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## **Session 57PD Follow-up To Risk-Based Capital C-3 Component Methodology Change**

Track: Investment

Moderator: LARRY M. GORSKI  
Panelists: CHRISTOPHER J. FOOTE  
LARRY M. GORSKI  
ALASTAIR G. LONGLEY-COOK

*Summary: The calculation of the C-3 component of risk-based capital changed for some companies starting with financial statements for year-end 2000. Companies affected by the regulation must use a new methodology based on surplus projected under stochastically generated economic scenarios. Many companies are exempt from the new approach, but may wish to perform the analysis to review results and present them to the rating agencies.*

MR. LARRY M. GORSKI: I'll lead off, but I'll give my introduction last. Alastair Longley-Cook will follow. I'm sure many of you know him. Alastair is a Fellow of the SOA. After a distinguished career of 28 years at Aetna, he joined Tillinghast in January 2001 as a senior consultant. Alastair is a frequent speaker and author of several papers on risk management. You may not know this, but he's been recently appointed to be the Chair of the AAA Life Risk-Based Capital Committee, the group that interfaces with the regulators on risk-based capital (RBC) issues. One thing to note is that with Alastair's background in risk management, he may bring some new ideas to RBC, which are welcome.

After Alastair will be Chris Foote. Chris is also a Fellow of the SOA. He's an actuary at Consec, working with several of the companies in the group. Prior to Consec, he worked at Union Central and also at Aetna. Chris's responsibilities include asset liability management within the annuity business line. And in his capacity he has worked with rating agencies on capital adequacy issues.

I'm the Life Actuary with the Illinois Department of Insurance, a Fellow of the SOA, and Chair of the NAIC Life Risk-Based Capital Work Group, the group that will interface with Alastair and the Academy Committee.

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In this session, we will try to accomplish several things. First, there will be an overview of the new methodology to compute the C-3 component of statutory RBC and quantification of the impact of the change in methodology. I'll discuss some issues from a regulatory perspective, and then Alastair and Chris will discuss and analyze the changes from a company perspective and provide their interpretation of the results. Clearly one of the main issues that was identified early in the process of changing methodologies was the implication relative to the volatility of results. Our speakers will touch on that. Each of us in the course of our prepared comments will talk about some of the new developments on the horizon for RBC.

I'd like to spend a few moments to put everyone on the same page relative to understanding regulatory RBC in the U.S. Essentially, it's a formula-driven calculation of minimum capital. The two key phrases in my sentence are: one, formula driven and two, minimum capital. It's not target capital. It was designed as a regulatory tool to distinguish well-capitalized from poorly capitalized companies. There are four basic components to the RBC formula: an asset default risk and value fluctuation component, an underwriting risk component, and interest rate risk component, and a business risk component. All of these components are combined using a covariance adjustment. The focus today will be strictly on the interest rate risk component.

I was at a session yesterday dealing with stochastic risk modeling in banks versus insurers. And for those who were there, you may have heard Donna Claire in her initial comments mention a fact that, from a regulatory perspective in the U.S., things are starting to change, but change very slowly. What she was referring to were the activities in the RBC area and the change in the quantification of interest rate risk or C-3 risk.

At a high level, the project to introduce modeling into the RBC calculations has three phases. Phase one was adopted last year for year-end 2000. It deals strictly with the interest rate risk associated with asset and liability cash flows and how they change as interest rates change. We're working on phase two now to introduce modeling into the formula relative to variable annuity, guaranteed living and guaranteed minimum death benefits. Phase three will do the same thing, but for equity indexed annuities. That's the high-level discussion of RBC.

The basic premise for what was adopted for implementation at 2000 year-end is that RBC for C-3 or interest rate risk for single premium life and annuities that are cash-flow tested for reserve adequacy purposes should be based on cash-flow modeling and not on factors. The key points here are annuities, cash-flow tested for reserve adequacy purposes, and cash-flow modeling. I'll discuss each of those three important points.

The way the rules are set up, certain companies are required to do cash-flow scenario testing for the RBC calculation. Those that are not required to do it are, in fact, prohibited from doing it. It's a one-way street. You have to be required to do it in order to gain the advantage, in some cases, of the cash-flow scenario testing.

The Academy Group and the regulators felt that RBC should not be the driver of the requirements to use modeling for RBC purposes. The basic test is whether the blocks of business of single premium life and annuities were cash-flow tested for reserve adequacy purposes. If the products were not tested for reserve adequacy using cash-flow testing techniques, then you're not required to do it for RBC purposes and you're not permitted to do the cash-flow scenario testing for RBC purposes. I'm going to be switching between using the phrase "cash-flow testing" and "cash-flow scenario testing." When I say cash-flow testing, I'm strictly talking about asset adequacy reserve testing. When I talk about cash-flow scenario testing, I'm talking about RBC.

I'm not sure whether the test I just talked about is an incentive or disincentive, because most of the companies that were required to do cash-flow scenario testing for RBC purposes resulted in their RBC decreasing compared to the factor-based approach, so there's an element of being an incentive. On the other hand, because there is much more work to be done, maybe that's a disincentive for doing cash-flow testing for reserve purposes. The jury is still out on that question. Again, I want to emphasize the point that I'm using two different phrases, cash-flow testing and that's for reserve adequacy purposes and it's not the same thing as cash-flow scenario testing, which is associated with RBC.

In my earlier description of the basic premise, I said the word "annuities" was important. "Annuities" is defined to mean products with the characteristics of deferred and immediate annuities, structured settlements, guaranteed separate accounts, GICs, including synthetic GICs, and funding agreements. A very broad definition was given to annuities and it was definitely constructed with the idea of growing and changing with time and not simply be limited to products with a certain name. And, hence, the use of the word "characteristics." If a company would come out with a product that looks, smells, and feels like a GIC, or a funding agreement, and calls it something else, it would still be considered an annuity for this purpose.

The changes that were adopted for year-end 2000 really had two components. One is the replacement of the factor-based results with modeling results. That's been given a lot of attention. But there's also a second component and that is the factor-based approach given to RBC for callable bonds. This change was aimed at trying to provide some measure of RBC for highly complex securities, interest only (IO)s, things of that form in which prepayments can eliminate the value of that security very rapidly.

It's a formula-based approach. The RBC is 50% times the difference or the excess of the statement value over call price. In this case, your call price is defined to be the value that the investor would realize if the instrument was immediately called or if all the underlying collateral was prepaid. The calculation is on the asset-by-asset basis.

The basic algorithm that one goes through to comply with the new C-3 requirement is spelled out on the next couple of transparencies. There are four quantities, A through D. The first thing you do is to separate your business into two

blocks. One block consists of annuities and single premium life that was cash-flow tested for reserve adequacy purposes versus all other business. Then you do the same thing for the callable assets. You allocate some of your callable assets to the products that were cash-flow tested, the single premium life and annuities, and then you allocate the remaining callable assets to the other block of business. And that includes callable assets that you may have internally allocated to capital and surplus.

You now have four quantities with the fifth quantity being the calculated C-3 amount based on cash-flow scenario testing. I'll call that quantity (E). Your factor-based C-3 RBC is the sum of the first four quantities, obviously. To calculate your actual C-3, if you are required to do cash-flow scenario testing, you reduce the sum of the five quantities of the factor-based approach by the factor-based RBC for the business that was tested, including the callable bond component. This amount is subject to a maximum of two times the factor-based approach and a minimum of 0.5 times the factor-based approach.

The capping and flooring was included because there was really no way to test the impact of this proposed change before the change was implemented. Historically, before any significant changes were made to the RBC formula, the impact on the industry was quantified and evaluated. In this case, it really wasn't possible to do that. We needed some kind of mechanism for constraining the results and, hence, this min and max approach. It's also in line with the idea of walking before you run.

The idea of putting a floor and a ceiling on the results really stems from four basic concerns, two from the regulatory side, two from the industry side. If you look at the composition of the NAIC Life RBC Working Group, you'll recognize that there are really very few actuaries in that group. With non-actuarial regulators there's a concern over the ability of the actuary when exercising judgment to act professionally.

Also, some regulators felt that by making the process more precise, more customized, it would cause the formula to be used in ways contrary that were intended as a broad-brush classification scheme and would be used more for ranking companies.

From the industry side, the concerns were over the volatility of results and one company's distrust of another company's valuation actuarial work. There's always a point at which insurers begin to get concerned with the decisions being made by competition. You hear a lot of this at NAIC meetings.

Ideally, this process was supposed to result in all companies having to do the more refined cash-flow scenario testing for RBC. But, as often is the case, the industry out of practical concerns and cost concerns argued for some safe harbors. And, at the last moment in the process their recommendation won out. What was adopted was a process for exempting certain companies from doing cash-flow scenario testing based on the so-called exemption tests.

The exemption tests have two components. One is a significance test. The other one is a stress test. If a company fails either one of these two tests, then they're required to do the cash-flow scenario testing. The significance test simply tries to measure whether a company's business subject to the cash-flow scenario testing is significant relative to all the company's risk as measured through RBC. The benchmark is 40%. The C-3 stress test, which was designed to measure the company's total adjusted capital relative to its capital needs after stress testing the RBC formula.

Again, the significance test attempts to identify those life insurers for which interest rate as measured for the formulaic RBC basis is important. The stress test attempts to identify those life insurers that are less well capitalized after stressing the C-3 formulaic component. Both tests came about because of industry concerns over expenses.

The significance test looks at the ratio of the four components, which were previously identified as A, B, C, and D. The test ratio is calculated as the factor-based results for the tested versus nontested business and a corresponding formula-based RBC for callable bonds over the sum of each of the RBC components. It's pretty simple test. One thing that wasn't considered when the test was being developed was the introduction of revised C-1 factors reflecting codification. The C-1 component is, essentially, driven by your RBC for bonds.

There was an exhaustive study done by the Academy RBC Group to analyze the factors and whether the factors should change as results of the earlier recognition of taxes and statutory accounting. As a result of that work, the C-1 factors on average were reduced by about 15%. If you accept that, and recognizing that C-1, in many cases, drives the RBC for a company, the significance test results may turn out differently than they did last year. For those companies that were exempt from the C-3 cash-flow scenario testing, they should look at what happens under the revised C-1 factors.

The stress test that I mentioned is simply the formulaic RBC for the cash-flow scenario tested products, multiplied by 7.5, and then the adjusted amount is used in the RBC formula. If your results are greater than 100% when compared to total adjusted capital, you're exempt, meaning that you have a very well-capitalized company after stress testing the RBC results.

Okay, now for some results. For many of you this may be the first time you're seeing some of the industry wide effects of the new initiatives. First, we'll deal with the callable bonds. I used the data from the NAIC RBC database as of year-end 2000. On an industry wide basis for the 1,170 companies in the database, total RBC authorized control level was \$47.4 billion contrasted to the authorized control level RBC at 12/31/91 of about \$34.8 billion. You can see the growth in the RBC requirements since the inception of RBC by regulators back in 1992.

The callable bond component is about one percent or \$476 million. It's really trivial. The allocation between the business that was RBC scenario tested and the factor-

based business is almost an even split. Eighty-five of the companies fell within the zero to five percent range, 12 companies between the five to 10% range, two companies 50% to the maximum. The maximum was 107% of authorized control level RBC.

What I gather from this information is that my guess is that not all companies read the instructions properly for this RBC component. My gut feeling is that there would have been more companies reporting RBC for the callable bond component. One of the things I intend to do is to compare the companies that reported RBC for callable bonds to a report that regulators call the CMO Flux Score Report. The report measures the relative cash-flow volatility of a company's Collateralized Mortgage Obligation (CMO) holdings. You can quickly identify those companies that are holding some exotic tranches of CMOs. This may serve as a good cross reference to see if companies that are holding the exotic tranche of a CMO are reporting any RBC for callable bonds.

On the actuarial cash-flow scenario testing, application of the tests resulted in 48 life insurers being required to do the cash-flow scenario testing. Fifteen companies reported zero RBC for the cash-flow scenario tested product. That doesn't mean their RBC was zero for the C-3 component because of the flooring mechanism. But if the floor had not been there, the companies would have reported zero for the cash-flow scenario-tested products. For the companies that were required to do the scenario testing, the reserves on those products were \$349 billion with an average per company of \$7.3 billion in reserves for those cash-flow scenario tested products. Clearly, our intention was to focus in on large companies, and we were successful in doing that. C-3 RBC Results for 2000 are as follows:

- 48 life insurers reported C-3 RBC based on cash flow scenario testing (CFST).
- 15 companies reported \$0 as RBC for CFST products.
- Reserves on products with RBC based on CFST—\$349 billion: average \$7.3 billion per company.

I examined the results from this past year by looking at three different ratios. Ratio one considered all of an insurer's business, both the cash-flow scenario tested and the other business. The ratio was computed as the ratio of reported C-3 RBC to the factor-based C-3 RBC (Ratio 1). As you can see, of the 48 companies in the study, 32 came in at the floor. That was not unexpected. One of the ideas I always stressed when we were discussing this project is that those companies that are well managed from an interest rate risk standpoint should be able to take advantage of the actual lower RBC.

## Ratio 1

C-3 RBC  
Results for 2000Ratio 1 (All business)  
(Reported C-3 RBC)/(Factor Based C-3 RBC)

<u>.5</u>	<u>.5-.59</u>	<u>.6-.69</u>	<u>.7-.79</u>	<u>.8-.89</u>	<u>1.0-1.09</u>
32	2	4	4	1	1
<u>1.1-1.49</u>	<u>1.5-1.99</u>	<u>2.</u>			
2	1	1			

The fact that most companies came in at the floor was not unexpected. It wasn't alarming to me. What was surprising to a few regulators is the fact that five companies had results that were in excess of the cap of two. I think many regulators who are unfamiliar with the professionalism of actuaries expected everyone to have a lower RBC. In fact, five of the 48 had results that reflected a strengthening of RBC as compared to the formula factor-based RBC.

The second ratio I looked at (Ratio 2) focused in strictly on the cash-flow scenario tested business. The numerator of the ratio was the cash-flow scenario tested C-3 RBC. The denominator was the factor-based C-3 RBC. This is without the artificial constraints of 0.5 and 2. As you see, 15 companies would have had a zero RBC for this block of business. The maximum rate was 2.85%. The ceiling did impact one company.

## Ratio 2

C-3 RBC  
Results for 2000Ratio 2 (CFST Business)  
(CFST C-3 RBC)/(Factor Based C-3 RBC)

<u>0</u>	<u>0-.24</u>	<u>.25-.49</u>	<u>.5-.74</u>	<u>.75-.99</u>
15	15	1	11	1
<u>1.0-1.49</u>	<u>1.5-1.99</u>	<u>2.85</u>		
3	1	1		

I had a chance to review some of these results with other regulators at the NAIC meeting that concluded about a week ago and some people were really surprised at this. For those that were not supportive of this project initially, there may have been a few converts.

The next ratio I looked at (Ratio 3) compared the cash-flow scenario tested C-3 to the cash-flow scenario tested reserves to give some feel for the results when you're looking at them on a factor basis. The current methodology takes all of your annuity business and breaks it into three camps, low risk, medium risk, and high risk. The idea was that a well-managed company should be able to manage those blocks of business in the fashion indicated. The factors that are used are for the low-risk business, 0.5%; medium risk, 1%; high risk, 2%. These factors assume an unqualified actuarial opinion. If you have a qualified actuarial opinion, there's a small bump to those factors. It's impossible to tell the mix of business going into this ratio, but you can see that for some companies, even if all of their business was higher risk, it would have had higher factors and that was clear from the earlier analysis. But this gives you some feel for the results.

## Ratio 3

C-3 RBC Results for 2000		
Ratio 3 (CFST Business) (CFST C-3 RBC)/(CFST Reserves)		
<u>0%-.5%</u>	<u>.5%-1.0%</u>	<u>1.0%-1.5%</u>
32	11	2
<u>1.5%-2.0%</u>	<u>2.14%</u>	<u>2.53%</u>
1	1	1

One of the things that I learned from my preparations for this presentation is that there isn't complete understanding of the actuarial certification requirement. Like most actuarial regulatory endeavors, there's a required actuarial certification. In this case, the appointed actuary is asked to opine as to whether the assumptions are not unreasonable for the products, scenarios and purpose being tested. It's not an opinion as to the reasonableness, but an opinion that the assumptions are not unreasonable.

That was done because when you're dealing with RBC, you're dealing with events far off into the distribution of events. And, in many cases, the kinds of scenarios you're testing and events you're considering are very rare. They may not even have occurred, so it's very difficult to say that things are reasonable. It's easier to say that they're not unreasonable. And hence the somewhat peculiar nature of the language.

An item confusing to some people is the requirement concerning the assumptions to use. The idea is that since we're dealing with events far off into the distribution, your assumptions should be consistent with the assumptions you use for cash-flow testing for reserve purposes, but not necessarily the same. Unfortunately, the words that try to communicate that idea are not as clear as they could have been. This problem has been addressed for the year-end 2001 instructions. If you compare the instructions that I distributed versus the instructions that will be provided for year-end 2001, you'll see that in a few cases where the word "same" is used it's been replaced with the phrase "consistent with." Also there's a little bit more explanation behind the concept.

As I said before, this project was not warmly endorsed by many regulators. People without an actuarial background tend to focus strictly on credit risk and really don't

think much about interest rate risk. So there was a battle not only with industry, but also with regulators to keep this project moving. One issue was that by moving away from a formulaic approach, the results are not uniform from company to company. It's not a "one size fits all," but more of a customized RBC. And it's not based on annual statement information anymore, but internal modeling results.

Another regulatory issue was over the number of opinions we're requesting. I'm sure that's a concern for companies. From the regulatory side, we have probably five or six different opinions to look at: your normal reserve adequacy opinion, either the Section 7 or Section 8 variety, a XXX factor opinion, an opinion for equity indexed annuities, and an opinion for guaranteed separate account products. Any one company may have to submit four or five opinions. It would be nice if we had a more holistic approach, the approach as suggested by the proponents of the unified valuation system idea.

As a practical matter, whenever we get an opinion, we like to review the supporting memorandum. The question is, how do you choose the memorandums to review? Do you look at the companies that have already scored high relative to the factor-based RBC, the four or five companies that had RBC on a cash-flow scenario testing greater than what would be on the factor basis, or do you focus on the companies that report zero as the C-3 RBC? So we have that practical issue to deal with.

Should we allow insurers to voluntarily do cash-flow scenario testing? This was the issue I talked about before. I'm not sure how this question is going to play out. I think that as regulators get more confident in the process, there may be a movement to allow companies to voluntarily calculate C-3 RBC on a modeling basis. However, it actually may backfire for insurers in the sense that if a company has the option to do cash-flow scenario testing for RBC versus using a factor-based approach, and you look at the cash-flow scenario testing results and you see it's more favorable, well, that's the option you're going to use. Regulators understand that. The companies that choose the factor-based option may raise the suspicion level of regulators. Regulators may immediately focus in on the company that had the option and choose the factor-based approach. In effect, that may become an early warning test in and of itself.

Next, should we limit the lower and upper bounds to 0.5 and 2? I suspect that's going to take a little bit more experience and thought before we tackle that one.

Next steps. I already talked about one technical correction concerning the language on the certification. There may be a few other minor technical corrections that will be adopted in the near term. But the big project really is phase two, the use of modeling techniques for evaluating the RBC needs for variable annuities with guaranteed living and minimum death benefits.

One project not directly related to a C-3 project is a project to recognize within the RBC formula effective hedging of credit risk. As you know, about two years ago we introduced into the formula RBC for replication transactions. A replication

transaction is a transaction using derivative instruments in which the combination of the cash market instrument and a derivative replicates a different cash market instrument. You can take an investment-grade bond and make a junk bond out of it. RBC addresses that. That's only going in one direction, and now we're thinking about the other direction. If you have a below investment-grade bond and hedge the credit risk, should you somehow get RBC credit for that? That's the next major project on our agenda.

With that as an overview of the methodology changes, and their impact, I'll turn it over to Alastair who will now talk about the new requirements from a company standpoint.

MR. ALASTAIR G. LONGLEY-COOK: I'm going to walk you very briefly through the experience of one company I'm familiar with, but spend most of my time on the background and the next steps. As Larry said, I'm chairing the Life-Risk Based Capital Committee of the AAA, but for the last couple of years I've served on the subcommittee of the committee chaired by Rob Brown that developed the new methodology and parameters for C-3 calculations and is now working on, as he said, phase two. Because of this experience, I can provide a little background in terms of how we got here, why this is the way it is, and where we're going. I think this might be of more interest rather than plodding through the actual calculations.

These are the actual calculations of the company, so you can see how it actually works. The significance test, which Larry talked about, compares the size of the C-3 factor to the other ones in total without covariance to see if it's over 40%. For this company it was not and so they go onto the next test, which is the stress test. Larry already talked about this, so I won't spend much time on it. But, basically, you're stressing the C-3 factor by a total of 7.5 times or 6.5 plus the original amount. After applying the covariance adjustment, the resulting amount is compared to total adjusted capital to see if you have enough. In this case, the company did not and so they then needed to do the cash-flow scenario testing.

As Larry said, the way it works is that it's not voluntary. Either you qualify and have to do it, or you don't and you can't. Initially, their thinking was that either it would be voluntary or there would be fewer companies exempted so that we would get a broader spectrum of results. As you heard from Larry's summary, we only ended up with a few companies actually having to do this. So it's hard to tell how the full range of results would have looked if more companies had to do it. Here are some details on the scenario testing methodology.

- Scenarios – 50 scenarios produced from the interest-rate generator—a Microsoft Excel spreadsheet with instructions available on the NAIC web site (<http://www.naic.org/1products/finance/lrbc3/index.htm>) or at [www.barnert.com](http://www.barnert.com).
- Annual Statutory Surplus – For each scenario, the annual statutory surplus,  $S(t)$ , for each calendar year-end is equal to statutory assets less statutory liabilities for the portfolio.

- C-3 Measures – For each scenario, the C-3 measure is the most negative of the present values  $S(t) * pv(t)$ , where  $pv(t)$  is the accumulated discount factor for  $t$  years using the 105% of the after-tax one-year Treasury rates for that scenario.
- C-3 Requirement – The final C-3 requirement is calculated as the weighted average of a subset of the ranked scenario specific C-3 results. For the 50 scenario set, the C-3 results are multiplied by the following series of weights:

----- Weighting Table -----

Scenario Rank:	17	16	15	14	13	12	11	10	9	8	7	6	5
Weight:	.02	.04	.06	.08	.10	.12	.16	.12	.10	.08	.06	.04	.02

- The sum of these products is the C-3 requirement.

What does the company actually do? Some of you may be familiar with this and some of you may be just learning about the new methodology, but this company ran 50 scenarios. They have an option of running 50 scenarios or 12 scenarios with higher factors. They ran 50 scenarios produced by an interest rate generator that's in a Microsoft Excel spreadsheet with instructions. It's available on the NAIC Web site. This is probably the first instance where a spreadsheet embedded in a Web site has been part of a regulatory requirement.

Why 50 scenarios, where did they come from, and what is that all about? As Larry mentioned, one of the political issues here is that a lot of companies are either unable to run, say, 1,000 scenarios, or claim to be unable or don't want to spend the money to run 1,000 scenarios, so requiring every company to do that was just not feasible. So the task force started out with 200 scenarios, which gave a pretty good distribution of results and then kept chipping away at that to see how few you could run and still get a good feel for the tail.

Several different approaches were tried to reduce the number of scenarios. One approach you may have heard of is called low discrepancy point analysis. That method uses mathematical tools to scan the distribution and to choose points that are representative of the whole distribution, thereby reducing the number of scenarios down by often a factor of 10.

It turned out that when we did that for just a few scenarios in the tail, it did not produce very good results. Those of you who have tried that approach in other areas might be interested in that fact. After this dead-end, Mike Zurcher and some of his colleagues at Lincoln focused on this issue and produced some excellent research. They considered a whole collection of different investment portfolios—everything from barbells to concentrations in one area to whatever—and a whole

collection of different liability portfolios, GICs, and payout annuities, and ran different combinations of those to see which scenarios out of the 200 ended up in the tail.

It turned out to a large extent that the same 50 scenarios always ended up in the tail. The stressful scenarios weren't all of the "drop three percent and stay there" or "rise three percent and stay" variety. They were all over the lot. But they were pretty much the same 50, so that we were able to determine that if we just ran these 50 and compared it to what if we'd run all 200, the difference in the required surplus was minimal. That was the approach that we ended up with. The 12 scenarios set was selected in the same way, but with a little more margin.

I think it's a very interesting approach. A number of companies have picked it up as a useful way to stress their products or their reserves by using those bad scenarios rather than maybe running 1,000. The measure was the statutory surplus, the worst one in each calendar year discounted back. It's not just the final surplus, it's the worst case throughout the projection and then that is weighted. Because we had so few scenarios, we didn't want to just pick the 95<sup>th</sup> percentile, we picked a weighted average of several percentiles. The reason that it's weighted around 11 and grading off is because, basically, you're selecting out of 200 scenarios, and normalizing it to the 100 worst. This ends up being representative of clustering around the 95<sup>th</sup> percentile, giving you almost a conditional best estimate of where are you in that tail, rather than just exactly at the 95<sup>th</sup> percentile.

Again, for this particular company, it's interesting that the scenarios produced a requirement of \$34 million for C-3. The old factors would have produced \$198 million. So it's a significant reduction, but capped at 50%. They could have increased their surplus by \$99 million. They did not for other reasons. Again, there are all kinds of reasons why the actual results might not be indicative of the new methodology.

A couple of other comments that came out of this analysis may be of interest. It appears there's some confusion over whether variable accounts can be included in the scenario testing for annuities with fixed and variable fund options. They can't. But it's interesting that some companies and even, I've heard, one regulator was confused on that. I think it's because the Academy Task Force Report with its recommendations allowed you to include them, but this differed from the final rules adopted by the NAIC.

If you did that, obviously, that's a big advantage, because until we finish phase two we're not modeling stochastically the equity returns. A company might assume that the equity accounts will continue to grow at nine percent or some fairly high level. Well, that will cover a lot of sins on the fixed side. And so, in fact, this company, if they had done it that way, would have had zero required surplus for C-3, eliminating the variable accounts that came out where they did. The final instructions do make it clear, but some companies might have been working from the recommendation and not the final instructions. And so, if that's the case, you might want to double check that you did it right.

As I said, phase two, the project that the subcommittee's working on right now will incorporate equity risk issues. What you need to do to is set RBC for guaranteed minimum income benefits (GMIBs) and guaranteed minimum death benefits (GMDBs), and you've got to model both. The particularly difficult thing about GMIBs is that you've got to model equity returns stochastically, but you also have to model interest rates at the same time. If you get out and have a bad equity return that triggers the GMIB, then you've got to know what is your interest spread at that point. This is because the rates are guaranteed and do you have enough spread at that time to cover that guarantee, unless you've hedged it all along. That is a risk, so you need to look at both equity returns and interest rates.

We're wrestling with how to structure the regulation. In phase one we basically came up with an interest rate generator that you have to use. It's there on the Web site. You can vary other assumptions, but that is a given and everybody seemed to feel pretty comfortable with that. It's a good, robust model originally derived by Joe Dunn at Metropolitan. It's a good two-factor model and it works pretty well.

When you get to equity models, there's a lot of controversy and discussion around what makes for a good equity model. One of the most important things is to not just use some lognormal distribution, because you don't get fat enough tails. And so then you say, "Well, do you try a stable Paretian distribution? Do you use Regime shifting models? Do you use some other approach?" And so what we're working on is saying you can use whatever model you want, but it's got to meet certain requirements as far as how fat the tails are and how well it matches the results of the funds that you are, in fact, covering in your portfolio.

That's a much bigger task, and I think this will apply to a lot more companies than phase one. Here you're talking about companies that have gone into writing these guarantees in a big way and it may be a substantial part of their portfolio. The risk might be substantial as well, so I don't think we'll be just seeing 48 companies, I think we'll be seeing quite a few. But how that all gets done is important.

One of the other considerations is how you combine the risks. With phase one we're just talking about interest rate risk and so you just have one model. You may be thinking about policyholder behavior as another variable. But as far as market risk, that's it. When you have equities and interest rates, some companies have one distribution for one risk, one for the other, and then have some kind of covariance matrix to combine them. That may be an approach that works, but be warned that when you get into the tails it tends not to work. Covariance is changed when you get into the tails. They are not stable. And that was one of the issues that caused the demise of long-term capital management, well-documented in the book, *When Genius Failed*, which I recommend. It's very well written.

As it says at one point in there, all the covariances went to one. And so assuming a stable covariance matrix and two independent distributions linked only by that usually does not work in the tails. Another approach is to have models that link the interest rates and equities inherently in the model to make sure they're internally

consistent. That would certainly be the approach I'd recommend you follow when you actually do that kind of risk analysis.

MR. CHRISTOPHER J. FOOTE: Perhaps you saw last week's news about the Leaning Tower of Pisa. The tower was reopened after several years of construction to shore it up and prevent it from falling over. You're probably thinking, at this point, what does this have to do with the C-3?

According to the news story, the engineers that worked on the construction had built a model to test other engineering solutions. What caught my attention on the story, however, was a quote from the lead engineer. The tower had been so perilously close to falling over, that according to the engineer, " We couldn't keep it from falling over in our model." My reaction to this was that the engineer really believed in his model. In fact, it seemed like he wanted the tower to fall over to validate this model. One of the questions that I want to ask Larry and Alastair is, do they feel the same way about the model? Personally, I think I understand the C-3 Model about as well I'd understand the engineering model that went behind the Leaning Tower of Pisa.

My objective today isn't to talk about the Leaning Tower of Pisa, nor is it to give these two folks a hard time. Indeed, today, I'd like to show the significance of the new C-3 requirements. I'd like to do that by discussing the capital management process at Consecos and the role played by RBC in this process. I'd also like to analyze the new C-3 results for one of the Consecos companies.

In this analysis, I'll compare the new C-3 with the old factor-based approach. I'll also try to give you a sense of the severity of the C-3 scenarios that produced the C-3 RBC amount. I'd also like to present some sensitivity tests to you. These will show some unexpected results as well as the potential volatility from changing interest rates that you might get in the future. And, last, I'd like to summarize the results and state a few of the implications for management.

First of all, I'd like to discuss the role of RBC in Consecos's capital management. Consecos owns both insurance and noninsurance companies. The insurance companies are organized under a holding company structure. And in this structure the parent corporation owns the insurance holding company and this company then, in turn, owns 18 insurance subsidiaries.

One of the important functions of the insurance holding company is to allocate surplus to the subsidiaries. This process of allocation starts with surplus targets for each one of the companies. The surplus is reallocated among the subsidiaries by taking dividends up from the companies that are over target or are making capital contributions down to the companies that are under target. Surplus that is not needed by the insurance operations is held or brought to the holding company where it can then be divided up to the corporate parent.

Now the key for this at Consecos is that our surplus targets are based largely on statutory RBC. The targets are, typically, on the order of two to two-and-one-half

times the RBC. For purposes of this function, RBC is taken as the company action level RBC. I know that kind of goes against the regulatory purpose of the RBC, but, indeed, that's the process that's used at Conseco.

Now, of the 18 insurance subsidiaries, two were required to do the C-3 cash-flow testing last year. Therefore, the RBC developed by the new C-3 method now forms the basis for the surplus targets in these companies. Because the new C-3 method directly affects the surplus targets in these two companies, it ultimately affects the surplus that can be dividended up to the parent company. For that reason the new C-3 is very important to us.

Now for the remainder of this presentation, I will be focusing on the results from one of the two Conseco companies that were required to do the scenario-based C-3. Before turning to the results though, I'd like to give a quick summary of the business in the company. First, I'll note that 30% of the reserves in the company were not included in the C-3 tests. The business to be tested in this new C-3 calculation includes deferred annuities and single premium whole life, but it excludes other life insurance, equity indexed annuities, and most separate account business. The company I'm presenting has a significant block of equity-indexed annuities and that represents almost all the business that was excluded from the test.

Of the business tested, about three-quarters was single and flexible premium deferred annuities. The plans in this block are fairly generic deferred annuities with declining surrender charge scales and with very few special features such as persistency bonuses. Now the remaining blocks of business include a variety of other plans, including market-valued adjusted annuities, two tier, and a very small amount of single premium whole life.

Now I'd like to turn to last year's results. The new C-3 totaled \$41 million based on the scenario approach, which was about 0.89% of reserves. This compared favorably to the old factor-based approach where the C-3 would have been \$59 million or 1.27% of reserves. If you refer back to Larry's summary, these results are right in the middle of the pack of the 48 companies that were analyzed. Our new C-3 is 70% of the factor-based C-3, making this company one of the 11 that fell between half and three-quarters of the factor-based C-3. And that was Larry's ratio number two. Likewise, this company was one of the 11 whose C-3 was between one-half and one percent of reserves which was his ratio three.

Now at this point I'll mention that this particular Conseco company is domiciled in Illinois. I generally try not to get too emotionally involved with my numbers. But for the reason that I hope is obvious, I was very pleased at the way this comparison turned out. Larry, perhaps you won't have to take a closer look at this work.

Under the new basis for the C-3, the RBC ratio is 2.16. This ratio is in the target range used in our capital allocation process. The RBC on the factor basis would have been 1.97. Another way to look at this and, perhaps, a more appropriate way is that the scenario-based C-3 freed up \$36 million in statutory surplus in this company. And in the process in our company this is a reasonably significant amount

of capital to allocate or bring back up to the parent. Indeed, we got a benefit from the results this year, as did many companies.

The results in our testing were very typical of a deferred annuity block. Statutory losses occurred in the rising scenarios and resulted from realized capital losses taken on the asset sales needed to pay the surrenders. In total, statutory surplus turned negative at some point during 12 of the 50 scenarios. In other words, 12 of the 50 scenarios produced a non-zero C-3.

If you recall from Alastair's presentation in doing these calculations, you run the 50 scenario, and then for each scenario you take the most negative present value of statutory surplus. The most negative value of statutory surplus in the work that I'm doing is the C-3 result for a particular scenario. If you go back to his presentation, you take those 50 scenarios and you weight them and you do the final weighted average C-3. And so what I'm pointing out here is that 12 of our scenarios turned negative and they produced a positive C-3. The other 38 scenarios were never negative and so their C-3 for those particular scenarios was zero.

Now one of the things that I found interesting was the range of the results in the 12 scenarios that produced a non-zero C-3. The most severe scenario of the 50 produced a C-3 of 4.78% of reserves. The smallest scenario that turned negative, the twelfth worst produced a C-3 of 0.74% of reserves. As I mentioned, the scenarios ranked 13 through 50 produced a zero C-3.

Another aspect that I found interesting was the role that the weighting process plays in this scheme. The C-3 from the four worst scenarios averaged 3.41% of reserves. And, if you recall from Alastair's presentation, these four receive a weighting of zero. The final C-3 average is based on scenarios ranked five through 17. Further, the next eight scenarios, the fifth through twelfth worst, had a simple average C-3 of 1.52%. The weightings apply to these eight, plus the weightings applied to the next five, which were zero, produced the final C-3 average of 0.89% of reserves.

Now in the sensitivity tests that I did, this weighting procedure tends to temper the volatility of the C-3. It does this by throwing out the very worst scenarios, those ranked one through four, and giving small but increasing weights to the next most severe scenarios. Further, the floor C-3 is zero rather than allowing for a negative offset for those scenarios where statutory surplus stays positive.

Now in analyzing these results I was also interested in getting a feel for the severity of the 50 scenarios. And to do this I ran the C-3 models under the New York Seven scenarios. Two of the New York Seven produced non-zero C-3. And these were the pop up and the rise return scenarios. The rise return scenario produced a C-3 of 0.93% of reserves, which, coincidentally, was very close to the final reported C-3. The C-3 from the pop up scenario was 1.87% or a bit worse than the simple average of the eight scenarios that contributed to the final C-3.

Another way to get a sense of the severity of the scenarios is to look at the

Treasury yield curve. Here I've shown the five-year Treasury yield curve for the worst and the eighth worst scenarios (Chart 1). The rise return scenario from the New York Seven is also shown for reference purposes. The worst scenario in the 50 rises quickly by 300 basis points over the first five quarters. It reaches a peak of nearly 700 basis points in the fourth year of the projection.

I chose the eighth worst scenario here because its C-3 result is near the average of the eight non-zero scenarios that contributed to the C-3. This scenario is interesting, because it parallels the New York rise return scenario after a brief drop early in the projection. However, it continues to rise after the fifth year, as you can see, ultimately, reaching a maximum increase of 950 basis points in the sixth projection year. My take on the scenarios is that they are more severe than the New York Seven, yet still plausible. I wouldn't look at these and say that they're outrageous, however, as I said, they are more severe than the New York Seven.

I'd like to turn your attention to several of the sensitivity tests that I did and I want to discuss four of them. They are increasing excess lapses, decreasing excess lapses, borrowing, and increasing the Treasury yield curve. In the first test I increased the excess lapse function by 50%. This is a sensitivity test that we perform on a regular basis in cash-flow testing. As you might expect, this sensitivity test typically shows worse results in cash-flow testing under the New York Seven scenarios. But somewhat surprisingly to us, the same sensitivity test actually improved the C-3 results. This improvement was not significant. The C-3 went from 0.89% of reserves to 0.86%, but directionally it was contrary to expectations.

Table 1

### Summary of Sensitivity Test

	<b>Base C3</b>	<b>Increase Lapses</b>
C3 (\$ millions)	\$41.1	\$39.8
C3 as % reserves	0.89%	0.86%
RBC as Ratio	2.16	2.17

Now digging into the results, I found that this surprise was a consequence of the interaction in the models of the maximum lapse rate, the model caps and the overall lapse rate of 50%. In the base run, the majority of the C-3 scenarios reached this maximum lapse rate. In this sensitivity test the lapse rates did not change during these most severe periods. However, the lapse rates did increase prior to the most severe periods. The early surrenders created relatively small-realized capital losses and they avoided larger losses later on after the scenarios had reached their peak.

In total, the results improved under nine of the original 12 loss scenarios. This is interesting, too. The three scenarios with the higher C-3 were among the least severe of the loss scenarios. And in these scenarios the cap on the lapses did not

play such a significant role in the results.

In the next sensitivity test I reduced the excess lapses by 25%. This, too, is a sensitivity test that we perform on a regular basis in cash-flow testing. Of course, in cash-flow testing under the New York Seven, this test improves the results. Now here you see that the test did not change the overall C-3 results. At first glance this doesn't seem very consistent with either the first sensitivity test or with cash-flow testing. However, nothing really new happened in this test. The most severe C-3 scenarios got worse, just the opposite of the first sensitivity test.

Table 2

### Summary of Sensitivity Test

	<b>Base C3</b>	<b>Decrease Lapses</b>
C3 (\$ millions)	\$41.1	\$41.1
C3 as % reserves	0.89%	0.89%
RBC as Ratio	2.16	2.16

In the most severe scenarios the lapse rates still reached the maximum of 50% despite the reduction in the formula. However, the total realized capital gains were higher in these extreme scenarios because less of the business had lapsed off in the early years of the projection. The results in the severe scenario were offset by improvements in the moderately severe scenarios where the interaction with the maximum lapse rate was not so significant. In the end, the scenarios that deteriorated were exactly offset by those that improved.

Now the third test was a sensitivity test on borrowing. The investment strategy that we used was modified from that used as the first option to cover negative cash flows. The borrowing rate was the 90-day Treasury rate and borrowing was capped at 10% of assets. In other words, negative cash flows were covered by asset sales once borrowing reached 10%.

Table 3

### Summary of Sensitivity

	<b>Base C3</b>	<b>Borrow</b>
C3 (\$ millions)	\$41.1	\$51.0
C3 as % reserves	0.89%	1.10%
RBC as Ratio	2.16	2.07

This test was of interest not only because we have used this assumption in the past, but also because the RBC instructions makes specific mention of borrowing. The instructions call for the C-3 cash-flow scenario testing to use the same assumptions as used in cash-flow testing. Larry referred to that. The wording there

was to use the same assumptions as in cash-flow testing. And, of course, that's going to be changed to use different wording. But the instructions specifically call for using the same investment strategy assumption. However, there's one exception in the instruction that the actuary needs to make sure that any assumptions regarding borrowing are reasonable for the C-3 scenarios.

Turning to these results, I found that the C-3 actually increased under the borrowing assumption from 0.89% of reserves to 1.1%. Now given the experience of the excess lapse sensitivity, this result should not have been too surprising. But the concern expressed in the RBC instructions regarding the borrowing assumption certainly sets one up for the expectation that the results would be improved with borrowing.

Now the analysis of this sensitivity test showed considerable variation between the scenarios. The borrowing in the loss scenarios generally delayed asset sales rather than avoiding them, as can be the case when using the New York Seven scenarios. The realized capitals or losses under delayed sales were either higher or lower, depending on the subsequent movement in the Treasury yield curve. In other words, the borrowing did delay the sales. And relative to sales occurring without the delay, you could cause greater- or lesser-realized capital gains. The results in the individual scenarios were really all over the place. In the most severe loss scenarios, the interest rates rose early in the projection and continue to increase. The overall results, though, in this test then turned out to be significantly higher losses due to the borrowing assumption and the delay that that caused in the asset sales.

Now the last test was a test of sensitivity to higher Treasury rates. In this test, I increased the initial Treasury yield curve by a 100 basis points and then I regenerated the 50 scenarios. This was an attempt to show how the C-3 results would have looked last year had the Treasury yield curve raised 100 basis points just prior to the model start date. Now, unlike the first sensitivities, there was a little mystery in this test.

Table 4

#### Summary of Sensitivity Test

	<b>Base C3</b>	<b>Higher Initial T-Curve</b>
C3 (\$ millions)	\$41.1	\$130.0
C3 as % reserves	0.89%	2.80%
RBC as Ratio	2.16	1.54

Here the C-3 increased substantially from 0.89% of reserve to 2.8%. This change looks pretty reasonable in total. The assets were already under water at the start of the test and the 100 basis point change caused them to lose approximately five percent of their value. Ultimately, about 40% of this loss made its way back into the C-3. From that perspective these things seem to smell about right with this change.

Currently the C-3 is capped at two times the factor amount. If you go back to the formula, you don't cap the scenario C-3 itself. Indeed, in this test, working it through our results there would not have been a cap here. The C-3 for the business that was cash flow tested or scenario tested would have been worked out to be 2.8% of reserves. But if you put it into another perspective, an increase of this magnitude would have forced our old holding company to contribute \$180 million of capital into this company if it were to attempt to maintain the 2.16 target ratio. While I try not to get too emotional about my numbers, results like this would certainly hurt. And, indeed, I liken this to the Leaning Tower of Pisa falling over if we ended up with results like this.

In summary, the new C-3 requirements can have a significant affect on Conseco and, quite possibly, on other companies as well. At last year-end our company benefited from the lower C-3 under the new method. But, as Larry showed earlier, this was the case for the majority of companies that were required to do the testing.

The sensitivity test showed that the C-3 could behave in some unexpected ways, especially when compared to sensitivities under the New York Seven scenario. This behavior was traced back and related to the factors that caused it. The first reason was the severity of the C-3 scenarios. These scenarios are both more severe than the New York Seven, but yet they're still plausible.

Next, in these models we saw some model assumptions such as maximum lapse rates and limits on borrowing that interact with the scenarios. These assumptions come into play with the C-3 scenarios to a much greater degree than with the New York Seven scenarios or possibly even with a set of stochastic scenarios.

And, finally, the C-3 weighting formula played a role in the unexpected outcome. This formula does not fully weight the good with the bad. Instead of fully averaging all the scenarios as you would expect in averaging stochastic results, the C-3 caps the benefit from the good scenarios at zero, and so you get a little bit of play because of that.

Then the last sensitivity test also showed the potential volatility from the new C-3. After the numbers were worked through the formula, this test did not reach the limit of two times the factor-based C-3. Larry previously mentioned the considerations that went into the floor and ceiling limits. Here is an example where the ceiling would be important to a company. And so you also see from this test that the benefit that we realized last year may, indeed, reverse at some point in the future.

Now as for some of the implications, the first thing that occurs to me is that there's going to be pressure resulting from using the C-3 models. My experience last year was that the C-3 was not a lot of additional work beyond the cash-flow testing. And, perhaps, some of you did the work and had similar results. However, in the future the timing of completing the C-3 is going to be even more critical. It was

critical last year, but I expect that to be more so in the future, particularly in a rising interest rate scenario. And that will be important to us for capital planning purposes.

The other thing that's going to happen this year for us is that the models will get a good workout. We'll be working on getting updated C-3 factors throughout the year, so that when we make our capital allocations, the C-3 work is already completed. Typically, we do those in the fourth quarter, so the dividends up or the dividends down from the holding company can't be done after year-end. They have to be done and sometimes they need regulatory approval, so they get done by early December or November.

The other thing that we're going to see with the new C-3 is volatility. The natural response I think to volatility is to attempt to control it. And the more significant the volatility, the greater the need to manage it. Going beyond the pressures placed on the models, I think there's going to be some effort in companies such as ours and maybe other companies to attempt to manage the C-3 result or at least reduce its volatility. Some of these efforts may focus on investment decisions to improve the performance on the C-3 loss scenarios.

Another possibility for a company like Conseco would be to merge one of our life or health companies with the annuity companies that had to do the C-3 testing. In doing that, we would work to make the company exempt from the testing requirements, so that would put us back on the C-3 factor basis. That might be, ultimately, a temporary solution at best if the regulators catch up with us and tell us we can't do something like that.

MR. GORSKI: Chris, in going through your comments, you mentioned that you were surprised by some of your results. And I think you attributed the surprise to the cap of 50% on excess laps. Given the comments that I made concerning the ambiguity in the instructions as to assumptions, i.e. "same" versus "consistent," if the language had been such that it would call for consistent assumptions between what you use for cash-flow testing versus cash-flow scenario testing, would that cap have been the same or would you have thought about that differently?

MR. FOOTE: I think that's a good point. As I said, we're going to be giving our models a good workout this year. And to answer your question specifically, I don't think I can say yes or no. The 50% cap on the lapses has been around our models for quite some time. How it was developed and whether it's still appropriate should be reviewed.

The one thing that does happen though with that cap is that when you get to those severe scenarios and you reach that cap, you're typically at that 50% level for a couple years in a row. And if you do the math, you know very quickly that half, of half, of half gets you to a level of business that's pretty small at the end of one, or two years, or three years. And so removing that cap, indeed, may have some unexpected results. It may benefit our results because it would allow more lapses to occur in the first year. Even though I wouldn't attempt to answer that question based on the results, I'm not certain I'd be worried too much about removing it.

They are severe lapses no matter how you look at it, 50%, or 60%, or 70%. That's pretty severe.

MS. MARY K. CROWDER: I have a question regarding your opinion of the likelihood of expanding the requirement for the scenario testing to products beyond the single premium life and annuity. How soon is it likely? I'm primarily concerned about the whole life product.

MR. GORSKI: I suspect any movement in that direction is several years in the future. Right now the focus is on phase two and phase three and understanding what took place in phase one.

MR. LONGLEY-COOK: I can add to that. The reason why, say, universal life (UL) and whole life was not included was that the experience of the task force members and, frankly, my own experience with this at Aetna was that it's really hard to lose a lot of money in the tails. You've got so many other sources of profit, whereas, with annuities you only have one or two. When we were on various conference calls or meetings of the task force, it seemed like everybody on the call was saying the same thing, that in their experience with this kind of testing on whole life, UL, the problem didn't seem to be at the same level.

MR. GORSKI: Alastair, moving from a strict formula-based approach for RBC for regulatory purposes to a hybrid approach and introducing modeling into the work was a pretty big step for regulators. As Chair of the Academy Group, do you see that taking place in other areas or do you see this simply as applicable to interest rate risk and the equity issues and stopping at that point?

MR. LONGLEY-COOK: I think the task force is going to continue to recommend the scenario-testing approach and the use of judgment based on guidelines where we have to. Where we don't, I think the preference would be to use some kind of factor basis, some kind of more simplified approach, because it is a lot of work. It does require judgement and analysis of that judgement. It's a whole different way of dealing with the issue than what regulators and companies have been used to up to now. And there is, as I say, a lot of political pushback not just from the regulators, but also from the small or medium-sized companies with regard to the amount of work involved when you get into this.

In the case of interest rate risk, you really need to do this. Think back to before the end of last year. C-3 was purely a factor, so it really didn't matter whether you're matching your assets and liabilities or not. And that's clearly not adequate in today's world with the sophisticated products and investment strategies.

We're now looking, as you say, at the equity guarantees. And, again, there's no way you can measure that and know whether a company is hedging or controlling that risk without reflecting the actual assets and liabilities and the hedging. In other places, if we can get away with factors and that comes pretty close, then we're probably going to do that. But in these areas we clearly need to go beyond.

MR. FOOTE: I was surprised at the answer to your question about the UL testing. I was expecting that your answer would be that it was more difficult to develop a C-3 approach for UL. But rather, you said that it's hard to produce the C-3 result for UL. Maybe I'm not summarizing this correctly, but what I inferred from that was that you're saying that the offset that you might get from life business against the annuity was, specifically, not allowed. And that seems contrary to what you'd expect in an economic sense. Indeed, if life business has factors that would help mitigate the C-3 risk, wouldn't we want to reflect that in our testing?

MR. LONGLEY-COOK: You're asking if companies get credit for that?

MR. FOOTE: Yes.

MR. LONGLEY-COOK: I guess that could be argued. I think the approach we're taking with C-3 is to help the regulators identify those companies that are in serious risk of crashing and burning. We are less interested in giving credit than in finding the outliers.

As you mentioned, RBC has ended up being a yardstick by which companies measure and analyze capital and the rating agencies have their formulas and look to that, too. But the original and basic purpose of these factors is to help Larry and his counterparts in other states find out where companies are seriously exposed and to do something about that before it's too late.

With universal life, the experience, that's not the risk you need to worry about. There are other risks with life insurance you have to worry about. Clearly, mortality risk is one of them, but in terms of C-3 it didn't cause these catastrophic crash-and-burn scenarios that the regulators are worried about.

Chart 1

