VALUATION ACTUARY SYMPOSIUM *

Orlando, Fla.
Sept. 22–23, 2005

Session 21TS
Statutory Financial Reporting for Universal Life

Instructor: JEFFREY A. BECKLEY

Summary: If you are new to financial reporting, need a refresher or simply want to test your understanding of Actuarial Guideline 38, there is nothing better than an example to work through. Prior to the meeting, instructors provided specifications and pricing assumptions for a hypothetical universal life (UL) insurance policy with a secondary guarantee. Participants were encouraged to develop statutory reserves prior to the session. At the session, the instructors presented results and reviewed the actuarial aspects, methods and underlying regulatory guidance.

MR. JEFFREY A. BECKLEY: This is basically a primer on UL reserving. The intent is to go through the entire process of reserving for UL products on a statutory basis. We're going to cover AG 38 and its application, but, as I said, this is intended to be a primer to a large extent.

The Society sent out a package to everyone who signed up for this session that included a description of a UL product. After today's session, I will e-mail the spreadsheet we're going to walk through to the participants. We're going to quickly review the UL product that I sent out. We're going to talk about statutory reserving process, and then we're going to talk a little bit about the proposed change, which has mostly worked its way through the NAIC, but hasn't quite gotten the final approval, with regard to AG 38.

We're going to actually go through and calculate reserves in detail for this product. The product is a fairly standard product. It has a $12.50 per month load. It has a guaranteed interest rate of 4 percent. It's a 2001 CSO product, and the current costs of insurance (COIs) are reverse select and ultimate COIs. With the COIs, the first 20 years are 90 percent of the guaranteeds, and then for years 21 and after they are 50 percent.

The product does have a secondary guarantee. It is shadow-account–based. With

the shadow account, you accumulate the net premiums, less the accumulated guaranteed death benefit (GDB) costs or charges. There's no premium load on the premiums up to 120 percent of the GDB charges, and there's an 80 percent load on premiums in excess of that. We'll talk about why that structure is that way when we get to the reserves.

If you're familiar with products that are in the market, this peculiar type of loading structure is not uncommon out there. The GDB charges are the current COIs times the specified amount, not the net amount at risk. Finally, the shadow account pays 10 percent interest, and that 10 percent is guaranteed in every year going forward.

The reserve basis we're going to use is a 2001 CSO male. We're doing a male age, but it's 2001 CSO smoker or non-smoker. Interest rates are 4.5 percent. We're going to look at a male aged 35, and we're going to use valuation data from the end of 2004. In the information that I sent out, there are three policies. We have a 35-year-old, issued on January 1, so it's exactly one year old—convenient for the purposes of this exercise.

The second policy is exactly the same, except the in the first policy they pay in the target premium and they have an account value of $582. In the last one, they've obviously dumped money in, so they have substantially more money in the account value. We will not discuss the third policy today, but the main difference there is the date, which is one and a half years in.

There are effectively three pieces of legislation that impact UL reserves. The first one is the UL Model Reg. In reality, the UL Model Reg has been adopted by very few states, but through codification and industry practice it has essentially been universally adopted. The second piece is the valuation of life insurance policies, which is also known as XXX. Finally, there's AG 38, AXXX, which is intended to interpret the valuation of life insurance policies for UL products. Some people would say that it goes well beyond interpreting it. Reading through what AXXX requires you to do, I don't think there is anyone who would have gotten that out of reading the valuation of life insurance policies, but that's where we are. That's what we have.

The guidance in AG 38 basically says that you calculate the reserves required under the UL Model Reg, and you calculate the reserves required under the combination of AG 38 and the valuation of life insurance policies, you hold the greater of the two reserves. We're going to walk through what the UL Model Reg says, and then we're going to do it for our sample product. Then we're going to walk through what the valuation of life insurance policies as interpreted by AG 38 says, and we'll do it for our product.

For the UL Model Reg, you start by calculating a guaranteed maturity premium (GMP). This is calculated at issue, so once the policy is issued, unless you have a policy change of some sort, it is fixed. It's the level premium that will mature the

policy for the specified amount. In other words, if you have a $100,000 specified amount policy, it's the premium that you have to pay every year so that the maturity value when your policy matures is $100,000. It's based on the guarantees in the contract: guaranteed mortality, guaranteed interest and guaranteed expense charges.

From this, you then calculate a guaranteed maturity fund (GMF). The GMF is the projected fund value assuming the guarantees in the contract and assuming that the GMP is paid. Once again, this is calculated at issue, and it doesn't change unless you have some sort of a change to the policy, such as a face amount increase or something.

Those first two items that we talked about are calculated as of the date the policy is issued. When you actually get to the valuation date, you first project the account value forward to the maturity date. You start on the valuation date and use the greater of the GMF or the account value. In other words, if this GMF that you calculated at issue is greater than the account value, you use that to project your future benefits. If the account value is actually larger, then you use that to project your future benefits. You always assume that the GMP is paid, regardless of whether you start with a GMF or the account value.

The purpose of doing this projection is to determine what the death benefits will be and what the maturity value will be under this scenario. Since there's a corridor in there, if your account value is higher than the GMF, your cash value usually is going to build up when the GMP is paid. You're going to get a death benefit that, in the older ages, is going to be substantially more than your starting specified amount, because the corridor kicks in.

Usually, though not always, it depends on the mechanics of the product. Usually, if you start with the GMF, the corridor doesn't kick in. Sometimes it will; it just depends on how the product is structured. The other thing that you get is your maturity benefit. In our product, we're going out to age 120, the end of the mortality table. It's assumed everybody dies by that point in time. The maturity benefit doesn't come into play. But if you're using the 2001 CSO, one of the things that you will see in the marketplace is some companies are endowing those at age 100. Part of the reason is that the IRS guidance on UL contracts and when they have to mature isn't exactly clear, so some people feel like they have to endow at 100. In that case, not everybody is dead, so the maturity benefit would get paid to those that are living at age 100. But for our purposes, the maturity benefit doesn't really come into play.

Finally, the reserve is defined as the R factor times the present value of future benefits, minus the present value of the net level premium, minus the unamortized expense allowance. The R factor is the ratio of the account value divided by the GMF. It's capped at one. So if the account value is larger than the GMF, your R factor is one. If it's smaller, it's whatever that ratio is. One way to think about that

is that it's a measure of the level of funding in the contract. When you calculate your GMF, you're more or less assuming that it's a whole life or an endowment to a certain age. If you're funding at this point, your account value is less than the GMF. You can think of it as being funded less highly than anticipated, and if it's greater, it caps it at one. The R factor is that ratio, which gets multiplied by the present value benefits minus the present value net premiums minus the unamortized expense allowance.

For those of you who remember your life contingencies, if you combine these two, it gets you to your beta instead of the net level premium. That's not how the formula is defined, but that's the effect of it. The present value of future benefits is calculated using the projected benefits that you just went through when you projected your account value out. So, if when you project out your account value you get a higher death benefit in the later years, those are the death benefits that you use to calculate your present value of future benefits. That's also calculated at your valuation basis. In our case, that would be the 2001 CSO with 4.5 percent interest.

The last two items are the net level premium and unamortized expense allowance. Those are actually, once again, calculated at issue, based on the plan guaranteed by the GMPs. Those will effectively only change if, once again, you have some sort of product change.

Finally, within the UL Model Reg, there's something defined as the alternative minimum reserve (AMR), which you can think of as a deficiency reserve. As a matter of fact, it's probably exactly the deficiency reserve, but if the GMP is less than the valuation net premium, then you have to calculate the AMR. If your GMP, in other words, the premium required to endow the contract based on the guarantees, is greater than the net premium, you don't have to make an AMR calculation. But if it's less than that, that means the guarantees in your contract, for whatever reason, result in a premium that will mature at less than the net premium. At that point, you have to make another calculation, and your reserve becomes the greater of the above calculated reserves or the reserve calculated using that methodology but using the minimum standards for mortality and interest and replacing the valuation net premiums with the GMPs. In our product, for example, if we found that it was deficient, even though we're valuing it using the 2001 CSO ultimate table, for the purposes of this calculation, we can use the select and ultimate table if that provided us with relief.

Now before we go on to the impact of AG 38 and the valuation of life insurance policies, let's look at these calculations for our sample policy. In calculating reserves, the first thing that you have to do is calculate the GMP. The GMP is the level premium that can be paid to mature the policy. If we look at my account value at age 120, it's $100,000, which is what it should be because I have a specified amount of $100,000. So my GMP paid every year results in the $100,000 value at the end. One of the things in my description of my contract was that I did not

permit premiums after age 100, so my GMP actually cuts off its calculation. The last GMP is paid at 99, and then after that there aren't any.

If you've used Excel a lot, you may be aware of a function in the "Tools" that you can install called the "Solver." It's very useful for doing something like this. You can target the very last cell in that fund value calculation. You could make it a value of $100,000 and you could put in here the cell that you want to change, and it will solve for that premium. The Solver can help you do this sort of thing a lot. You may say you're not going to build valuations, so you don't have to do this, but you may end up checking a valuation system or something, and this will save you a lot of time. In addition, it doesn't limit your decimal places. I got exactly $100,000 out at the end. You know that a change of even a three to a two might have made it $120,000. It's amazing what happens with compound interest. But this actually gets you to a number to a billion decimal places, and gets you what you want.

FROM THE FLOOR: That's one issue that I've actually run into. I think you run into it more with 2001 CSO—fractions of a cent on your GMP just blow up by age 121. I'm just wondering if you know what companies do in practice when they're programming their systems. You really can't round your GMP to the nearest penny, or it won't necessarily produce a GMF that matures the contract. Do you know what companies do to deal with that issue?

MR. BECKLEY: I can't say that I do. I've seen systems that round to highest end, and I've seen systems that round to lowest end. I don't know that there is a practice out there.

FROM THE AUDIENCE: But it sounds like it's okay—you've rounded your GMP to the nearest penny—and then you're using what GMFs? Now you have a GMF as you're getting out past age 110 that's not going to get anywhere near your specified amount.

MR. BECKLEY: It would be interesting if someone from one of the major software programs, like Arc Val or PolySystems, were here to tell us what they do. I don't really know what their systems do. With an early duration like this one, it doesn't make a lot of difference, but as your policy gets older, it certainly does make a huge difference.

Once we have our GMP, we eventually get to our GMF, which, as I showed earlier, at age 120, because I solved for a GMP to many decimal places, is actually $100,000. So we average GMFs. The next step in the process is to calculate our present value of benefits, calculated as of the date of issue, and the present value of our GMPs, also calculated as of the date of issue. I'm using this pattern more than anything else to show that if you divide that by the GMP, you get an annuity of one, what the present value of that is.

The net level premium is the present value of benefits divided by the present value

of the gross premium divided by the GMP. In other words, the last two items will be in parentheses. This is basically alpha and beta. This is the present value of benefits divided by the present value of a unitary premium, at the end of the first year. Alpha is the COI for the first year, so the difference between those two is my unamortized expense allowance, which is $823.85.

All of these formulas are basically recursive formulas working from the bottom up. They're from first principles. There are annual premiums, but I'm calculating them as monthly unamortized expense allowance. At issue, the premium is paid. The unamortized expense allowance drops, and then it grows back up to $817 and then it drops. In reality, I probably shouldn't discuss anything except the year-end numbers. When you work through a recursive formula like this, this is what happens. My experience is that most companies calculate it at each year-end, and do a linear interpolation of some sort between those year-ends. The formula is all worked out this way, and everything is amortized. I would have to say my experience has been that industry practice would interpolate between those two, as opposed to that somewhat strange pattern with those drops.

All of that can be done at issue. It can be stored and recalculated on the fly at that time. But we get to the end of the first year, and our actual fund value is $582.91. So that means that our R factor, which, if you remember, is the fund value divided by the GMF, is $582 divided by the $902, which is 0.6462. So that's our R factor. The next thing that we do is go to the reprojection. At the end of the first year, we start and we project forward. If you remember, if the GMF is greater than the actual account value, we start with the GMF and we project forward. So in this case, we start with the GMF, because the account value is less, we project forward, and because we're starting with the GMF, we just have a level $100,000 all the way out, which is what you would expect.

That projection is the source of my projected death benefits. I have my valuation queue and my interest rate, and I can calculate the present value of those benefits, which is about $17,800. It probably shouldn't surprise you that I get a reserve of zero. If it's Commissioners Reserve Valuation Method (CRVM) at the end of the first year, what would you expect to get if there's nothing weird going on? You would get zero. So this number is the present value of benefits minus the present value of the net premiums of present value of future net premiums of $887.64, minus the unamortized expense allowance, and that comes out to be exactly zero.

There's one final step that you have to do here: you have to compare it to the cash surrender value. It would end at the end of the premium period. In this case, even though my product goes to 120, my expense allowance is zero beginning at age 100 or 99.

The last step in this process is if the cash surrender value is larger than the reserve, then your final reserve would be your cash surrender value. But in this case, it's not. If you remember, our account value is $582; our surrender charge is

approximately $1,650. When you subtract the two, you get a negative number below zero.

This is the second product. If you remember, the only difference between the first product and the second product was the second product had a dump-in. So it had $15,000 account value. For the reserves for that product, you end up with exactly the same GMP. But now when we calculate our values, we have an account value of $15,400. You divide that by our GMF of approximately $9 something, and we get one, because it's capped at one. So our maximum value there is one.

When we project out the death benefits, by the time you're 120, because the account value explodes and the GMP continues to be paid, you end up with around $900,000 death benefit at age 120. If you look backward, it's somewhere around age 60 where it starts to go up, so it has a significant impact on your present value of future benefits, which is now $29,000 instead of $17,000. That results in a reserve of $11,400, which is before comparison to the cash surrender value. If your surrender value is equal to the account value minus the surrender charges ($1,650), we would have a surrender value of $13,000. Our final reserve would actually be the $13,000, because it would be higher than the reserve that's being calculated through the UL Model Reg. These are terminal reserves, not means.

The other thing that you will note is that from an AMR standpoint, we have a GMP of $1,120, and we have a net premium of $887. There's no deficiency, so we don't have to calculate an AMR. If the GMP were less than this, then we would have to go through the AMR calculation.

There are ambiguities. Everything is not really clear. An industry practice, I would say, is not consistent across different companies. And most of the ambiguities have to do with mid-year stuff. You notice I conveniently picked something that is exactly one year old because it made it easy for me. I'm allowed to do that; it's a teaching session. But for the R factor in the middle of the year, do you use the nearest month of your GMF or do you just calculate annual GMFs and interpolate? Or do you just calculate terminal reserves and then what do you do for mid-year reserves? Do you use mean reserves? There's a whole realm of practice out there, and I don't think anything is wrong. For an individual policy, you might get something that's reasonably significantly different. But if you take a whole block of policies, unless your policies are all issued on January 1 or some date because of your unique market niche, it doesn't really matter. You end up with approximately the same level of reserves. However, you do need to be consistent. For mid-year reserves, some companies do exact calculations; others do a mean reserve. It is possible, even though this is a flexible premium product, that in calculating mean reserves, you may need to adjust for deferred premiums. It really comes down to the assumptions that you have in calculating your GMFs and GMPs.

There's a very good discussion of it in Tullis & Polkinghorn, a book that's been around forever that I think is one of the great books that the Society has published.

It's called something like "Valuation of Life Insurance Liabilities." If you want to be sure that you're doing it right or if you want to know for sure the right method, they go through and talk about the different combinations and whether or not you should have to adjust for deferred premium.

That is the end of the UL Model Reg. Now let's talk about the valuation of life insurance policies and its interpretation by AG 38. This really applies to UL contracts with a secondary guarantee. If there is no secondary guarantee, I believe it's a fair statement to say that you don't have to worry about the valuation of life insurance policies. It's only if you have a secondary guarantee. But it's any sort of secondary guarantee. We are dealing with a shadow account product, because it raises a few more nuances and issues. But if you have a premium-based guarantee, you still have to apply the valuation of life insurance. If you have a guarantee that says, if you pay at least $1,000 every year, the policy is going to guarantee to mature no matter what happens, you have a secondary guarantee and you have to go through the AG 38 calculations.

We have a shadow account, so as I said, it adds some nuances to what you do. There are nine steps laid out in Section 8 of AG 38, which is intended to interpret the valuation of life insurance policies. For the first step, you determine the minimum gross premiums that will maintain the secondary guarantee. This is determined at issue, and this really refers back to Section 7.A.(4) of the valuation of life insurance policies. To calculate those minimum gross premiums, you assume that your, in our case, shadow account is zero at the start of the year; you determine the premium that has to be paid, so it will be zero at the end of the year. Then you go to the next year and you do the same thing. So it's the minimum premium that you have to pay in each year, assuming that you have no excess premium paid or assuming your shadow fund is zero to get to a shadow fund of zero at the end of that year. We're going to go through and do that, but that's basically how you determine the minimum gross premiums based on the secondary guarantee requirements. In other words, it would be based on our shadow account, not our general account or whatever you want to call it.

It depends on how your guarantee is structured, but in our case, it will give us annual renewable term (ART) premiums. That is advantageous because it definitely helps minimize the reserves.

In step two, you use the minimum premiums that we just calculated, and you calculate the basic reserves and the deficiency reserves under those sections of the valuation of life insurance policies. The specified premiums are the minimum premiums that we just calculated. You then go through and look at those minimum premiums and use those to determine your segments. Under the segmented method, you don't calculate for ULs, you don't have to calculate a unitary reserve. You just calculate the segmented reserves. So you use these premiums to determine your segments, and then using those segments, you calculate your basic reserves, and you calculate your deficiency reserves. Under the deficiency reserves,

you can use the X factors; you can use select and ultimate mortality as opposed to ultimate, even though we are using ultimate for Part B for our basic reserves.

Those first two steps are pretty much confirmation of what the valuation of life insurance policies is saying. I would say that before AG 38 came out, this is what most people probably were doing. I'm sure there were some people who interpreted it differently, but this is pretty straightforward from the valuation of life insurance policies. As I said earlier, once you go beyond that, most people would say this is breaking new ground and that you couldn't have interpreted this from the valuation of life insurance policies. But AG 38 lays this out now as what is to be done.

In step three, you determine the amount of actual premiums paid in excess of the minimum gross premiums. It goes on to say that if you have a shadow account, it is the amount in the shadow account. In our case, we have a shadow account, so the amount in the shadow account at the end of the first year will be the amount that we get for step three.

Then you calculate the single payment that would fully fund the secondary guarantee at the valuation date, assuming the shadow account is zero at that time. You assume that the minimum premiums have been paid to date, which, if they're calculated correctly, should give you a shadow account of zero at that point in time.

So you calculate the single payment that will fully fund the secondary guarantee, and you divide that amount that you got in step three, which buys the single payment. In other words, you're taking the ratio, which you can think of as the amount of funding in the shadow account that exceeds the minimum funding, and you're dividing it by the maximum funding you would need right then at that point in time to totally guarantee the contract.

If you remember, in our premium structure there's no load on the premium for the first 120 percent of the GDB charge, and there's an 80 percent load on premium over that. So what is that going to do to our single payment at that point in time? It's going to make it very large. Why do you want that? Because that's going to help minimize reserves. So when you see a product out there with a shadow account that has weird loads on it, that are like 50 or 80 percent, it is a little extreme, but I've seen products that are that bad. The reason is that it maximizes this single payment, and if someone prepays on a shadow account, it helps minimize the reserves that you have to hold under this provision.

In step five, we calculate the net single premium on the valuation date, and this is just exactly what it says, it's a net single premium. It's based on the coverage guaranteed by the secondary guarantee, and it uses any table or select factors authorized. Since it's a net single premium, you don't have to worry about the slope in the mortality table creating reserves that you would think an ultimate table will always give you higher reserves or a higher net single premium than a select and ultimate. You probably always want to use a select and ultimate table here,

because once again, it's advantageous to minimize the net single premium.

In step six, you calculate the net amount of additional premiums. You take the ratio that you calculated in step four, which is the amount in the shadow account, divided by your single premium to pay up the shadow account, and you multiply that times the difference between the net single premium and the reserves that you already calculated. The net single premium is like the net single premium that you would need to fully fund the future benefits, minus the reserve you're already holding. It's the difference between those two, and you multiply it by the ratio that you calculated in step four, which is supposed to measure how much of the shadow account or the secondary guarantee you've already funded.

Then you go through some other steps. I wasn't a party to the development of AG 38, but my guess is that the purpose of most of the rest of these steps is to reallocate the reserve between deficiency reserves and basic reserves, because basic reserves are tax-deductible and deficiency reserves aren't. So you're going to calculate a reduced deficiency reserve, which is the deficiency reserve you already calculated, times one minus the ratio from step four. That's floored at zero. If you have a positive deficiency reserve and you multiple it by a ratio, by one minus a ratio that's less than one, then how can it ever be less than zero? That's specifically addressed in the Code.

In step eight you calculate an intermediate reserve, which is the net amount of additional premiums that we got from step six, plus the basic and deficiency reserves from step two, which cannot be larger than the net single premium. That's an intermediate reserve, and from that we subtract this thing called the applicable surrender charge, which I'll talk about in just a minute. That becomes our actual reserve. We compare that to the reserve that we got from step two, which is the basic reserve and the deficiency reserve out of the valuation of life insurance policies. If it's less, then we stop and use what we already have. If it's greater, then we go through and finish up this reallocation of our reserve between deficiencies and basic reserve, and we're done. But if it's greater than what we initially calculated in step two, this actual reserve is the total amount of the reserve that gets held. The rest of it is how it's allocated between deficiency reserve and basic reserve.

If you're really a novice at this, or haven't spent a lot of time with this, and you've followed exactly what I've done, I give you credit. It's complicated and confusing, and we are going to walk through it with the actual policy, but I think this is hard to follow no matter what your experience. Let's go back for just a second and talk about this applicable surrender charge, because to calculate your actual reserve, you subtract the applicable surrender charge from this intermediate reserve.

The applicable surrender charge is what you can think of as an effective surrender charge. If you have an account value of $580 like we do in policy one but you have a surrender charge of $1,600, if someone surrenders you don't really get $1,600.

You get $580 because they get zero. You don't charge them for something. The applicable surrender charge is the actual account value less the surrender charge or less the surrender value, and it can be less. So if you have $580 account value, and a $1,600 surrender charge, your applicable surrender charge is really just $580, because that's all you're going to get if they surrender at that point in time. So that's what gets subtracted in the calculation of the actual reserve.

For step nine, you calculate this increased basic reserve, which is really the actual reserve minus the reduced deficiency that you calculated back in step seven. This is really just a reallocation of the reserve between these two pieces. I'm sure there is some theoretical basis for it, but it looks an awful lot to me like it's tax-driven.

If this reserve is greater than the reserve under the UL Model Law, then that is the reserve that you have to hold. There are a lot of steps. It's very confusing. It's very complicated, and as I said, it seems to go well beyond what you would have gotten out of the valuation of life insurance policies. But let's look at the actual application of it to our contract.

The first step is to calculate the minimum premiums to guarantee that the shadow account will stay in place. But this is the premium that, if the shadow account starts at zero, is going to result in a shadow account of zero at the end. The next year you have to pay $99.11 and you would end up with a zero shadow account, and it just keeps going. Under our design, you end up with ART premiums, which go up every year. Why is that advantageous?

The second step is to calculate basic and guaranteed reserves. To do that, we calculate the ratios that are defined in the valuation of life insurance. Basically, G of T is the ratio of the minimum premium from one year to the next, so this is like the $99.11 divided by the $93 or whatever in the first year. This is our ratio of our valuation mortality rates. You will notice that I've set this up so those are equal. And why is that advantageous?

It actually helps you minimize reserves if you can say that this whole thing is one segment. If you remember, whenever G of T is greater than R of T, you have to start a new segment. There is also a 1 percent tolerance, where you don't have to start a segment if this is greater but it's not greater by more than 1 percent and whether that's multiplicative or additive. I don't know if there is definitive guidance on that. But I've set it up so they're exactly equal. I've set it up so we have one segment for the first 20 years and then there is a second segment that begins in the 21st year. We have select and ultimate or reverse select and ultimate COIs, which are 90 percent of the valuation table the first 20 years and 50 percent after that. Then I defined my GDB charges to be a function of those. So, in that 20th year to 21st year, my ratio drops and I do have a new segment started.

Then I'm calculating my basic reserves, my present value of benefits, my present value of premiums, my net premium to gross premium ratio, and I end up

calculating my basic reserve, which at the end of the first year is zero. Once again, you would expect that under CRVM. I haven't done a wonderful job of designing this product, because I do end up with some basic reserves. If you actually get one segment, I believe that you can set it up so that, because it's one segment and the premiums are ART premiums, exactly following the mortality table, you can actually end up with zero reserves in your basic reserve pattern all the way out.

That's the first part of step two. The second part, if you remember, is to calculate the deficiency reserves. In calculating deficiency reserves, I'm going to bring in my select mortality, and I'm going to calculate an X factor. Select mortality times my X factor gives me my deficiency mortality. This is my expected mortality from pricing. To test to see if my X factor is okay, I tested present value of the deficiency mortality versus present value of the experience mortality. My ratio eventually gets down close to one. That's how I picked 58 as the minimum X factor that I could have.

I calculate my present value of benefits, and you will note that that's different than the present value of benefits that I had before. The reason is that I am using my mortality based on my X factors and my select and ultimate. I get a much smaller present value of benefits. My deficiency reserve becomes the present value of benefits, minus the present value of the net premiums or the present value of the gross premiums. The way it's defined in XXX is you subtract off any basic reserve that you got. In this case it's zero, so that last subtraction doesn't affect it. But I end up with a deficiency reserve, which should make sense, given the level of the guarantee that's in the shadow account.

A well-developed product following this process probably could eliminate that. To be honest with you, I included some issues here to make a point, but I didn't intentionally try to absolutely minimize reserves using AG 38. At the end we're going to talk about a little more about AG 38. But you can see that through creative product design (whether it's appropriate or not is another issue), you can do a lot of things to minimize reserves under AG 38.

In step three, you calculate the actual premiums in excess, and this is the amount in our shadow account. If I go back to my shadow account calculation, when I pay $800 in the first year, which is the assumption, I get $176.26, which is what my shadow account is. Under AG 38, that is defined to be my excess premium. That's step three.

Next I have to calculate the single premium to find the secondary guarantee is. I used the solver to solve for the premium that would make the shadow account equal to zero at 120. That's the premium that I need to guarantee it to 120. This doesn't have to be $100,000; it has to be zero at that point. So that gives me $20,563 as my single premium. It's so large because I have this 80 percent load on excess premium. If you remember, at this point in time, my GDB charge was $99.11. The structure is set up so that $120 comes in with no load. The rest of the

premium that comes in is hit with an 80 percent load. So approximately 80 percent of this number is a load, and why did I do that? As I said, it's advantageous to blow that up, because it helps you minimize reserves. We can talk about whether it's appropriate a little later, and that's why there's been so much controversy around AG 38.

In the next step, we calculate this ratio, which is less than 1 percent. That's step four; that's our ratio.

For step five, we calculate the net single premium. It's exactly what you think. It's the present value of $100,000 based on the valuation, interest rate and mortality. This is our net amount of additional premium—$120. That is our net additional premium that's been paid.

Then we calculate our reduced deficiency reserve, which is step seven. That reduced deficiency reserve is a deficiency reserve that we got before of $3,440 times one minus this ratio. So it's approximately 99 percent of what we had before. That's the actual reserve before the reduction. That's the intermediate reserve. Remember our account value is $582. Our effective surrender charge can't be larger than the account value, so in this case, it's equal to that. That gets us a reserve after the reduction of $3,000, and then step eight asks, is this reserve and this is going to be our total reserve, is that less than the reserve that we calculated back in step two? Well, in step two, we had a zero basic and we had $3,400 deficiency reserve, so that's larger than what we're getting here out of XXX. The answer is yes, so we don't really have to calculate that.

If we look at the other product, we end up with exactly the same thing for the first couple of steps. We end up with exactly the same premiums. We end up with a basic reserve of zero, and we end up with the same deficiency reserve. But this time the amount that's in our shadow account is a lot larger because they've paid in additional premium. Our single premium to fund the secondary guarantee assumes that we start with zero, so it's exactly the same as what we had before. But our ratio is now 16 percent. Our net single premium is the same. Our amount of additional premium is this times one minus the ratio, so it's $2,255. A reduced deficiency reserve is the $3,440, times one minus this, which gives us this reduced deficiency reserve.

We take off the effective surrender chargefrom our actual reserve. In this case, since we have a $15,000 account value, if someone surrenders, we get the whole surrender charge, so our effective surrender charge is the full surrender charge. Our actual reserve after reduction for the surrender charge is $4,045, less than step two, and we then have an increased basic reserve. Before under step two, we had no basic reserve; now we have $1,500. We had $3,440 as our deficiency reserve; now we have $2,900. In the aggregate, the total is $4,000. So we have a higher number than we got under the first two steps. But, if you remember, under the UL Model Reg, we ended up with a reserve of $13,000, which was a cash

surrender value, so that's going to be the ruling reserve anyway.

I suppose it would have been instructive if I had come up with an example where AG 38 actually ruled. But because of some of the things that I did, like the 80 percent loads and the creating of only two segments, it minimizes the AG 38 reserves and they will never come into play on this product.

As most of you know, there's been a lot of controversy around AG 38 over the last year or so. The whole introduction paragraph in AG 38 says, "Obviously new designs will emerge. No statute, regulation or guideline can anticipate future product designs and common sense and professional responsibility are needed to assure compliance with both the letter and the spirit of the law. While the model is a complex regulation, its intent is clear. Reserves need to be established for the guarantees provided in the policy. Policy designs which are created to simply to disguise those guarantees, or exploit a perceived loophole, must be reserved in a manner similar to more typical designs, with similar guarantees."

There are a lot of designs that have appeared in the marketplace, where some people would say they're taking advantage of perceived guarantees or perceived loopholes, or if they're exactly calculating reserves through this nine-step process, they're not following the spirit of the law. Other actuaries would argue they laid out a specific procedure and statutory reserves are redundant. I'm just doing what they're telling me. I'm not doing anything wrong. How do I know what the spirit of the law was?

But there's been a lot of discussion in the industry. Regulators have been involved, as well as the Life and Health Actuarial Task Force (LHATF). In the end, we (we being the industry, I guess, and when I say we, I include regulators) arrived at a compromise that was developed by a group of CEOs, which basically limits the loads in step four. This revised guideline has been passed by LHATF and has been passed by the A Committee. It has not officially been blessed by the executive committee or the plenary committee, but there's no reason to expect that it won't be. And it would have probably already been blessed, if the catastrophe in New Orleans had not occurred.

So I think everyone's expectation is that it will become the regulation. It has an effective date of July 1 of this year. Assuming it's adopted, it applies to any policies issued after July 1. It also has a sunset date. I think it's August 1, 2007. So the regulation says that, from July 1 of this year to August 1, 2007, you're going to follow a different procedure. Basically, it's the exact same thing that's laid out here, except in step four, if you remember, you calculated, assuming you had a zero account shadow fund, the premium that was necessary to provide the guarantee to the end. Now what it requires that you determine the amount that has to be in the shadow fund at that point in time and divide it by 0.93. In other words, the equivalent would be, under the old system, to calculate the premium that's necessary and assume there's a 7 percent load on that premium.

There was also some more language about how approaches should be modified to comply with the intent. There are other ways to structure products besides just funky premium loads or extremely high premium loads to minimize reserves, and I'm not sure that there aren't going to be creative product designs that still minimize reserves under the revised AG 38. As a matter of fact, I'd be shocked if there weren't. But anyway, the change being made to AG 38 is basically to say that the premium load in step four is 7 percent. Now the language is a little different. It says to determine the amount that has to be in the shadow fund at that point in time to provide all the guarantees, divided by 1 minus 0.07 or divided by 0.93.

What impact does that have on reserves? If you have a product like this, which has extremely high loads, obviously it substantially reduces that single premium that you calculate. If you have excess funding, it's much more likely to result in reserves being required under AG 38 than would have been under the old AG 38.

The reason that there is a sunset in it, at least in my understanding, is that it's to be a motivation for all of us to develop a long-term solution instead of a short-term solution, which is what this is supposed to be—a short-term compromise between the different factions within the industry and the regulators as far as how to handle UL reserves with secondary guarantees.

I'm not sure I qualify myself as a tax expert, but most tax experts would say that if, for example, you were using select and ultimate mortality in your base reserve calculations, you'd still use ultimate mortality in your tax reserves, because the position of the American Council of Life Insurers (ACLI), I believe, accepted by the IRS, is that you always use the ultimate table, not the select and ultimate table. But you would basically go through the same process, using the tax interest rate and the tax mortality table, if it was different. And you would just hold the basic reserve or the UL Model Reg reserve, if it's greater. The limit of your tax reserve can't exceed your statutory, and it's going to be at least equal to your surrender value.