1997 VALUATION ACTUARY SYMPOSIUM PROCEEDINGS

SESSION 2

Life and Annuity Valuation Issues

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LIFE AND ANNUITY VALUATION ISSUES

MR. JAMES W. LAMSON: We will have three speakers. The first in order of appearance will be Lou Pirog, who is the appointed actuary for Aetna's Annuity Company. Lou's responsibilities include reserve and capital adequacy, asset/liability management, and pricing policy. He has served as a member of the Academy's task forces on risk-based capital, Asset Valuation Reserve (AVR), and Interest Maintenance Reserve (IMR), and valuation. Lou will provide us with a status report on the Valuation Law Task Force.

Our second speaker will be Edwin Reoliquio who is senior vice president and chief actuary at Sun America, Incorporated, where he manages the actuarial department and is responsible for valuation, financial reporting, and asset and liability management. He also performs appraisals and conversion of mergers and acquisitions and oversees implementation of new products in administrative systems. Edwin will give us a status report on the progress that has been made by the Academy's Equity-Indexed Products Task Force.

Finally, I will handle the other topics of this session which principally surround three annuity valuation topics, Actuarial Guideline 33 changes, Actuarial Guideline MMM, and the new Annuity Valuation Mortality Tables. I'm managing principal of the Kansas City Office of Actuarial Resources. I function as appointed actuary, on a consulting basis, and am heavily involved in our valuation system as well. Let's get started with Lou's presentation.

MR. LOUIS M. PIROG: I'm going to start off and talk about what's going on with the NAIC Valuation Task Force. If some of this sounds familiar it's probably not *déjà vu*. It's probably just a restatement of what Bob Wilcox stated at Session 1. I'm going to give you some background on why the project was initiated, what its goals are, and what has happened to date. Obviously, a project to review and revise a valuation is about as big a project as you can get. I've heard some people refer to it as the valuation 2000 project. Let me just say that I think the 2000 part is not

supposed to refer to when the task force is going to produce something, but rather refers to a new approach to doing valuations in the next century.

A good place to start is why change the system? Why is this project needed? The current system has been around for a long time. It has worked well most of the time. Much of the problem that we have with it is that many of the products that are out there were not anticipated when the current structure was developed.

At that time, insurance companies basically all looked alike. They sold the same products. They owned the same assets. Holding net level premium reserves was considered a sign of strength. Since then, we've basically seen a variety of new and exotic products sort of come into the fold: universal life, guaranteed investment contracts (GICs), single premium deferred annuities (SPDAs), and equity-indexed annuities. Things have certainly been just as innovative, if not more, on the asset side.

The standard regulatory response to date to new products and securities has been to modify existing laws and regulations, adding an actuarial guideline here and there as needed. In essence, what we're talking about is sort of patching the roof. Each time it leaks, we put a new patch on it, and I think what we've kind of ended up with is something that would probably make Rube Goldberg proud. At this time I think we're looking at the need for a new roof. We must shift the paradigm that we've used in valuation.

Some of the specific areas of weakness include the focus on the liability side of the current system. You have a New York Regulation 126. You have the Actuarial Opinion and Memorandum that recognizes supporting assets with the addition of cash-flow testing. However, that recognition is really more of an add-on to the system than being an integrated part of it. As was indicated earlier by Bob, you can't lower your reserves below the statutory minimums anyway, so it's really only being used part of the time.

The focus of the current system really is kind of narrow in scope. It provides regulators with information, but the needs of other constituents like management, policyholders, and investors, to name a few, are basically ignored.

The current system looks at a company in a piecemeal fashion. It doesn't really address the entire enterprise. It doesn't look at the long-term viability of a company, something that, obviously, the management is greatly interested in. The structure is rigid, making it difficult to develop new products, to be innovative. Certainly that capability is going to be needed more in the future as insurance companies seek to attract capital in a field with an increasing number of nontraditional competitors. Finally, there's the issue of variations by state. There's no single set of standards across all the states and that, obviously, creates a significant administrative burden.

Recognizing the need to address the increasing complexity of valuation, the NAIC initiated this project to review the current valuation system and gave the following charge to the American Academy: "Request that the American Academy of Actuaries initiate a thorough study regarding current valuation methodologies applicable to life insurance, annuities, and health insurance, and make recommendations as to changes which should be implemented." The NAIC also requested that the Academy provide reports on no less than a quarterly basis with an interim progress report due at this year's winter national meeting.

The Academy's first response was to get Bob Wilcox to be in charge of it. Bob, being a former regulator, has had experience on both sides of the fence. In the response, the Academy stated, "The American Academy of Actuaries will initiate a thorough study regarding current valuation methodologies applicable to life insurance, annuity, and health insurance, as well as the legal and regulatory mechanisms through which they are implemented and make recommendations as to changes which should be implemented."

The study will begin by addressing the broad objectives of a revised valuation system and will not be constrained by past valuation practices. The study will consider the impact on other elements of

the regulatory framework and it will provide reports on a quarterly basis, preparing an interim report for the 1997 national meeting, identifying the fundamental concepts on which any recommendations would be developed. It's quite an undertaking.

So what is the project plan? The first phase is a year-long study of current valuation systems. The goal will be to describe the ideal valuation system, basically, to set a benchmark. To accomplish this, the task force is starting with a blank piece of paper. There won't be any baggage from the historical valuation practices. The intent is not to be tied to any of the existing considerations. Finally, an interim report will be made to the Life and Health Actuarial Task Force (LHATF) at the December meeting, outlining the recommended conceptual framework for valuation. In 1998, the task force will address how to implement that conceptual framework.

In tackling this project, the task force has developed a list of what it calls guiding principles. They're meant to be guideposts in reviewing the current valuation system. The list isn't intended to be exhaustive, but it does hit some key areas. The first principle is that the primary purpose of valuation is to protect policyholders and other creditors, to ensure that the policyholders will receive the benefits they contracted for, and that other creditors will be likewise reimbursed.

The second purpose is to adequately inform shareholders and to provide shareholders with sufficient information so that they can make timely and informed decisions with respect to actual and potential investments.

Next, valuation should provide an ongoing examination of a company, instead of just the static point-in-time analysis. It should be looking at the company's viability in the longer term. Valuation should recognize the entire enterprise, not just the individual pieces. The word holistic has been used a few times to describe that, but basically it says you must look at the enterprise as a single entity.

Finally, there's the principle that a valuation should be consistent between states. There should be a single set of results that are applicable in all states.

The Valuation Task Force, based on these principles, has identified three key objectives of an ideal valuation system, and I'll go through them quickly. There's the evaluation of the ability of a company to execute various business alternatives. Basically, does the company have adequate resources to meet their obligations as they come due? This adequacy would be tested for existing business and for new business, and would involve testing under a variety of scenarios, recognizing economic factors, the market environment, and any sort of regulatory pricing limitations, as well as the company's own business plans. The goal would be to answer some questions as to whether the company is viable and whether management's business strategy is viable as well. The intended audience for this type of information would be management. Some subset of this information would be available to policyholders, investors, and creditors.

The second objective is the evaluation of the adequacy of resources relative to obligations. Does the company have adequate resources to meet existing obligations? Scenario testing would recognize economic factors, the market environment, and any sort of regulatory pricing limitations. The intended audience for this information would be management, regulators, policyholders, investors, and creditors. I think a key point on these first two is to notice the application to all resources and all obligations of the company.

The third objective is to provide a statement that measures the level of assets needed to provide a high level of confidence to policyholders that their benefits will be paid as promised without forcing those policyholders to pay excessive amounts for that protection. This measures the company's resources and the change in those resources from accounting period to accounting period. The structure should be consistent within and among financial institutions, and it should accommodate measuring the company's financial condition and performance within a range of financial reporting systems in existence today. The intended audience for this information would basically be management.

What are some of the things that the task force is considering in sort of looking at this broad project in terms of rewriting valuation? One of the approaches that is being looked at is a risk theory model. It basically looks at some sort of multivariant distribution of profitability and solvency, recognizing all of the random variables, and determining some key values at some specific ruin probabilities like 95% or 99%. Again, those kinds of numbers are really sort of subject to further development. The intent here is that, as the state-of-the-art of actuarial modeling, tools, and techniques advance, these kinds of analyses can be done quickly and easily and can come up with numbers that people can get some comfort with.

Another approach is market valuation. Can we develop a market value for a company? Since the difficulty here is, obviously, on the liability side, people are looking at ways to compute the market value of the insurance liabilities or develop a reasonable proxy. At Session 1, Donna Claire mentioned that the Financial Accounting Standards Board (FASB) is, again, looking at the fair value of liabilities. I think this is a question that will continue to pop up until we get some sort of a system in place to measure them.

Another piece is looking at the international accounting scene. What's going on in other countries? How do they address the problems that have been identified? What kind of solutions do they have? Are there any that are applicable to what we're looking at?

The last piece is looking at, basically, the state-of-the-art. What are the tools and techniques that are out there today that are available? What tools and techniques are being developed in the educational arena and in the finance arena? Are there tools out there that can help to look at the values of companies?

Again, such a broad subject is, obviously, going to impact many areas of insurance. For that reason, you do have liaisons with other areas. There are implications for property/casualty and health insurers. There are people from those fields who are involved in the task force. Obviously, any kind of new valuation system is going to impact things like risk-based capital (RBC), AVR, IMR,

statutory accounting, nonforfeiture, income taxes, state taxes, guaranty associations, and disclosures. The spectrum is all encompassing.

It's quite a large project and I think, at this point, the next step will be to produce the preliminary report that will outline these objectives, the principles, and some of the steps that the task force is taking to move forward. With such a broad project it's really important that people get involved with it and stay informed of the work of the task force. You were encouraged at another session to participate and to stay informed. Let me encourage you as well. This is going to have some far-reaching consequences on our profession. Certainly it's to your benefit to stay involved, but I think what's more important is your involvement to produce a final product that's going to be better because it will benefit from your input and your involvement.

MR. LAMSON: Thank you, Lou, for your fine update on the valuation efforts. It looks like you have much to do in the coming months. I'm going to turn the discussion over to Edwin who will give us an update on the Equity-Indexed Task Force.

MR. EDWIN R. REOLIQUIO: The Equity-Indexed Products Task Force was created at the request of the NAIC Life and Health Actuarial Task Force sometime in February 1997 to study, review, and make recommendations on the actuarial issues surrounding this product. We first met in Washington, D.C. in February and identified the issues that we wanted to take on. The task force decided that it will be working through the issues in stages with Phase Zero items being reviewed and studied and recommended at this time.

The task force was divided into subgroups. There is a subgroup on product description and nonforfeiture. There is one on market conduct and advertising. There is one on reserving, statutory, and GAAP accounting and reinsurance. There's another on investments; valuation actuary issues; SEC and federal issues; taxes; risk-based capital and asset valuation reserve/interest maintenance reserve issues; and guaranty funds.

In lining up the work we had to do in the task force, the group decided that there were some topics that had to be settled on first or at least be recommended first. These basically included reserving, valuation actuary issues, marketing and disclosure, and nonforfeiture issues. Our recommendations in these subgroups would lay out the groundwork for some of the work to be taken on in the later stages of the whole task force project.

My discussion this morning will focus on the reserving methods that we have or we are going to be recommending so far and it will actually be on annuities per se, because the life valuation methods are still being worked on. And I will also be touching upon valuation actuary issues for a few minutes of my discussion, and then I'll move onto nonforfeiture values.

At this time the task force is recommending a dual-track approach, and this will be presented at the NAIC meeting this coming Thursday. Under the dual-track approach, the first set of methods come under what we call the market value methods, and the second group is what we call the book value methods. The market value methods are methods where the current market value of the hedging options are used in the calculation of statutory reserves on the date of valuation. The book value methods do not employ the current market value of the options on the date of valuation, but rather, the calculations are based on the value of the options at issue and the current index values.

In coming up with recommendations for reserve methodologies, we had some guiding principles. Incidentally, this was first developed in relation to the annuity methodologies that we were working on. However, they are also being used with respect to the life methodologies that are currently being worked on.

The first criterion in selecting reserve methods is that we wanted the method to be a reasonable interpretation of the Commissioner's Annuity Reserve Valuation Method (CARVM) for annuities and the Commissioner's Reserve Valuation Method (CRVM) for life products and all relevant actuarial guidelines, including new interpretations thereof. We also wanted the method to be consistent with permitted statutory accounting of assets, and the reserving method and associated

asset valuation method should not cause unwarranted distortions in the statutory income and surplus of the company. We were also concerned that the method should be auditable, understandable, and practical to calculate, given the current state of existing valuation systems. This was one of the considerations why some of the methods initially proposed were taken off the list in the final recommendation.

We also wanted a method, or its underlying elements, to not be arbitrary, and the methods should not produce any new issues on assets or liability valuation for tax purposes. The method we said should be an acceptable interpretation of CARVM, so that it is translatable to tax reserves for the purposes of calculating these values. We also wanted the method to provide an adequate level of reserves suitable over a range of equity-indexed product designs and that the method be independent of the actual assets purchased, but draw upon their values.

We also said that the method should be the codification of statutory accounting requirements and, more importantly, that the methods should be flexible enough to be adaptable to new product designs.

We certainly talked about the valuation type to be used for the different benefits under this product, and as with regular annuities, we follow Actuarial Guideline 33 in setting the plan type for the death benefits and the annuitization benefits that are usually Plan Type A. We did look into what valuation type we should be using for the withdrawal benefits. People are kind of divided or there is one group of people that think that the disintermediation risk for this type of product is somewhere in between a market-value-adjusted product and a regular single premium deferred annuity (SPDA), but the jury's still out on that issue. However, we are proposing, in the Actuarial Guideline that's going to come out, that the valuation basis should be based on the Standard Valuation Law with regard to the withdrawal characteristics of the equity-indexed product. Simply stated, if you have a market value adjustment feature, it is typically a Type B product, and if it doesn't have that feature, it is typically a Type C valuation.

Let's now go into the recommended reserve methodologies. As I said, there are two methods. The first group is what we call the market value methods, and under this group we have what is called the CARVM with Updated Market Values, or CARVM-UMV, and the Market Value Reserve Method (MVRM). The second group includes the option cost-based method (OCBM) and the enhanced discounted intrinsic value method (EDIM). With respect to group one, the hedged value will be based on market values. With respect to the group two methods, the OCBM will have its hedge value be based on the current market value of the option, although that is not necessarily coming into play in the reserve calculations, and EDIM would have to use a hedge value equal to the amortized cost of the option, plus a present value of intrinsic value.

At the time I prepared this presentation, which was about a month ago, we had come up with some finality on some of the issues we had taken. Initially, we were talking about whether OCBM should have its hedge values be based on a hybrid amortized cost of market value, but in the final recommendation, OCBM will have the hedge values be based on the current market values.

The important thing about these two methods, with respect to using Group Two reserve methods, is we will have what is called a "hedged as required" certification that is to be provided if you have to use either one of these two methods under Group Two. If you use Group One you do not have to satisfy the "hedged as required" criteria which I'm going to discuss later. There is also a certification that the actuary would have to provide with respect to certain market-value option assumptions, and they should be reasonable in light of current economic conditions on the date of valuation which I'm going to discuss again later.

I would like to spend a few minutes now talking about the methodologies. What I'll try to do is capture the essence of these methodologies. There is a session at this symposium where the methods are going to be discussed in more depth, and there is a workshop where actual reserve calculations will be illustrated and shown for certain plan designs for each of these different methodologies.

Basically, the CARVM-UMV calculates the reserve by having two pieces calculated. The first piece being the regular CARVM that is produced out of looking at the guaranteed benefits without the benefit of the index portion. The second piece that needs to be calculated would be the current market value of the options projected forward at the statutory valuation rate. The two pieces are added to come up with what is called the basic CARVM reserve for this type of product. The advantage of this CARVM-UMV is that all benefits at maturity and in the interim are recognized, and the balance sheet assets and liabilities are responsive to market conditions. Like I said, the hedge options will be stated at market value, and the reserves also reflect the fact that the hedges are at market value. The big drawback to this method is that it is complex because it requires the calculation of option values for different time durations on the date of valuation.

The second method under the first group is what we call the market-value reserve method (MVRM). It is also deemed to perform the revised Actuarial Guideline 33 CARVM calculation. However, relative to the first method, what MVRM does is it projects the level of index at maturity, which is the sum of the strike price and the current market value of the call option accumulated at the valuation interest rate to maturity. From that you're going to calculate an implied growth rate that will get you from the current index at a time of issue or at a date of valuation to the projected index level at maturity. That implied growth rate is what you would use to project your annual benefits the way you would do CARVM. So future benefits in projecting the CARVM paths will be tied to the implied index that's calculated.

This method is easier to calculate than CARVM-UMV, and in looking at some of the modeling work that we've done, the reserves calculated under this method closely track with CARVM-UMV by no more than the difference of one-half percent. One disadvantage that could be said about this is that the projected benefits are based on the implied index, which is based solely on the projected index at maturity. Perhaps the CARVM-UMV may give more consistent results in practice.

Moving onto the third method, which was really included with Group Two, is a variation of MVRM. Basically, OCBM is exactly MVRM except that the implied growth rate that you determine at the

point of issue is locked in. That implied rate is calculated as the rate that would carry you from the date of issue to the index at the end of the term. The word term here is being defined in the set of "hedged as required" criteria that I'm going to be discussing later. It has the simplicity of what may be akin to an issue-year method because the index is calculated at a point of issue and the current option value is not needed for the purposes of calculating the statutory reserves, although you would need the current market value of the options for the purposes of stating your hedge options on the balance sheet.

The disadvantage is that because you're freezing the implied growth rate at a point of issue and the rate is locked in, basically, there might be an inconsistency between the asset values and the liabilities. Again, like I said, the details of all of these methodologies will be handled in Session 16 and 23 of this symposium.

The fourth method is rather elegant looking to some people, because it splits the reserve into two components -- a fixed component and an equity component. On the asset side, the book value of the option, which is the basis for reporting the hedged value, is the sum of the amortized cost and the equity component, and then you have a piece of the book value of the asset that cancels out with a piece of the reserve method. The fixed component at issue is an amount that is deemed to be adequate. We said that it should be an amount that is deemed to be adequate from the point of view of cash-flow testing. For us to make the reserve calculations a level playing field across all methods, we are recommending that the initial reserve to be employed under this method be the value to be calculated either under the MVRM, or CARVM-UMV, or the option cost-based method. As you could deduce from the description of the methodologies, the OCBM and the MVRM would produce the same statutory reserves at time zero. The fixed component at the end of the term is the floor of the benefit that is being hedged. For instance, if you project that 90% of the policyholders would surrender at maturity and 10% would annuitize at maturity, the fixed component is the sum of the 90% of the fixed component that grows to the floor of the surrender benefits and the 10% of the fixed component that grows to the floor of the annuitization benefit. Knowing the fixed component at time of issue and a fixed component at maturity, you then find the implied rate of interest that

would accumulate you from the initial value to the ending value for you to be able to calculate your intermediate values.

The equity component, which is the second piece, is the discounted present value of intrinsic value of the options, and the book value of the options is the sum of the amortized cost on the date of valuation and the discounted intrinsic value of the options. So there is that piece that is cancellable or that cancels out on both sides of the equation.

The enhanced discounted intrinsic value method (EDIM) is relatively simple to implement. It's flexible in accommodating different product designs. It accommodates the annual ratchet. We've taken out one of the disadvantages that we found in this method early on. We took out the element of arbitrariness by setting the initial reserve to the OCBM, the MVRM, or to the CARVM-UMV. The EDIM would produce acceptable reserves if the interim benefits are incidental or related to the intrinsic value at the end of the term, and would probably not produce acceptable reserves if the interim benefits are a multiple or unrelated to the end-point intrinsic value.

Let's move on to the hedged-as-required criteria. I stated earlier that if you were to choose an option two method, the OCBM or the EDIM, that you would have to certify to meeting this set of hedged-as-required criteria we call them. How did this come about? Book reserving methods are typically less responsive than market value methods to the changes in the economic factors underlying the equity benefits in the annuity contracts. To the extent that that is true, the difference between the value of the equity-indexed obligations arising from the contracts and the value of the financial instruments hedging these obligations may not be reflected in the statutory financial statements. Therefore, to minimize these mismatches we are proposing that the insurers using a book-value method should meet this criteria, so that, hopefully, they will utilize an investment strategy which, if employed, would produce cash flows and values that match the emerging obligations associated with the index obligations.

The first criterion relates to the certification where you would certify to the equivalence of the features in the hedged assets to the characteristics of your annuity obligations. With respect to this required equivalence, we also discussed what we called the option replication strategy if one were to employ it and, at this point, the task force is still reviewing the issue and is going to further analyze it. So it's not going to make it to this round of recommendations with respect to hedged as required.

The second requirement has to deal with the amount of options purchased and to be held by the insurer. We said that we are proposing a 3% per year tolerance on the lapse exposure, plus whatever decrements there are, such as death.

Items three and four relate to the equity-indexed benefits in the interim before the end of maturity, and we presumed that a company should have a specific plan for hedging risk associated with interim benefits. With respect to criteria number four, we presumed that a company would have a system in place to monitor the effectiveness of the hedging plan. Item number five also presumes that there's going to be a maximum tolerance for the difference between the expected performance of the hedge and the actual performance of the hedge. At this time, we're recommending that the tolerance be at 10% of the first $100 million of capital and surplus.

Let's discuss how you can meet the hedged-as-required criteria, which is a certification that is going to be required every quarter, if you started out with the CARVM-UMV or the MVRM. If you moved to group two or to one of the group two methods, OCBM or EDIM, you would have to notify the commissioner of your state of domicile, get his or her approval, and notify the commissioners of your other states of filing. If you start out with EDIM or OCBM and at one point in time you do not meet the hedged-as-required criteria, and you had to switch to CARVM-UMV or MVRM, all you would need to do would be to notify the file that was submitted by the commissioner of your state of filing. When you do not meet your hedged-as-required criteria, you either should do something so that you meet your hedged-as-required criteria within a quarter from the time that you do not meet it, or you'll be forced to move to the CARVM-UMV method.

I also would like to compare reserve values calculated for the European design under the four different methods. Table 1 is just meant to show you where the numbers are. The MVRM and the OCBM are very close to the CARVM-UMV. Again, when this presentation was prepared, it was done at a time when we didn't know how to set the initial reserves. We set it equal to a reserve that would pass cash-flow testing 95% of the time. How did we do that? We basically created a modeling team that looked at cash-flow accounts at the end of seven years using stochastic scenarios and then we said these are the levels of pass/fail for the different methods under different levels of reserves.

TABLE 1

European Product Reserves per $1,000 Initial Premium
Plan Type A Used for Annuitization and Death Benefits;
Plan Type C Used for Surrender Benefits

	Time Scenario	CARVM With Updated Market Values	Market Value Reserve Method	Option Cost Based Method	Enhanced Discounted Intrinsic Value Method	Market Value of the Call Options	Book Value of the Call Options (1)
0		971.70	968.16	968.16	967.22	208.64	168.24
2	5th Percentile Index Level	991.03	991.03	991.03	1,035.94	40.06	120.17
2	95th Percentile Index Level	1,448.70	1,447.89	1,498.56	1,364.29	602.41	448.52

Table 2 shows how the reserve is determined using the CARVM-UMV. You will notice a column for getting the option cost for the hedge for surrender benefits and for the option cost for the hedge of the annuitization benefits which are then added to the present value of the maximum guaranteed value that generates the highest value. For this particular case, it's $972 and $1,000 of premium.

TABLE 2

CARVM With Updated Market Values
European Product Design,
Plan Type C Valuation Rates

At Time 0														
Time	Surrender Option Cost	Face Value of Surrender Option Cost	Annuitization Option Cost	Face Value of Annuitization Option	Minimum Guaranteed Value	Surrender Benefit	Annuitization Benefit	Death Benefit	nPx	nPx Q_{x+n}	Surrender Cost	Annuitization Cost	Cumulative Death Benefit Cost	Reserve
0	0.00	0.00	0.00	0.00	900.00	900.00	1,000.00	1,000.00	1.00000	0.00000	900.00	934.14	0.00	934.14
1	122.05	128.77	64.11	68.44	927.00	927.00	1,030.00	1,098.44	0.99270	0.00730	872.26	894.74	7.51	902.25
2	144.89	161.27	92.31	105.19	954.81	954.81	1,060.90	1,166.09	0.98496	0.00774	844.95	856.58	15.43	872.01
3	161.80	189.99	112.47	136.82	983.45	963.45	1,092.73	1,229.55	0.97678	0.00818	818.08	819.63	23.70	843.32
4	176.22	218.30	129.57	168.26	1,012.96	1,012.96	1,125.51	1,293.77	0.96799	0.00879	791.50	783.72	32.46	823.96
5	189.64	247.86	145.20	201.28	1,043.35	1,043.35	1,159.27	1,360.55	0.95860	0.00939	765.25	748.85	41.67	806.92
6	200.14	275.96	157.79	233.50	1,074.65	1,074.65	1,194.05	1,427.55	0.94844	0.01016	739.20	714.89	51.47	790.67
7	209.60	304.91	169.14	267.19	1,106.89	1,411.79	1,497.06	1,497.06	0.93734	0.01110	909.71	829.80	61.99	971.70
														971.70

Table 3 shows you how the MVRM is calculated. I would like to point your attention to column three where we're trying to calculate the implied index growth rate, which is the basis for projecting your projecting benefits. It produces a value of $968 in relation to the $972 per $1,000 under CARVM-UMV.

Table 4 shows the OCBM reserve calculation. You notice that you come up with the same number as the MVRM.

Table 5 is on the enhanced discounted intrinsic value, which shows you an equity component and a fixed component.

Let's move on to cash-flow testing valuation actuary requirements. Of course, these methods are just formula reserve methods and they have to be complemented with cash-flow testing to determine that they're adequate. There is a practice note on Special Issues for Equity-Indexed Products that was included with the binder for this symposium and we encourage everybody to read that. Hopefully, we'll generate questions from the sessions devoted to equity-indexed products at this meeting. We're also recommending that the risk to be considered in cash-flow testing cover disintermediation risk, hedging risk, the enhanced benefit risk, liquidity risk, renewal risk, and counterparty risk.

Another requirement is there is a hedged-as-required certification for book value types, and there is also a certification required with the use of a market-value approach. The actuary would have to certify that the option values used in calculating the statutory reserves are reasonable in light of relevant economic conditions on the date of valuation and that they are consistent with the assumptions used to determine the statement value of any instruments used to fund the equity-based benefits in the contracts being valued.

TABLE 3

Market Value Reserve Method
European Product Design
Plan Type C Valuation Rates

At Time 0											
Time	**Minimum Guaranteed Value**	**Implied Index**	**Surrender Benefit**	**Annuitization Benefit**	**Death Benefit**	**nPx**	**$nPxQ_x+n$**	**Surrender Cost**	**Annuitization Cost**	**Cumulative Death Benefit Cost**	**Reserve**
0	900.00	891.03	900.00	1,000.00	1,000.00	1.00000	0.00000	900.00	934.14	0.00	934.14
1	927.00	942.76	927.00	1,030.00	1,049.35	0.99270	0.00725	872.26	894.74	7.18	901.92
2	954.81	997.50	954.81	1,060.90	1,101.57	0.98496	0.00768	844.95	856.58	14.66	871.24
3	983.45	1,055.41	983.45	1,092.73	1,156.81	0.97678	0.00811	818.08	819.63	22.43	842.06
4	1,012.96	1,116.69	1,012.96	1,125.51	1,215.27	0.96799	0.00871	791.50	783.72	30.66	822.17
5	1,043.35	1,181.52	1,043.35	1,159.27	1,277.12	0.95860	0.00930	765.25	748.85	39.31	804.56
6	1,074.65	1,250.12	1,074.65	1,194.05	1,342.56	0.94844	0.01005	739.20	714.89	48.53	787.73
7	1,106.89	1,322.70	1,411.79	1,411.79	1,411.79	0.93734	0.01097	909.71	782.54	58.45	968.16
											968.16

TABLE 4

Option Cost Based Method
European Product Design,
Plan Type C Valuation Rates

At Time 0											
Time	Minimum Guaranteed Value	Implied Index	Surrender Benefit	Annuitization Benefit	Death Benefit	nPx	nPx Qx+n	Surrender Cost	Annuitization Cost	Cumulative Death Benefit Cost	Reserve
0	900.00	891.03	900.00	1,000.00	1,000.00	1.00000	0.00000	900.00	934.14	0.00	934.14
1	927.00	942.76	927.00	1,030.00	1,049.35	0.99270	0.00730	872.26	894.74	7.18	901.92
2	954.81	997.50	954.81	1,060.90	1,101.57	0.98496	0.00774	844.95	856.58	14.66	871.24
3	983.45	1,055.41	983.45	1,092.73	1,156.81	0.97678	0.00818	818.08	819.63	22.43	842.06
4	1,012.96	1,116.69	1,012.96	1,125.51	1,215.27	0.96799	0.00879	791.50	783.72	30.66	822.17
5	1,043.35	1,181.52	1,043.35	1,159.27	1,277.12	0.95860	0.00939	765.25	748.85	39.31	804.56
6	1,074.65	1,250.12	1,074.65	1,194.05	1,342.56	0.94844	0.01016	739.20	714.89	48.53	787.73
7	1,106.89	1,322.70	1,411.79	1,411.79	1,411.79	0.93734	0.01110	909.71	782.54	58.45	968.16
											968.16

TABLE 5

Enhanced Discounted Intrinsic Value
European Product Design,
Plan Type C Valuation Rates

Time	Equity Component of Reserve	Fixed Component of Reserve	Reserve
Time 0	0.00	967.22	967.22
At Time 2, 5th Percentile Index level	0.00	1,035.94	1,035.94
At Time 2, 95th Percentile Index level	328.35	1,035.94	1,364.29

Nonforfeiture issues. We are proposing that these products, as with normal products, pass both the retrospective test for the nonforfeiture law and the prospective test. And if this product were to be filed as a modified guaranteed annuity, because it may have a market-value adjustment feature, I don't think the smoothness test is applicable to those types of products. However, the retrospective test is applicable.

There are some open issues with respect to equity-indexed products. Like I said, we are actually leaning towards proposing a Plan Type C for the surrender benefits. There is going to be an Actuarial Guideline that's going to come out as a result of all our recommendations in the task force and it's going to be presented and discussed at the NAIC meeting this Thursday. Option replication, whether it qualifies under the hedged-as-required criteria, is still to be reviewed and discussed. We are also in the process of looking at equity life reserving methods to be applied to these types of products.

MR. LAMSON: It looks like we have plenty of work to do. Turning to some more mundane topics, the topics I plan to cover this morning are shown on this screen. I plan to give you a brief overview of the important aspects of Actuarial Guideline 33, or the changes to AG 33, which has

to do with CARVM calculation, of course, and Guideline MMM, which deals with the reserving of minimum guaranteed death benefits in variable annuity products. Next, I'll describe two new valuation mortality tables for in-benefit annuity reserves, and then, finally, give you a very brief update on the status of XXX.

As I'm sure most of you are aware, there was a significant amount of confusion over how to interpret Actuarial Guideline 33 almost as soon as it was adopted. Some of that confusion was expressed at the 1995 symposium. In March 1996, the Annuity Working Group requested that the Academy's Committee on Life Insurance (COLI) identify the issues surrounding the guideline and suggest solutions, particularly regarding multiple benefit streams. COLI then formed the CARVM Multiple Benefits Work Group with Tom Campbell and Steve Preston as co-chairmen. Other members include Errol Cramer, Shirley Shao and me. We have proposed changes to the guideline which were initially described in a December 1996 *Financial Reporter* article and, also, in a follow-up article in the September 1997 issue.

The modified version of AG 33 has been adopted by the Life and Health Actuarial Task Force (LHATF) and the NAIC Life Insurance (A) Committee with Executive Committee approval expected next week at the NAIC meeting in Washington and then approval of the Plenary Committee at the December meeting.

Between the time the earlier *Financial Reporter* article appeared and the guideline's adoption by the Life and Health Actuarial Task Force, a few changes and additions were made to our proposal. First, the changes will not take effect until December 31, 1998 and, second, there will be a three-year phase-in allowed for any increase in reserves brought about by changes in the guideline. You will need to apply for the phase-in and demonstrate the adequacy in the aggregate of the phased-in reserves. Third, we improved the wording of the definition of *elective* and *nonelective benefits*. The new wording defines nonelective benefits and then leaves elective benefits as all other benefits. This provides that each benefit will belong in one and only one category.

Fourth, a provision was added to ensure that life or health riders attached to annuity policies would not be swept into the CARVM calculation. The wording is quite specific, so I don't think you'll be able to move benefits, such as free partial withdrawals, to a rider in hopes of avoiding the set-up of additional reserves for the benefit. Finally, some wording was added to be a bit more specific about how to determine the benefit amounts for elective and nonelective benefits when testing integrated benefit streams to find the greatest present value.

What are the clarifications included in the new Actuarial Guideline 33? First, and most important, is the clarification regarding the mixing, or integration, of the various benefits in modern annuity products. Specifically, it is now clear that you must blend together partial withdrawals and, potentially, partial annuitizations with ultimate full surrender or full annuitization. The guideline says that you must consider, not necessarily test, all potential combinations of benefits, integrated together into a projected stream of future benefit payments.

Obviously, no CARVM calculation can actually test all possible combinations, and most products will have an infinite number of possible streams. However, with an understanding of a product's features, you can analytically determine which categories of streams are likely candidates for producing the one with the greatest present value. You need to consider the combinations of benefits that can result. For example, the stream under which the policyholder always takes the maximum free partial withdrawal may not always produce the greatest present value because it might mean that future guarantees of a high interest rate, for example, might not thereby be fully reflected in the reserve. Obviously, this can get quite complex.

Second, there are benefits included in annuity policies that cannot be simply elected by the policyholder. One example is the death benefit, if we assume that the benefit is not so dear as to cause the policyholder to commit suicide to get it! For death benefits and other nonelective benefits, the guideline prescribes the use of incidence rates, such as valuation mortality rates, to determine the expected benefit payments. However, the guideline also makes it clear that, as noted above, you must consider, and not necessarily test, all possible sets of incidence rates for elective benefits.

This means that if you think the greatest present value might be achieved by assuming no free partial withdrawals during the first two projection years, for example, and then always electing free partials thereafter, then that set of incidence rates must be tested, along with all others that are necessary, to find the greatest present value. Once a stream of future benefit payments has been determined, then the present value calculations must be performed. As I'll describe in a bit more detail later, there is a separate valuation interest rate assigned to each benefit in the new AG 33 for purposes of discounting the integrated stream of benefits back to the valuation date.

To provide some comfort to us practicing actuaries faced with the real world problems of valuation, wording was included in the guideline relating to the use of approximations and analytical methods. We all know that reserves are inherently an approximation to the amount needed to be set aside to help fund the company's future obligations. AG 33 establishes a more refined interpretation of the CARVM method as a reserve standard. However, approximate methods and general analysis can still be relied upon in setting reserves that meet this standard.

The original wording of AG 33 described the tests that must be performed in finding the greatest present value. However, subsequent discussions with members of LHATF made it clear that these tests were not the only tests necessary to consider. Indeed, the regulators considered these tests to be merely examples of tests one must consider in establishing the CARVM reserve. Nonetheless, the separately specified cash value and annuitization tests in the original wording did allow for confusion to develop over whether the benefits should be considered separately or together, in an integrated fashion, in finding the greatest present value.

Under the separate benefits approach, one would only consider a single benefit in calculating the expected benefit payments from the annuity policy. For example, a stream might consist only of death benefits with all policyholders eventually dying, but none ever surrendering or taking partial withdrawals. Under the integrated approach, you can first determine what elective benefit options you would like to assume that policyholders elect, and then calculate the account values that will result following payment of those benefits. For example, if a free withdrawal is assumed to be paid

in each future time period, then the account values available to provide other benefits will be reduced accordingly. The incidence rates for each nonelective benefit are then used to determine the expected payments under each benefit using the account values which reflect the elective benefit payments. You must remember, however, that the elective benefit payments are only paid on policies that stay in force. Therefore, if the nonelective benefits result in policy termination, such as occurs under the death benefit, only the policies of surviving policyholders will generate future free withdrawals, for example.

To categorize the benefits into the nonelective and elective classes, one needs to look to the guideline's definition. The key words are "occurrence of a contingent event" and "scheduled event independent of an option" in making that determination. Examples of benefits that would typically fall into the nonelective category are death, accidental death, disability, and nursing home. An example of a scheduled payment without options would be a deferred life annuity. The incidence tables for nonelective benefits are those specified by the Standard Valuation Law or by regulation. As usual, in the event no tables have been prescribed, you must use judgment in finding an appropriate substitute, such as industry or company experience.

Some possible examples of elective benefits are all other benefits with full surrenders, partial withdrawals, and full and partial annuitizations. The key here is elective benefits involve benefit options that may be freely elected under the terms of the contract. As noted, you must consider all possible incidence rates for elective benefits, and judgment may be required for some benefits to place them in one or the other category.

As noted earlier, under the new AG 33, there's a separate valuation interest rate to be used for each benefit. Therefore, you will need to keep the expected benefit payments for each elective and nonelective benefit in an integrated benefit stream separate from each other to discount them at potentially different rates. Some examples are: death benefits, withdrawal and surrender benefits, annuitization benefits, and nursing home or other ancillary benefits.

In order to determine the valuation interest rate for each benefit, you must consult the Standard Valuation law with five parameters required by the law to determine the interest rate. Under the new AG 33, three of these parameters are set at the contract level: valuation method (that is issue year or change in fund), whether the contract guarantees interest on future premiums, and whether it provides cash settlement options. The other two parameters are set using the characteristics of each benefit -- the guarantee duration and the plan type. The guarantee duration is set as provided in the Standard Valuation Law. For annuitization benefits, the guarantee duration is the period of time from the issue date to the date benefits commence.

For surrender and withdrawal benefits, you count the number of years the contract guarantees interest in excess of the long life rate to set the guarantee duration. For nonelective benefits, a similar determination is used and because benefits can generally begin to be paid immediately after issue, a guarantee duration of one applies.

The plan type is also set as provided under the Standard Valuation law. For term-certain annuitization payments of less than five years, a plan type of C applies, whereas, it is Plan Type A for other payments. For withdrawal or surrender benefits, the plan type can be C or A depending on whether there is a market value adjustment of the benefits. The plan type for nonelective benefits is generally A, as no withdrawals are permitted. Again, AG 33 merely clarifies the definition of CARVM as a reserve standard. Approximations and analytical shortcuts are certainly appropriate. However, you must be able to defend them in showing reserve sufficiency.

In applying AG 33 to the analysis of CARVM reserves for various types of products, I have found it to be more difficult than before, particularly, if you try to determine which types of benefits are driving the reserve in terms of which stream produces the greatest present value. You can discover that this changes from one policy duration to another. Also, the stream with the greatest present value may produce a present value very similar to that of other streams.

By eliminating or reducing a particular benefit, such as you might be able to do in new product development, you may be frustrated to find that the reserve doesn't necessarily change a great deal because another benefit stream with similar present value may now be driving the reserve.

In assessing the impact of the new guideline on your reserves, you should consider at least one item. Generally, you will find that the biggest impact is in reflecting the stream of free partial withdrawals. However, the issue year and, hence, the size of the valuation interest rate plays a major role in the impact of the changes.

Now let's turn to another actuarial guideline that affects annuity business. Actuarial Guideline MMM relates to the minimum guaranteed death benefit (MGDB) provisions included in many contemporary variable annuity products, such as return of premium, roll-up of premiums, reset or ratchet. MMM requires that a reserve be held in the general account for the possibility of payments made under these benefit provisions, both direct and net of reinsurance.

Guideline MMM has been adopted by LHATF and the Life Insurance (A) Committee to become effective at the same time as AG 33. It will also apply to business written, and in force, over the same period. Like AG 33, you may apply for a three-year grade-in of the reserve. It applies to variable annuities, both group and individual, except that the same group business exempt from the Standard Valuation Law is also exempt here. Under MMM, the MGDB reserve is calculated as the excess, if any, of the integrated reserve over the separate account reserve. The separate account reserve is the amount held by disregarding the MGDB benefits. The integrated reserve is the same as we've been reviewing, except that net amounts at risk, determined using the MGDB provisions and the assumption of an immediate drop in account value, are combined with the other benefits.

MMM specifies integrated benefit streams to include the three components A, B, and C, where A consists of net amounts at risk based on reduced account values; that is, the account value remaining after an assumed drop in market value, projected forward at net assumed returns. Component B is the stream of death benefits paid under the integrated benefit stream under consideration, but

ignoring the MGDBs. Therefore, it is the unreduced account value, projected forward at the valuation interest rate, less asset-based charges, and C is all other benefits in the integrated benefit stream.

MMM specifies drop percentages that are applied to the account value and vary by asset class. The guideline specifies five different asset classes into which the actual variable funds are to be allocated. All fixed account funds have a drop percentage of zero, of course. Once reduced by the drop percentages, the reduced funds are projected with net returns derived from gross assumed returns by subtracting asset charges. These gross assumed returns also vary according to the same five asset classes. The guaranteed rate is used to accumulate the fixed funds.

Table 6 shows the actual drop percentages and gross assumed returns for each asset class. They were derived using ten years of Morningstar data and another 25 years of data from other sources such as the S&P 500. They were designed to produce adequate results for 83% of historical periods.

As mentioned, the gross assumed returns are reduced by the asset charges assessed in a variable annuity in converting them to the net assumed returns actually used to project the reduced account values. The net amounts at risk for quantity A are determined by projecting both the MGDB death benefits and the reduced account values into future periods, with the net amount at risk being the excess, if any, of the MGDB benefit over the projected reduced account values. As indicated earlier, these amounts are essentially added to the death benefits provided under each integrated benefit stream. The projected unreduced account values are used to determine the quantities B and C in the integrated benefit stream. The fixed funds are projected at their guaranteed crediting rates, of course. The variable funds are projected at the valuation interest rate, less asset charges.

The mortality rates to be used for all the calculations required under Guideline MMM are those from the 1994 Variable Annuity MGDB Mortality Table. This is true of all components -- A, B, and C.

TABLE 6

Drop Percentages and Gross Assumed Returns by Asset Class

Asset Class	Immediate Drop Percentage	Gross Assumed Return
Equity	14.00%	14.00%
Bond	6.50	9.50
Balanced	9.00	11.50
Money Market	2.50	6.50
Specialty	9.00	9.50

This table was derived from the 1994 Group Annuity Basic Table with margins of about 10%. The table is to be used without projection, of course. The Society of Actuaries MGDB Task Force is studying mortality to validate the rates in this table.

Reinsurance creates an interesting reserve situation for MGDBs. Guideline MMM specifies the calculation of a reserve net of reinsurance as a first step. This is accomplished by modifying the A and B components of each integrated benefit stream used in calculating the direct reserve to produce the components shown on this slide. As you can see, A is adjusted to reduce the net amounts at risk by the reinsurance recoveries that would occur under the projection. Likewise, the quantity B is also reduced for reinsurance recoveries, if any. Quantity C is the same as for the direct reserve. There is a new quantity D interjected, however, which represents the gross premiums projected to be paid for reinsurance during the projection of the reduced account values.

The greatest present value of all such adjusted integrated benefit streams is then determined, and the result represents the integrated reserve net of reinsurance. This net reserve is then subtracted from the direct integrated reserve to arrive at the reinsurance reserve credit. Note that the greatest present value may not occur for the same integrated benefit stream as for the direct reserve. Also, since it

is possible for the reserve net of reinsurance to be greater than the direct reserve, a negative reinsurance reserve credit can result.

For reinsurance assumed, the reserve is obtained by determining the greatest present value of the quantity shown below:

$$(A-A^r) + (B-B^r) - D, \text{ where}$$

- A^r: Direct "A" NAR's reduced by reinsurance recoveries
- B^r: Direct "B" Unreduced AV's paid on death reduced by reinsurance recoveries
- C: Direct "C"
- D: Projected reinsurance gross premiums using projected reduced account values

In calculating this amount, you are to use the same valuation mortality and interest rates as the ceding company uses. The integrated benefit stream, for which the greatest present value occurs, may be different for the reinsurer than the corresponding benefit stream used to compute the reserve net of reinsurance.

Now that we've digested all that Actuarial Guidelines 33 and MMM have to offer, consider the new valuation mortality tables that have been recognized over the last year by the NAIC -- the Annuity 2000 Table and the 1994 Group Annuity Reserving Table. Both these new tables have been adopted through an NAIC model called "The Model Rule (Regulation) for Recognizing a New Annuity Mortality Table for Use in Determining Reserve Liabilities for Annuities." What a mouthful! This rule was originally created to adopt the 1983 Table a, and the NAIC has merely amended it to provide for the new tables.

The 1983 Table a can be used following the 1976 Amendments to the Standard Valuation Law up until the original adoption of the rule, and then either the 1983 Table a or the Annuity 2000 Table can be used up to the time the amended rule is adopted. Following this date, only the Annuity 2000 Table may be used. Following adoption of the amended rule, the 1983 Table a, without projection,

can be used for reserve calculation for annuities arising from court settlements, workers' compensation claims, and long-term disability claim settlements.

Group immediate annuity valuation mortality can be taken from the 1983 Table a, the 1983 Group Annuity Mortality Table or the 1994 Group Annuity Reserving Table for annuities purchased following the 1976 amendments and until the original adoption of the model rule. Either the 1983 Group Annuity Mortality Table or the 1994 Group Annuity Reserving Table may be used following that original adoption and until the adoption of the amended model rule, after which time only the 1994 Group Annuity Reserving Table may be used.

The 1994 Group Annuity Reserving Table was developed by the Society of Actuaries' Group Annuity Valuation Table Task Force. The mortality rates are projected on a generational table basis using the projection formula shown below:

$$q_x^{1994+n} = q_x^{1994} (1\text{-}AA_x)^n$$

The Annuity 2000 Tables were developed by the Committee on Life Insurance Research and Bob Johansen using the 1983 Table a Mortality and Projection Scale G to take them from 1983 to be effective in the year 2000. Only 50% of the Scale G rates were used for females, as mortality improvements for females have not been as dramatic as for males. There are nine tables blending male and female mortality. However, only the sex-distinct mortality tables may be used for satisfying the minimum valuation standard, that is, 100% male, or 100% female, regardless of whether the benefits are provided under business covered by the Norris decision. Table 7 on the bottom indicates the letter associated with each of those tables. As in the 1980 CSO Tables, they go from A to G, and then there are two additional tables denoted by the seven and the two. That's for the blended mortality.

I'm going to only briefly state the current status of adoption of the Valuation of Life Insurance Policies Model Regulation, also known as XXX. It has been adopted in six states, all of which have utilized the Illinois approach. It is not effective until states whose population totals to at least 51%

TABLE 7

	A	B	7	C	D	E	2	F	G
Male	100	80	75	60	50	40	25	20	0
Female	0	20	25	40	50	60	75	80	100

have adopted similar regulations. The total percentage is now approaching 30% with five more states in the process of adoption. Texas and Oklahoma are threatening a January 1, 1998 effective date, and various other states are studying the model regulation for adoption. However, the National Alliance of Life Companies (NALC) is recently proposing that a replacement for XXX be developed. They state that the benefits to be derived for the consumer are less than the costs passed onto them. In addition, they believe the reserve mortality is too high, the general approach taken with XXX is flawed, and that it causes unusual product designs to be developed.

The NALC has put forth a proposal. It calls for the Wilcox American Academy committee to develop a long-term solution, and for LHATF to develop a replacement for XXX with the NALC offering to help develop such a replacement. The proposal suggests that if no replacement is adopted by LHATF by the end of 1998, that the NALC will encourage all states to adopt XXX with the 51% provision.

MR. ANDREW F. BODINE: Regarding the new mortality tables, what's the situation with state adoptions? Are state adoptions needed, or does it just flow automatically to be effective in 1998? Or if state adoptions are required, who knows what states have adopted it and what the progress is?

MR. LAMSON: I think that follows the statement in the Standard Valuation Law where new tables can be adopted by the commissioner as long as they've been adopted by the NAIC.

MR. BODINE: As I recall, it does include a phrase with specific approval by the commissioner, and I don't know what the commissioners have done. At Session 1, Donna Claire made a flat statement that it would be effective in 1998.

MR. LAMSON: I'm uncertain as to the state adoption of that. If anyone else can comment on that I'd appreciate it. Any other questions for the panel?

MR. BRYN T. DOUDS: This is probably something completely out in left field. I know the banks are, in essence, pushing for federal regulation of any of their activities in insurance. Much of the effort seems to be in trying to get all states to do the same thing on the valuation issues. Has anyone been proposing or thinking about federal regulation?

MR. LAMSON: I would certainly like to throw that out to the audience as well. One of the trends that seems to have occurred in recent years is the adoption of actuarial guidelines which technically don't have the force of law. We'd better all abide by them. The nice thing about those is that they're adopted without individual state election. It's more like it would be if we had federal regulations. Do any of the panelists have comments on this question?

MR. PIROG: Just an observation. I think the NAIC's accreditation program is designed to rectify that situation, and it's just an issue of the states getting approval and deciding that they are going to, in fact, follow a distinct set of guidelines.

MR. JEFFREY W. STEVENSON: I have a question on the MMM and the reserves for the variable annuity minimum death benefit guarantee. You went through the process where there were asset classes, and assumed drops, and growth rates and said that those were determined based on an 83% confidence interval. Those drops and growth rates covered 83% of the historical rates. I was wondering, what is the source of the 83%?

MR. LAMSON: Tom Campbell was chairman of that work group and he happens to be sitting in the front row, so I'd request that Tom answer that question.

MR. THOMAS A. CAMPBELL: The 83% was fairly arbitrary. We talked to regulators and in no place in any of the regulations was there anything that said reserves have to be adequate x% of the time. Most regulators felt it was somewhere between 75% and 85%. The one constant that they had was that when you add reserves and risk-based capital, the expectation was that you were at a 95% confidence interval. We chose 83.33% just as a consensus in working with the Life and Health Actuarial Task Force. It has been a while since I took part two, but I believe 83.33% corresponds to one standard deviation.

MR. STEVENSON: I have a follow-up question to that, that I guess might prompt some discussion. We're at the Valuation Actuary Symposium. We also go to sessions where you talk about cash-flow testing. There are often reserve adequacy tests that are done on the interest-sensitive business. Does anybody want to venture a guess at what confidence level they usually come up with on the other reserves when they're doing cash-flow testing?

MR. LAMSON: I don't really have any statistics on that.

MR. PIROG: I'm not sure what the industry-wide practice is, but I know that we tend to try to go for about an 85th percentile, which is about one standard deviation and that's kind of what we consider moderately adverse.

FROM THE FLOOR: Is that in the Practice Notes?

MR. REOLIQUIO: One guiding principle that we also discussed within the Equity-Indexed Products Task Force was in looking at the reserve methodologies that we were studying. That goes back to what Tom said -- the reserve plus the RBC should constitute about a 95% pass ratio. We did a lot of modeling work in relation to how much of your scenarios would fail or pass for the different

methods, and those are going to be submitted in a table that the NAIC is going to be looking at this Thursday, just to show them or give them a feel for where the reserve adequacies are with respect to the different methods.

FROM THE FLOOR: The variable annuities are mainly separate account products, and I have always been under the impression that there's less risk-based capital associated with that. Maybe I'm missing that. Does anybody know, in RBC for separate account products, how that compares with the general accounts?

MR. PIROG: Well, I think it's going to depend on what the separate account is. If it's just basically pass through equity experience, it's going to be zero. If there's some kind of a guarantee supporting it, then I think you're going to have something higher.

FROM THE FLOOR: I think what I'm getting at is I'm trying to come up with 95% when you have a pure variable annuity product.

MR. CAMPBELL: There is an RBC requirement that covers the CARVM allowance which is new. It was passed this last year where there's a 10% requirement for the CARVM allowance where the surrender charge is based on the account value. I think it's 2% where the surrender charge is based on past considerations, less withdrawals. In addition, the risk-based capital task force of the NAIC is going to work on developing risk-based capital requirements for minimum guaranteed death benefits for the amount at risk. At this point there is nothing specific.

MR. PIROG: I want to just add that I think for the deferred sales charge piece, if you're doing the receivable/payable kind of transfer, it gets sort of unwound.