all the integrated multiple benefit streams. We would look at contract anniversary values to find which one has the greatest present value. So, we have more work ahead of us.

In conclusion, let me caution that we found that if you are going to write programs to evaluate the reserves, it takes a great deal of attention to detail. Annuity reserving is very complex and you have to think through a number of issues to get it done correctly.

Mr. Gregory S. Broer: There has been and continues to be abundant debate over how to interpret and apply the Guideline. I have tried to stay on top of that. I will tell you what I know and what my company has been doing, and what we have in mind for 1996 year-end and beyond.

My company is Western National Life. We are based and domiciled in Texas. We wrote to the state last year-end asking for their blessing of our plan to grade annuities over three years. They wrote back with no objection because they had not adopted the Guideline and did not know when they would. We are putting it in place, because it is unavoidable. We are doing it over three years, because it is easier than all at once. Western is largely an annuity company. Maybe 1% of our reserves are for life insurance products. The rest of the reserves are for immediate and deferred. Deferred reserves are our long suit. At mid-year we had \$6,331,000,000 in account values, and before the effects of AG 33, we had statutory reserves of \$6,219,000,000. The question in our minds is how much of that difference do we lose because of the Guideline?

Our main competition is from banks. Our customers are often choosing between certificates of deposit (CDs) and deferred annuities, so we keep our products fairly simple. A typical Western single premium deferred annuity (SPDA) has a one-year guarantee of the initial interest rate. That usually includes a first-year bonus of 100 basis points, so the renewal rates drop a percentage point. There is a return of premium guarantee and a five- to seven-year surrender charge expressed as a declining percentage of the single premium. Our newer products have other benefits such as, accidental death benefit riders and a waiver of surrender charge in the case of nursing home confinement. That is a minority of our business so far. Our average issue age is about 65. I computed some test reserves involving nonelected benefits. They involve incidence rates, whereas for the elected benefits, such as surrender or annuitization, the calculations mirror old-fashioned commissioners' annuity reserve valuation method (CARVM) reserving.

A year ago Bob wrote his article for the *Financial Reporter*. There was no universal agreement on Bob's method, so the National Association of Insurance Commissioners (NAIC) LHATF sought the help of the Academy. I talked to a few members of the work group assigned by the Academy to clarify or shed some actuarial light on the Guideline, and while there has been some resolution of the matter, there is not yet a single definitive interpretation of the Guideline, but they are headed towards one. The work group had been taking some heat both from regulators and from industry, and I would say it is largely undeserved. They have got an almost impossible task trying to bring some actuarial reasoning and reasonability to a guideline some would say is hard to defend, and the NAIC has them on a short leash. They are not free to rewrite the Guideline the way they want to. There are definite constraints in place. Whatever they produce though, will be an improvement over the Guideline and we will be in their debt. They deserve our thanks.

Their research has looked at the Guideline in its published form and its draft forms, and they saw language indicating that the tests listed for cash value tests and annuitizations were meant to be suggestions and not just a checklist. We can expect a rewrite to include language that says these are things we would consider, but it is not the universe. They went to the NAIC with arguments for using utilization rates on elected benefits and in particular annuitization. The NAIC replied that there were enough areas of liberality in CARVM and that they could not justify adding one more.

They also dug into original CARVM, the work that led to it, and saw no justification for excluding incidence rates for nonelected benefits. They took their findings to the NAIC, which is favoring the 100% election rates for elected benefits, but allowing incidence rates for nonelecteds. We can look forward to a rewrite of the Guideline at the NAIC's December 1996 meeting. It will likely suggest three

tests: cash value, annuitization, and what Bob described before as an integrated benefits task.

One thing that likely will not be changing in the Guideline is determining interest rates for the valuation of annuitizations. There are two aspects to it. First, if the benefit period is shorter than five years, we use the lower Type C rates. For longer period certain payouts we can use the higher Type A rates. We also will use the policy duration at the assumed election date as the guaranteed duration for looking up the rates, so that annuitizations occurring in the years 11–20 have lower rates than those occurring in earlier durations. I bring it up because it is part of one of my following examples.

Before Guideline 33 came along, Western was using continuous CARVM. We considered the need for reserves for other benefits and found them to be immaterial and highly inconvenient to calculate. For expedience, we stuck with simple continuous CARVM focusing only on surrender benefits. Our cash-flow tests showed our reserves to be adequate. I think that is where many of us were put out with Guideline 33 because, based on cash-flow testing, everything appeared to be adequate. There is no apparent need that I can see for these higher reserves called for by AG 33.

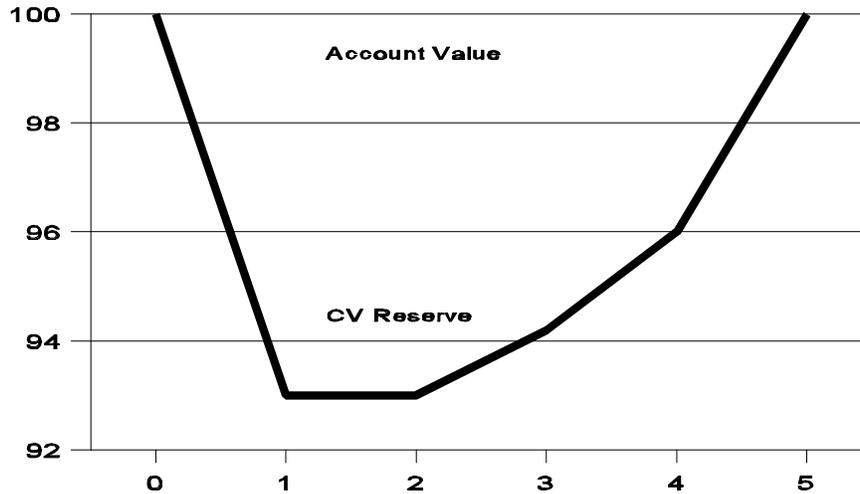
For the time being, until we have a clarification of the Guideline, we are following the method in Bob's article. Our riders are giving us no impact at all. Death benefits are giving us a sliver. The real story lies in annuitization. We have put a pencil to the paper and found two worse-case situations. The first is a fixed period term certain annuitization over the shortest possible period. The other is life only annuitization in one particular situation. That gives us, in effect, two annuitization tests. We take those with the cash-value tests, and compute the highest of the three as our basic result.

For the time being, we are simply using our old fashioned continuous CARVM reserves as our cash-value test. Chart 1 shows the cash-value reserve as a refund of account value. It begins with 100% because of our guaranteed return of premium. It bottoms out at about 92.5% in year two, and then climbs back to 100% as the surrender charge expires. I think of this pattern as the valley of CARVM.

Table 1 shows values for short-term period certain annuitization associated with a 1994 issue, with a three-year minimum payout period, and a 4% interest rate for both accumulation and annuitization. The valuation date is June 30, 1996. The valuation rate is 5.5% because the payout period is shorter than five years. The ratio of the factors is 98%, indicating that it takes 98% of the fund value to provide

the reserve for that annuitization. You can combine that with the valley of CARVM and see that the Guideline has, in effect, flooded the valley, as seen in Chart 2.

**CHART 1
CASH VALUE TEST
CARVM RESERVE AS PERCENTAGE OF ACCOUNT VALUE**



**TABLE 1
SHORT-TERM PERIOD-CERTAIN ANNUITIZATION**

Valuation	$\ddot{a}_{\overline{3} }^{(12)} 5.5\%$	2.778
Guarantee	$\ddot{a}_{\overline{3} }^{(12)} 4.0\%$	2.835
Ratio		98.0%

Table 2 shows that life only annuitizations may cause you no trouble at all. These are also 1994 issues valued at mid-1996. In these cases, the 1983 group annuity mortality table underlies both the guarantees and the valuation calculations. The ratios do climb with attained ages, but they are all nicely below 100%, so there is no real problem. Trouble can arise with a mortality mismatch, as we see in Table 3. The valuation factors match the ones in Table 2. The guarantees here are based on the 1971 individual annuitant mortality table and we have trouble. For age 90, it

takes more than the full account value to provide the life-only annuitization reserve. We do have many older policyholders and these situations are expensive.

CHART 2
G33 RESERVE AS PERCENTAGE OF ACCOUNT VALUE

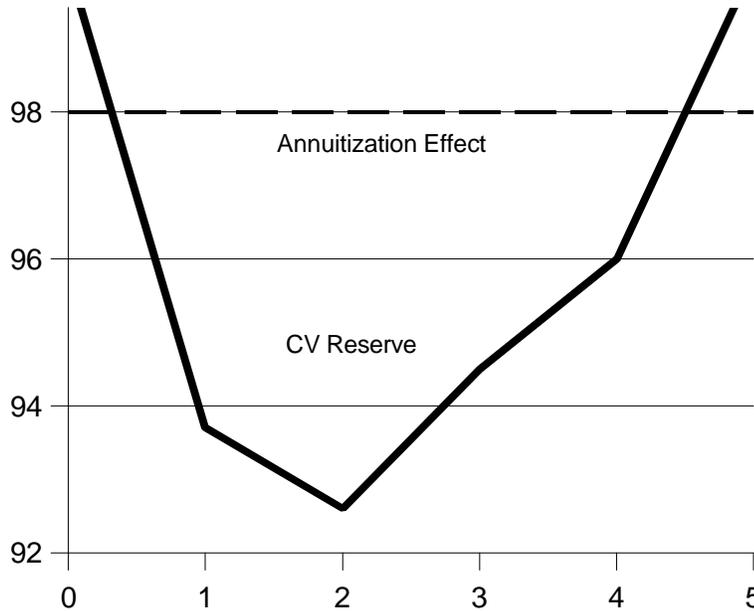


TABLE 2
LIFE-ONLY ANNUITIZATION
WITH MORTALITY MATCH

Annuity Factors			
Age	Valuation	Guaranteed	Ratio
70	8.934	10.661	83.8%
80	6.300	7.137	88.3
90	4.063	4.409	92.2

From the Floor: Are you using 4% interest in both examples?

Mr. Broer: Yes, for the guarantees. The Guideline says look not only at the valuation date, but at future dates as well. For the 90-year-old, Table 4 shows a broken table. The annuity factor ratios keep climbing. They get ugly. Their present values are determined by first bringing them forward with the 4% accumulation guarantee, and taking them back with the valuation rate. Notice the valuation rate drops for duration 11 from 6.5% to 6%. The largest present value is 124% for attained age 99. We are to assume that this 90 year old person will survive to age 99, and then she is a life only annuity. It is not the most likely of scenarios. This

has used only interest to bring the values back. If a revised Guideline 33 gives us the right to use decrements of mortality, it would have a result much nearer the 116% section for attained age 90, and we are hoping for that.

**TABLE 3
LIFE-ONLY ANNUITIZATION
WITH MORTALITY MISMATCH**

Annuity Factors			
Age	Valuation	Guaranteed	Ratio
70	8.934	10.044	88.9%
80	6.300	6.543	96.3
90	4.063	3.502	116.0

**TABLE 4
WITH MORTALITY MISMATCH**

Dura- tion	Age	Annuity Factor Ratio	Valuation Rate	Present Value of Ratio
2	90	116.0%	6.50%	116.0%
3	91	119.6	6.50	116.8
•	•	•	•	•
•	•	•	•	•
•	•	•	•	•
10	98	143.9	6.50	119.0
11	99	147.4	6.00	124.2
12	100	148.9	6.00%	123.1

We have two algebraic facts. The short-term period of annuitization can eat into the reserve difference under old fashioned CARVM, and life only annuitization can consume more than the fund value. The Guideline says to assume that everybody chooses the most expensive option at all times, and that is certainly conservative, but it is also grossly unrealistic, at least for my company which has experience like this. I studied our life contingent annuitizations and grouped them by initial periods certain, as seen in Table 5. Most chose 10 years, but 14% chose a true life only annuitization. Overall, less than 1.5% of our customers annuitized at all. Of those, one-fifth chose a life-contingent payout and then 14% choose the life only. When

the Guideline says assume 100%, our rate is 0.014%. It is roughly a ratio of 7,000 to 1. When I do sensitivity testing, the first multiplier I think of for decrements is not 7,000, it is much less than that.

TABLE 5
SCILCs BY INITIAL PERIOD CERTAIN

Period Certain	Percentage
0	14.2% Life-Only
1-9	17.5
10	59.1
11+	9.2
Total	100.0%

I applied the same exercise to our period certain annuitizations. Table 6 shows the results. A majority chose 5 years fixed, 10 years comes in second, and a minority of 17% chose true short-term payouts. Only 0.5% annuitize at all, 80% chose a fixed period, 17% choose 5 years or shorter, and the result is again microscopic at 0.068%.

TABLE 6
SCNILCS BY PERIOD CERTAIN

Period Certain	Percentage
<5	16.9%
5	44.4
6-9	8.4
10	28.4
11+	1.9
Total	100.0%

Our riders are giving us no impact at all at least under our current estimation process. Death benefits give us a sliver and we are not yet addressing free partials. Our surrender charges typically apply to surrenders of principal so that the interest accrual is already free and clear, so there is, at best, a very tiny effect of us considering free partials.

There are other practical matters. First is which method to use. I think it is reasonable to say that nobody knows when the Academy work group and the NAIC will reach a meeting of minds and we will get a revised Guideline. Until then, the best

we can do is stay tuned to their activity. It may be of some benefit to talk to your state insurance departments for their ideas or preferences, and get familiar with these calculations so you know what kind of data requirements they have, so you can think about how to corral that data and channel it into the calculations. Second is containing the problem. We are pretty much stuck with things as they are for our in force, but we can control new issues. Talk to your product people about revising your policy terms. For life contingent payouts, go for the lowest interest reasonable and make sure your mortality table matches the current valuation table. You can go further than that by constraining annuitizations, making it unavailable in the first few policy years, or even basing it on the cash value, which would totally eliminate extra reserves from this contingency.

For short-term period certain annuitizations, it may be sufficient just to link them to the payout period. Table 1 had an example giving us a 98% ratio based on a three-year payout. I changed that to five years and the ratio drops for two reasons. One is because of the longer period. Second is the valuation rate change because of the longer period going from 5.5% to 6.5%. I have left guaranteed interest rates unchanged. We can change them to 3% and get a very nice result of 92.4%. This can be compared to the valley of CARVM, and it looks at least like the problem is solved, as seen in Chart 3, but note that the cash value reserve graph is generic. It will differ from issue year to issue year and from product to product. If your product does not have a guaranteed return of premium, you will have not a valley, but a slope. We can do more. We can constrain annuitization making it unavailable in the first three years. We have a longer payout period, a lower interest rate and no annuitization possible in the first three years. Chart 4 shows reserve results.

**CHART 3
REDUCING PAYOUT GUARANTEES**

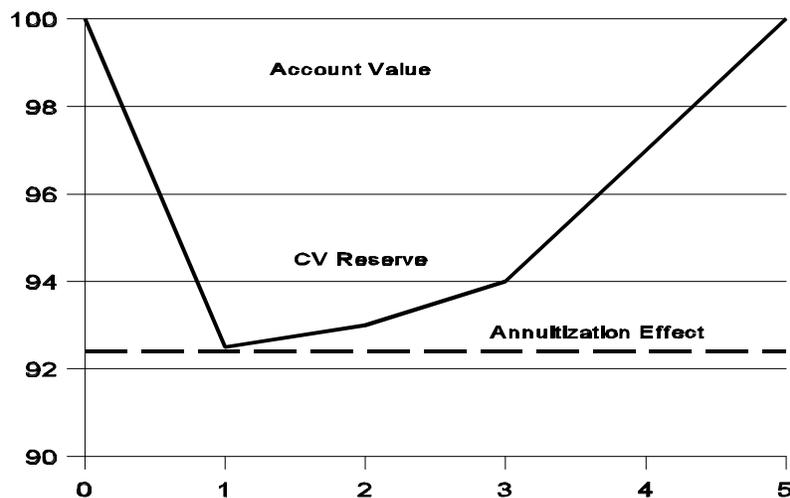
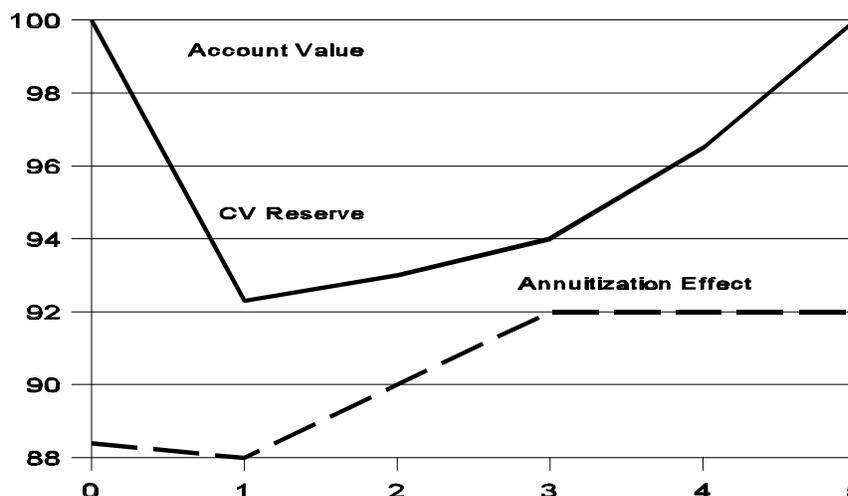


CHART 4
FURTHER REDUCING GUARANTEES



The third practical matter is estimates. To do more estimates, we are grouping our in-force business by policy form, issue year, and attained age. We are applying the Guideline to large subsets of that model population and then extrapolating to the whole. I have been asked not to tell you dollar amounts of our estimates, but I can tell you they have changed since last year-end.

Right now the issues of 1995 are at about the bottom of the valley. Those of 1993 are approaching their fourth anniversaries. The reason our estimates increased during the year is because we have included 1995 sales, which are nearly 150% of 1993 sales. We simply have more business in the deepest water.

Tax reserves is fourth. I am not qualified to offer tax advice, but I can tell you what we did. We refiled our 1994 return with tax reserves based on the standard valuation law as seen through the prism of Guideline 33, that is assuming the worst for annuitization. The statutory reserve at that point in time gave us a fairly low ceiling or low cap, so we had a modest amount to spread. But with our grade-in of AG 33 on the statutory side for 1995, 1996, and 1997, we are getting some very nice deductions with the increased cap. I can recommend this treatment.

Software is the fifth practical matter. In my opinion, software will be difficult and costly to get in place. It is one thing for you or me to do a worksheet or other small scale program, or to do some test calculations, but doing a whole revised valuation system is a different matter. We talked with different vendors about their software and its AG 33 features and in the end, we chose to write our own. The software we saw was impressive. The price tags were impressive, but not by any means prohibitive. What settled the issue for us was we believe our products are simple enough that we could write our own software with relative ease. It is not going to be easy,

but it will be feasible, it will be possible, and we view the purchase versus write your own decision as not solving the data management aspect of it. We want to have our software underway. We have had several false starts so far, but given the state of flux the Guideline is in, it has not been a real problem. We are looking at improving our estimates by targeting more policy forms in our direct application of the Guideline.

As unpleasant as Guideline 33 has made things for us, I view it as a significant short-term pain and a long-term minor inconvenience. In the short term, we have the cost of changing our valuation software and setting up more reserves, which is an unwelcome burden. In four or five years, our current policyholders will surrender or die, pass through the valley of CARVM, or annuitize. In four or five years, these extra reserves will be largely behind us.

We are already modifying our policy forms, constraining benefits that are already seldom used, so that we can minimize or avoid the effects of the Guideline, so that, in the end, our customers will have somewhat constrained benefits and the NAIC can sleep better at night.

Let's keep in mind that Guideline 33 is merely a piece of regulation, it is not the infallible truth, and it is not gospel. With that in mind, I leave you with these words of encouragement and hope. The NAIC is my shepherd, but am I a sheep? It saps up my surplus, it leavith me in the paths of reserve redundancy. Yes, though I walk through the valley of CARVM, I will fear no annuitization. Guideline 33 art with me, but I knowest not what to do.

Mr. Paul D. Facey: I have been struggling with AG 33 for quite some time and I would like to give you a bit of history about my company and what has gone on. I like to think of AG 33 as a continuing nightmare or at least a bad dream in some respects. While it seems innocuous on the surface, complete implementation is often more difficult than it seems.

The nightmare begins. My company, National Western Life, is domiciled in Colorado. Colorado sent us a notice describing the reserve methodology for multiple benefit stream annuities. I believe this was the original thinking behind the development of GGG. Basically it said that the valuation assumptions had to be the same for all benefits within a particular policy. This meant that for two-tier and other annuities the annuitization benefits, and all benefits for that matter, had to be valued using Type C valuation assumptions. This was something that most companies offering two-tier annuities at the time were not doing.

GGG went through many phases in the Life and Health Actuarial Task Force before being sent to the NAIC for adoption eventually as AG 33. The Colorado notice and the original versions of GGG would have caused a very high reserve increase for my company and this, therefore, sparked our early interest in this process and hence, the start of my nightmares.

We started working with Colorado in the summer of 1992 in an attempt to resolve the issue. This included some asset/liability matching work on our large two-tier annuity block, which represented the bulk of our annuity reserves at the time. We performed some industry surveys for the NAIC, paid for some consultant work, and provided some theoretical input on just what the most appropriate reserve formula might be. It paid off, because before GGG was finalized in 1994, National Western had negotiated a resolution to our reserve differences with Colorado. Colorado allowed us a three-year phase-in of the difference between what we were not holding and what the Colorado agreement said. The new reserves would be completely phased in by the end of 1996. It also indicated that once GGG was finalized and if GGG had a lower reserve, then we could move to that lower reserve if we wanted to.

We felt that working with the regulators in our state of domicile was a successful strategy. We resolved the major unknown reserve issue, kept ourselves at a good working relationship with our most important regulator, and could get on with business even though GGG was not finalized for about a year after our agreement was struck. This ended phase one of our nightmare. Phase two now begins.

The Colorado agreement only applied to our two-tier annuities, while AG 33 applied to all individual annuities. We were forced to continually explain our Colorado agreement in our actuarial opinions, and I suspect that Colorado may have responded to some questions from other states looking at our reserves.

The nightmare continues! Our AG 33 reserve implementation proceeded as follows. Our initial work on calculating the effect of AG 33 involved going through our entire file of deferred annuities to perform some standard tests. Cash values were tested using Type C valuation rates for annuities with cash values. The annuitization options were valued using Type A valuation rates for annuities without cash values, but with the guaranteed duration definition equal to the years from original issue date to the date of assumed annuitization. We also looked at death benefits using the 1980 the commissioners standard ordinary (CSO) mortality table and the life insurance valuation interest rates.

Testing for all of these was done on a policy-by-policy basis. We did not group policies during our analysis. A time-saving procedure was implemented to try to cut

down on the processing. For the annuitization benefits, we only looked at those durations where the valuation rate suddenly changed in accordance with a change in guaranteed duration. This meant testing at durations 5, 10, and 20 years from issue, and at the maximum maturity date of the policy. We determined that the maximum value would be at one of these points for the annuitization benefits. This process would not work well if credited interest rate guarantees changed between these durations, but such was not the case with my company.

The end result was that we needed to add only a small amount of additional reserves beyond our previously agreed to Colorado numbers, some for our two-tier annuities and another amount for our single-tier plans. While Colorado could not require us to immediately implement AG 33 for our two-tier annuity block because of our previous agreement, we would need to do so for our single-tier annuity. Also, we would need to continue explaining the Colorado agreement to all other states. Therefore, we decided to move to AG 33 for all of our deferred annuities. That was great news for me. However, all was not done yet. Now on to phase three of my nightmare.

My board of directors requested that I grade into the AG 33 increase over the three-year allowable period. This meant entering into more discussions with our domicile state, something that I had enjoyed not having to do for at least a year. We documented our AG 33 analysis, wrote to Colorado, and their first response was unfavorable. However, Colorado did agree to let us phase in the new changes over three years, provided we still abided by the original agreement that we had with them. Since this was not a problem, we proceeded to grade into the AG 33 adjustment on a pro rata basis. The way we have done that is put in 1/36 of the difference between the two reserves at the end of January, 1996, 2/36 at the end of February, etc. We have been doing this month by month during 1996.

The nightmare continues. Now our current phase. As we have been reviewing our calculations and assumptions, we have discovered that the initial work on calculating AG 33 impact may have overlooked some rather subtle issues. Bob and Greg have spoken about some of them. This is one of the real problems with AG 33. There are so many different opportunities for the maximum value to appear and the combinations of events are difficult to think through without some very heavy analysis. CARVM has always had the same principles, of course, but different valuation interest rates and mortality for each benefit stream make it more complex to analyze. This is particularly true for the annuitization options where the valuation rate changes as the assumed annuity date changes. The more complex the product provisions, the more difficult the analysis is.

Guaranteed credited interest rates, which vary by policy duration, may create situations which are not easy to spot. Let me give you examples. We have some options in our policies called life expectancy retirement options or they could be called minimum distribution options. These options, at certain ages, may create a higher reserve value than other benefit streams. This depends on many factors, and it depends on how it is written in any particular policy, but it may include interest guarantees on the settlement option, whether the minimum distributions are treated as withdrawals from the account value or whether they are actually set up as fixed pay annuities, and what the guaranteed credited interest rate is on the account value if that comes into play. Almost certainly, at some attained age, the life expectancy options will overcome the payout annuity reserve benefit stream because of the life expectancy tables in the tax law.

Partial withdrawals are particularly interesting. We found instances where a combination of events such as a partial withdrawal immediately following issue, along with a full surrender a year later, on a first-year bonus interest rate product, creates a higher reserve than any of the other benefit streams. It does assume an interest rate in the first policy year that is higher than the valuation rate. Assuming that the cash value is driving the reserve and that the full surrender charge is applicable on full surrender, which may or may not be common to your policies, that means that there is no partial free outs allowed on the full surrender calculation.

The following calculation would apply ignoring the free-out. If you assume that the first-year interest rate is 8%, but the surrender charge is 9% and that the valuation rate is 5.5%, which is a typical Type C valuation, the calculation for a \$10,000 account value yields \$9,315.64. If you assume that the free-out happened, but with a free-out percentage of 10%, this calculation yields \$9,384.08, slightly higher than the straight cash-value calculation. Each policy has a unique set of assumptions and absolute checking of every possible option will be laborious and time consuming and it may well be impossible for all but the best equipped actuarial departments.

I have one more example. It is the instance where a partial withdrawal takes place at the date of valuation in one policy year, and the full surrender takes place soon thereafter, but in another policy year. This, in essence, gives two free-outs close together, and it has some effect on the reserves. This case assumes that the free-out amount is allowed on the full surrender, which is different than this example.

We believe that some companies may be assuming that a reduction in the surrender charge, because of the effect of the free-out allowed, is sufficient to analyze the effect of free-outs in the reserve process, but the timing of the partials, along with the effect of the relationship between the valuation and guaranteed credited rates,

may cause a higher reserve than otherwise might be expected. We looked at an example where a policy had a relatively standard surrender charge. One free-out was allowed in each policy year, and if that was not taken in that policy year, it would be applied on a full surrender. This example also had the valuation date close to the end of a particular policy year.

Taking a look at the CARVM reserve, the highest value is one assuming full surrender at the beginning of the next policy year with its lower surrender charge. The reserve is, therefore, an accumulation of guaranteed rates of the account value from the valuation date to the next policy anniversary to get the lower surrender charge percentage, multiplied by one minus the multiple of next year's surrender charge and 0.9, to take into account the 10% free-out, and that number was then discounted at the Type C valuation interest rate.

If you look at this example as one where there is an immediate partial withdrawal taken right at the valuation date and then full surrender at the beginning of the next policy year, you come up with a different answer. All is the same as before, with the exception that the accumulation value is the account value excluding the partial surrender right after the valuation, and the value of the free-out is then added to the present value of that. What really happens in this is since the valuation date is close to the next policy year, you are really getting two free-outs, one immediately and one in the next policy year. The present value of these is higher in my example. The interesting thing about this is that the assumed guaranteed credited rate does not need to be higher than the valuation rate for this benefit stream to dominate the calculation, which was a revelation to me.

My department is refining its reserve numbers as we determine gaps in our reserve calculations, just as we have always done. We believe that we have set a mechanism that does a very good job of determining the correct reserve under CARVM and its interpretation as written under AG 33. There is no doubt in my mind that we have not caught all of the problems, and we may never catch every slight nuance of a particular policy.

All in all, AG 33 seems to have been implemented in my company in a reasonably complete manner, with some ongoing work still taking place. For a medium-sized company with a limited actuarial staff, this seems to be an acceptable situation at this point in time. I wish you good luck in your efforts.

Mr. Thomas J. Mitchell: Could you explain how to pick out valuation interest rates. Is there more than one way to do it? What are the issues? If you had a path where something was annuitized in 7 years over a 12-year period certain, and there were

some partial withdrawals and death benefits before then, what kind of interest rates would you use, considering the annuity is a Type C annuity?

Mr. Broer: I saw an outline prepared by the Academy work group and they talked about splitting up the combined benefit streams into their components and using Type A rates for the nonelected parts of the stream and Type C rates for the elected stuff. It looks kind of messy to me, but that is what I saw.

James W. Lamson: I am a member of the AAA Multiple Benefits Work Group. We are working on a white paper right now that is nearing completion and we are also working on wording changes for AG 33. Those should be finalized towards the end of November 1996 and submitted at that time. We hope they will be adopted at the December 1996 meeting. To keep people from being in the lurch a second year on AG 33, we are writing an article that is going to appear in the *Financial Reporter* that should be helpful. Throughout our discussions, we felt it was very important to consider practicality. You can get caught up in all the little details, but when push comes to shove, what we really have to do is provide an adequate reserve. It does not mean that we have to dot every i and cross every t as long as we can show that reserves are adequate.

Another thing that I thought might be of interest is the choice of mortality tables during the deferral period. We are suggesting that the immediate annuity mortality be used for calculating the present value of the death benefits. That is simply because there is no appropriate table that has been developed from deferred annuitant mortality. Mortality and other decrement rates can be used for valuing nonelected benefits, and this includes the present value of all of the parts of the integrated multiple benefit streams. When you are calculating the present value of the elected benefit payouts, you can also discount those at mortality. I think that takes care of Greg's problems with the age-90 annuitant.

We are overhauling the valuation interest rates. That is a very difficult one to try to deal with. We are trying to come up with rates that parallel the current valuation schedule for annuitizations, but that you select the rate in a more conventional manner. The rate will depend on whether you are using issue-year or change-in-fund valuation values, whether or not you have interest guarantees on premiums to be received more than 12 months after issue, and whether you have cash settlement options in your contract. The plan type and the guaranteed duration will be determined based on the benefits you are valuing. In that manner, most nonelected benefits would have a plan type of A, because most contracts would have things like death benefits payable immediately following issue to those policyholders who die.

It has a guaranteed duration of zero and we are recommending the use of a plan Type A for the nonelected benefits.

Ms. Kerry A. Krantz: The previous speaker made one slight mistake with regard to the mortality table. The other thing is this AG 33 is not the current version and could be misleading. I think you mentioned that earlier, but just to be sure, the current version of AG 33 is in the Examiner's handbook put out by the NAIC, and I cannot overemphasize that everyone who wants to rely on AG 33 should rely on the official one and not this one. This one is six months out of date from the final one. As far as the mortality table, in the AG 33, it says that for death benefits, the mortality table used for life insurance shall be used. I would believe that would be the 1980 CSO Table at this point in time.

Mr. LaLonde: I think you are right on AG 33 as it stands right now, but the rewrite should change that.

From the Floor: I cannot speak to the rewrite. I am not on the committee. I can only refer to the guideline that I have been using. The other thing is criticisms of AG 33. I am trying to keep in my mind the difference between AG 33 and the original CARVM. It seems to me that much of the criticism that I have heard was of the original CARVM because of calculating reserves on all these possible contingent things. CARVM has been around for so many years now, it seems that if a company wants to devise exotic annuities that have multiple future payout streams, that they need to write software to be able to calculate reserves according to CARVM, because CARVM is not new.

Companies cannot let themselves be market driven and say we will design the reserve system later. They find out that the reserves are going to be very complicated and cannot be done in a spreadsheet. They may actually have to write a sophisticated computer program on a main frame, or if it is possible, on a personal computer. They need to know that in advance and not just say we cannot do them. If CARVM is bad, if it is really so conservative, then let's address that. We have come into the valuation actuary era where we do cash-flow testing, and if cash-flow testing is the way to prove that your reserves are adequate, let's address it that way. But, as long as CARVM is here, then that is what should be used and it should be used as it was written.

Mr. Lamson: By way of clarification, my prior comments pertain to recommendations by the American Academy's task force. They are in draft format. I am not here in an official capacity at all. For this year-end, it is fairly clear that no changes will be made in time for annual statements, so you do have to use the AG 33 that

exists. Nonetheless, for further support, the forthcoming *Financial Reporter* newsletter should be of some help.

Mr. Charles D. Friedstat: In Tom's example, I think there is something that might be confusing. While it is hard to say that there is a general interpretation of AG 33, I think that if you talk to regulators, practitioners, and people who wrote it, they agree curtate CARVM is the law. In other words, you are looking at the greatest present value of activities that happen on future policy anniversaries, not one second after. That means you could have a somewhat smaller reserve by assuming that partial withdrawals occur on a policy anniversary. There is nothing in AG 33, or the original 1976 valuation law that says you have to go one second after the anniversary. I think you might have been a little conservative by saying we will assume a partial withdrawal here at the valuation date.

Mr. Broer: Yes, you are probably right, but Colorado does not interpret it that way. Colorado has us working on a continuous CARVM basis.

Mr. Michel Perreault: Does AG 33 apply to group contracts with individual certificates?

Mr. Broer: We have a good-sized block like that and wanted to just read the Guideline straight and say group stuff is excluded, but that business is not group business in nature. What we are doing is applying group mortality for valuation purposes, and we're getting decent results.

Mr. Facey: I think group is another subjective. As I recall, there were two original paragraphs in the 1976 valuation law. I believe CARVM does not apply to group insurance that is qualified pension plans. If there are other group coverages that are not pension plans, then CARVM would apply as individual contracts.

From the Floor: I think the group exclusion pertains to things like employer/employee groups and not a group contract certificate situation. We chose a middle course, applying the Guideline, but using group tables for valuation.

The valuation law requires that we use conservative interest rates. The longer the guarantee, the lower the rate. This requires us to hold higher reserves. I think it would be interesting to see if, from any point in time, interest rates really do decrease overtime.

Does anybody on the panel have any feel for how many companies took the tax effect all in one shot versus how many used a ten-year spread?

Mr. Friedstat: Without giving the arguments on both sides of the issue, the rules say that you have to use the interpretation of CARVM that was in place the date the contract was issued. The real issue comes in for policies issues from 1981 to 1994. Is this a new interpretation of CARVM or were all these things embodied in AG 33 really effective at the date the contract was issued. If you say, "No, this is a new interpretation of CARVM," you only apply it to new business going forward. If you think this was the existing interpretation of CARVM, then you are changing your method. You have to take a ten-year spread on the difference beginning the year after you make the change.