

---

# 2003 VALUATION ACTUARY SUMPOSIUM

## September 11–12, 2003

### San Diego, California

## Session 37PD

### Risk-Based Capital

**Moderator:** ROBERT G. MEILANDER  
**Panelists:** CHARLES DANA TATRO  
ARNOLD GREENSPOON  
ROBERT G. MEILANDER

*Summary: This panel discussion provides an overview of the current risk-based capital (RBC) requirements for life insurers as well as insight into topical issues and potential changes to RBC. Topics open for discussion include a recap of RBC law and RBC calculation rules, modeling potential impact of alternative actions, the tax impact of the factors, stochastic capital requirements for variable products and the role of reinsurance and offshore solutions. At the conclusion, participants better understand RBC and potential future implications.*

**MR. ROBERT G. MEILANDER:** This is session 37PD, Risk-Based Capital. Before we get into our topics, please allow me to introduce our panel.

Dana Tatro is a consultant with Actuarial Strategies, Inc. in Bloomfield, Connecticut. Dana worked for a number of companies, including Monarch, Manulife, and Allmerica Financial, before signing on to his current position. He currently focuses on VA product development and valuation. From his past experience, he has insights to share on both the U.S. and Canadian RBC systems.

Arnold Greenspoon is assistant vice president and actuary with MONY in New York City. He has been there 13 years; prior to that time he spent a number of years with Equitable. Arnold is very active in industry activities and is a member of the Academy of Actuary's Life Capital Adequacy Subcommittee. He spearheads the current work on mezzanine loans for that group.

My name is Bob Meilander. I am vice president–corporate actuary at Northwestern Mutual. I have been with Northwestern for almost 30 years, and have spent the last seven in my current role. I am also a member of the Life Capital Adequacy Subcommittee and try to be an active participant in both the Academy's task force on C3 Phase II and the Academy's Variable Annuity Reserve Working Group.

Our agenda is as follows: I will discuss the statutory authority for RBC and the process used to change the requirements from time to time. Dana will cover what is going on with C3 Phase II. Arnold will cover a number of other topics that are currently being considered for change; I will help him out a bit with that. If everything works right, we should have some time left for questions and comments.

In order to make sure we cover the things you are interested in, I would like to run this session more like a workshop than a panel discussion. We'd like to be interactive, so if you have a question, a comment or, more importantly, an answer, please feel free to break in at any time.

Risk-based capital (RBC) calculations are required by the Risk-Based Capital for Insurers Model Act. This act went into effect in 1992 or 1993 for life and health companies and one year later for property and casualty companies. The purpose of the act is to require companies to measure their capital compared to a standard risk-based calculation of needed capital. The concept of the RBC part of the equation is to determine the minimum capitalization that is appropriate to a company's risks. Because of that, comparisons of RBC ratios that are well in excess of 100 percent are inappropriate. When the model act was introduced, it had a one-year phase-in. This gave companies an opportunity to prepare for making these calculations, as well as to adjust their balance sheets, if necessary.

The RBC Model Act is an accreditation requirement, and, as a result, it has been passed in all jurisdictions. There are three detailed formulas: one for life, one for health, and one for P&C. Each of those formulas is split into a number of risk areas. In the life formula, there's C-1 risk, or credit risk; C-2, pricing risk; C-3, interest rate risk; and C-4, which is other business risks.

An underlying assumption for all of these formulas is that companies are well managed. As a result, these factors are designed to cover variations in experience from expected. They're not designed to cover the cost of poor management; that's rather important in considering them.

The first formulas were developed to deal primarily with credit issues. They did cover other things, but credit issues were the hot topic of the time. There were concerns about junk bonds and mortgages and real estate due to a couple of significant defaults that took place about that time.

More recently, the focus has been on refinement of the other C areas, in particular, C-3. There was the C-3 Phase I project on fixed annuities, the current C-3 Phase II project on variable annuities, and in the future there will be a C-3 Phase III project, which will consider equity-indexed annuities.

The way changes in risk-based capital standards happen is both interesting and unique. The Risk-Based Capital for Insurers Model Act directs companies to use the formula adopted by the National Association of Insurance Commissioners (NAIC), so each company has to produce numbers based on formulas adopted by the NAIC. The NAIC has a task force with a number of working groups set up to maintain the formula, and the Academy has a similar structure to support the NAIC. I'll talk a bit more about those groups in a moment. Significantly, formula changes made by the NAIC task force do not require state action. As far as I know, this is about the only place in insurance regulation where that sort of thing happens. In other words, an action taken by the task force to change a formula or to change a factor becomes part of the RBC structure without any action by the states.

Changes and new ideas for risk-based capital consideration come from a number of areas. They can come from NAIC groups, from Academy groups, and from companies or interested parties. I've only been involved in this directly for about a year now, and, from what I've seen, it comes primarily from the NAIC groups. A working agenda is set each year in December. Proposals for work will come from each of the groups that work on the three formulas: life, health, and P&C. These proposals will then be prioritized and finalized by the RBC Task Force itself. They will set the agenda and determine what's hot for that particular year.

As far as the structure at the NAIC level is concerned, at the top is the RBC (E) Task Force. They direct all activities and report to the E Committee, which is the financial reporting group. There are separate working groups for each of the life, P&C, and health formulas, and currently there is an RBC Ad Hoc Working Group that is considering a recalibration of the RBC tests, as well as considering a P&C trend test. I understand that in the past there have been other ad hoc working groups as needed. In general, proposals that are going to work their way through this process start at the bottom and work their way up through the ranks, gaining approval at each level.

The Academy has a similar support structure. The Life Capital Adequacy Subcommittee deals with the life formula, a task force on health RBC deals with the health formula and a P&C Risk-Based Capital Committee deals with the P&C formula. Each of these groups reports to a different practice council, and, as a result, there is a Joint Risk-Based Capital Task Force reporting to the Financial Reporting Practice Council to help with coordination. Each of the committees working on the formulas sets up separate task forces as needed. The C-3 Task Force is a good example of that. These groups do an awful lot of the work in getting suggestions ready for consideration by the NAIC groups.

Changes happen from time to time, which tend to take a while to put in place. The NAIC has a contract with vendors to produce the diskette that is used in RBC calculations; that contract requires about a one-year lead-time. So, that means if you're going to have something done for January 1, 2005, it has to be adopted by the NAIC at the December 2003 meeting. Given a three-month exposure period, which seems reasonable, that has to be approved for exposure in September of 2003. This means that the various groups that work on a proposal have to have their work done before that.

Pertinent to this is the current state of the C-3 effort. The Academy's C3 Phase II recommendation will be presented to the Life Risk-Based Capital Working Group of the NAIC, probably this Sunday. That's happening almost as we speak. If the Working Group and its parent approve it for exposure, it would be exposed until December. If they approve it in December, then it would be put in place for the first of 2005.

Changes to the instructions aren't nearly as difficult, because the one-year lead-time at the NAIC level is not needed. This means that changes of this type can be adopted in March or perhaps as late as June and still be in place by the following year-end.

So, that's a brief look at where RBC requirements come from, why they're important, and how RBC requirements are changed. Now I'll turn this over to Dana, who will talk about C-3.

**MR. CHARLES DANA TATRO:** How many of you are familiar with or have at least read the proposal that is being put forth for C-3 risk on variable annuities? I see a few hands. How many of you have actually tried to model some of the C-3 proposal or model the Canadian proposal out there for variable annuities and guaranteed benefits? Only one or two.

I'm going to go over Phase I really briefly. It's been out there for a long time. Most people are familiar with it. So I'm not going to spend that much time with it. Then I want to touch upon the framework for Phase II. I'm sure you've all heard about what's in Phase II—the details that you're going to have to go through to model the benefits, what kind of requirements you're going to need, the models to use and things of that nature. But what I really want to talk about is the actual modeling issues that you may run into when you try to implement Phase II of the C-3 Work Group proposal.

I previously had the dubious honor of implementing the Canadian requirements for a U.S. company. So I've had a lot of experience in actually trying to implement these stochastic models in both the pricing and valuation atmosphere. I want to share with you some of my experiences and findings so that maybe you can have a heads-up when you're going through it on your own when this proposal is finally passed.

Phase I was implemented, as I said, a little while ago, and Phase I targeted asset/liability risk in general, not just interest-rate risk in fixed products. The work group developed about 200 scenarios. Out of those, they picked a subset in the scenarios to run through cash-flow models in order to determine the C-3 risk associated with fixed accounts. These scenarios were developed for both annuities and life insurance products.

Most of the companies were exempt from using the scenarios due to some exemption procedures. Mainly I think it was a materiality test and an exposure test. I believe Bob knows better than I do. They used tabular factors that people have used before, and there wasn't much new there. Non-exempt companies had to use the prescribed scenarios or could generate their own scenarios to analyze the C-3 risk component of their products. That's all I'm going to say about Phase I. We'll get into the integration of Phase I with Phase II later, but I have a feeling that most people heard of Phase I and are pretty familiar with it, and it didn't really have that big an impact on a lot of companies.

The current framework for Phase II now targets variable annuity guarantees, separate account guarantees on variable products, mainly guaranteed minimum death benefits (GMDBs), guaranteed minimum withdrawal benefits (GMWBs), guaranteed minimum accumulation benefits (GMABs), guaranteed minimum income benefits (GMIBs), and any other kind of fund benefit that companies are coming out with there. If you read the guideline, it appears to impact life insurance products with GMDBs, too. However, there's a point of contention where I believe the work group feels that it doesn't affect life insurance product with GMDBs, but when you read the regulations, it's not 100 percent clear on that point of view. So for now, I'm going to say it impacts life insurance with GMDBs. However, please bear in mind that I think in the practical application of it these products will be exempt.

It's very similar to the Canadian requirements that were put down in 2000 by Office of the Superintendent of Financial Institutions (OSFI). You have to model out all your benefit cash flows. You have to determine your contingent tail expectation (CTE) percentiles in order to come up with the value of your benefit. You then set your capital to the difference between your total balance sheet requirement, which is some CTE level and the reserves that you hold—very similar to what the Canadians did a few years ago.

So, under the framework, they use stochastic scenarios to evaluate these benefits. As I said, you must model all your product cash flows, which means that you could come up with a fee capital requirement, which is what I'm going to refer to it as, along with a benefit capital requirement. The fee capital requirement would basically be the difference between the fees that you're collecting and the expenses that you have layered into the product. In the down market scenarios, as a lot of variable annuity (VA) writers now know, you don't really collect enough off your products to support your expense infrastructure. Under this guideline in modeling

all of the cash flows from your products, you could theoretically have a product that has very little GMDB risk but would generate fee capital because the fees on the product are not enough to support your expense structure.

Currently, the required capital is going to be set at the 90th CTE. Is everyone familiar with CTEs? No? Okay. When you do a stochastic evaluation you generally run 1,000 to 2,000 scenarios, and for each scenario you come up with a result. You then rank those scenarios from worst to best or best to worst, however you want to rank them, and get your percentile result. As an example, the 90th percentile result of 1,000 scenarios would be your 900th scenario when you sort them from best to worst, and that result would be your 90th percentile event.

Those percentile events, since it's just one point in the distribution that you're looking at, can vary greatly from the 90th to the 91st percentile, the 89th to the 90th, and so on and so forth. You look at a distribution, especially one that models a benefit with a very fat tail. When I say fat tail I mean one that has benefit costs that really skyrocket when the market gets bad. When the market gets bad, the percentile measure can fluctuate quite a bit. That's why people have come up with this CTE measure. CTE is the conditional tail expectation, so the 90th CTE result would be the average of your 900th to your 1,000th scenario. It would be approximately a 95th percentile event if you had a pretty uniform distribution of results.

That formula doesn't hold when you have very fat tails because you have a lot of volatility out there, but in general, it's pretty close. So, the CTE measure is that average of the last tails. It helps dampen the volatility of looking at different return distributions, different fund distributions, that you have when you look at a CTE metric. The required capital is the difference between this 90th CTE event and the reserves that you're holding for the product. That difference is what would be your capital requirement, subject to gross up and subject to offsets that you have.

The work group is currently developing factors to use for the C-3 analysis, mainly for GMDB benefits. I do not think they are doing them for GMIB benefits. If a company chooses not to use the factors or cannot use the factors because their benefits do not conform to the way those factors were developed, you can perform the stochastic modeling on your own. We'll get into some modeling issues a little later.

When the work group first started modeling all the cash flows of the benefit, they looked at the traditional Guideline 34 reserve that's used for variable annuities, and they found when doing a stochastic projection that it was very difficult to incorporate Guideline 34 reserves into that projection. They got some results that didn't make intuitive sense. So, they decided to move to a different reserve basis, and this is one of the modeling issues that they found that people didn't run into in Canada, maybe because the reserve structure up there is different. So, they went to just using the cash surrender value as this working reserve and then started

developing more of an integrated capital and reserve approach where the reserve would actually be determined by the stochastic scenarios as well.

When Guideline 34 was being developed, the initial proposal actually required some stochastic modeling analysis of the reserve. Then they settled on the five asset classes with the drops in recoveries instead of going to stochastic modeling. The Guideline 34 reserve was supposed to approximate an 83-1/3 percentile result. Now they're saying that doesn't really work in this environment, the way that we're setting capital, and if we're going to be running stochastic models on the entire benefit anyway, maybe we should be looking at reserves on the entire stochastic distribution as well.

So, they put in the cash surrender value as a working reserve for when you're projecting out your benefit streams, and then you would look at the 60th to the 65th CTE measure for setting your reserves. Your capital would be the difference between that 90th CTE result and the 60th or 65 CTE result. Again, that's very similar to what they did in Canada where the total balance sheet requirement was set at the 95th CTE. The reserve is set between the 60th and the 80th CTE, and then your difference is your capital, depending on where your reserves fall. A few of the modeling issues that come up when you're doing this distribution are the assumptions that you use, mainly policyholder behavior assumptions. When you run a stochastic model you have to make some future assumption as to what policyholders are going to do in different market environments. That can be very difficult to do, given the amount of experience that is out there for some of these benefits and for some of the products that are being issued. Some of the big policyholder behavior assumptions that you have to be concerned with are lapses, partial withdrawals, and fund allocations. There's a general thought that as benefits increase in the money, lapses should deteriorate.

However, with any kind of distribution or kind of product that you offer, you always know there will be a level of irrational lapses out there. People who have a large death benefit may still lapse their policy because a broker has convinced them that they should move the policy to another carrier in hopes of chasing higher fund returns or that they should move the policy to this product because it has this new benefit that they want. You always have this level of irrational lapses that you have to contend with, but then you also have to look at what happens if I have a death benefit out there that's worth \$150,000? My account value is now 50. Is that client really going to leave? So how much do I reduce those lapses when I do my modeling to get the true risk nature of this product?

Partial withdrawals are also another big issue. Dollar-for-dollar withdrawals on GMDBs, I'm sure everyone has heard that. It's been written up in a lot of different publications lately—the stories of a person who has that \$150,000 death benefit, \$50,000 contract value. He has a dollar-for-dollar for the withdrawal provision. What does he do? He takes out \$48,000. He leaves you with \$2,000, and he has a \$102,000 death benefit—a huge amount of exposure there for the company. But

how many people actually do that? How many companies have actually seen the anti-selective behavior on a widespread basis that would cause them to set assumptions so conservatively as to take benefits with dollar-for-dollar withdrawals and assume that both of their contract holders would do this? There are probably not too many of them out there, and I can think of three or four reasons why a client wouldn't do that, but I'm sure you have brokers out there that would do that. So, you need to make some provision for dollar-for-dollar withdrawals and the impact that would have on your valuation.

Fund allocation is also a big consideration. Do you assume people switch funds once they get in the money or once they get out of the money? Where do you assume they switch them to? How often do they switch them? Do you assume that they rebalance? How often do they rebalance? All these factors can significantly impact the results in your stochastic valuation, and, as you test and go through these different assumptions, you're going to find that, depending on where you send them, you can come up with a very large capital requirement or a much more modest capital requirement.

The other issue that you'll have to contend with is that these assumptions quite possibly could be different for both in-force and new contracts. When you're pricing a new contract, you may assume a different withdrawal utilization, different in-the-money factors, and different parameters for your policyholder behavior than what you would on in-force contracts. You're going to have to contend with those differences when you try to validate your pricing results with your valuation results—lining up the models, doing your cash-flow testing, doing your business planning. All these things need to be validated. Make sure that the relationships between the assumptions are reasonable, which could be a big undertaking for companies to do.

The next modeling issue when you're dealing with variable funds is how many are you going to offer or model? If you have a variable annuity that offers 62 funds—and I think most of them do nowadays—how many of those funds are you going to model? What asset classes are you going to put them in? What indices should you choose to model those asset classes with? It can become a very big project to determine that. Most companies that I've seen model about eight different asset classes, and they bucket their variable funds into those different asset classes. They'll have an equity fund, usually a world fund, an international fund, balanced, fixed, a conservative fund of some kind, maybe a money market and bond fund, and maybe a small cap fund since the small caps do exhibit some higher volatility than some of the other broader based equity funds that are out there. But typically it's about eight that the companies I've seen work with, and then you have to find the right indices to put them in.

So you have to benchmark your funds to the right indices, which means you may have to work with your money managers and your investment department in order to come up with the right benchmarking. You're going to have to find indices that

have credible historical data and track that data so that you can come up with the parameters for your model. You have to make sure you can justify the allocation to auditors, regulators, and senior management.

The other question with variable funds is do you rebalance between them? Do you assume that your contract holder does the rebalancing? The other big issue is correlation among funds. How much correlation do you assume? There are theories out there that a lot of funds are uncorrelated when they're in a stable market environment, but when you get into a very volatile market environment, funds tend to exhibit very positive correlation. As we've all seen, in the last couple of years when the equity market dropped, everything dropped. Correlations that were typically thought to be negative became somewhat positive. You will need to reflect that in your results too. You want to be careful when you're looking at tail scenarios—where things are assumed to go very poorly—that you're not over-recognizing the benefits of correlation.

Some other less theoretical issues would be with your new business and your pricing models. A lot of the models out there that companies are using don't do stochastic runs. There are a few new ones out there. I'm sure you can talk to many of the vendors about the new products out there that will do stochastic analysis of new business. A lot that people are doing do not. So, you may need to modify existing models or you may need to purchase a new model in order to handle the new capital requirements to run the stochastic models. You may either have one or two models. You may have a separate stochastic model that generates the actual stochastic projection. Then you may have to feed that into a model, or you may have an integrated model that does it all on the fly. It's really a preference on your part. Personally, I like two separate models because that way I can use the generator for other things and do stuff off-line rather than running the full pricing model. I can get results better.

The new models that you put in may be called upon to provide more information than what you were used to in both the new business and the valuation. When you do your new business planning, these models may have to be more robust in terms of the cash flows that you're producing. You may have to make sure that the way you're taking out fees, the way that you're assessing withdrawals, and the way you're assessing lapses are more in line with what actually happens on your book of business, which is something that a lot of people don't pay attention to when they're pricing the product. If it's close enough, they feel that's okay, and for most pricing it is. But now, if you're actually using this model to do a capital run to determine what your capital allocation is going to be for new business, or you can do business planning next year, those little differences between reality in your pricing model may no longer be acceptable. You're going to need to determine the impact of those differences and make some assumptions there to get it more in line with what the actual practice is.

Valuation models are kind of the same thing. I don't know how many of the current valuation models out there will actually run stochastic scenarios through them. I don't know how many of them could use the factors, if you're using the factor approach to apply the factor to your valuation model to come up with a capital figure. So these models are going to need to be updated. Run time will increase if you're using the stochastic side of things and you're running 2,000 scenarios over 100,000 different policies that you're valuing. It can become quite cumbersome and take a lot of time to do. You will need to update your model to handle that.

You may find the factor approach isn't practical for the valuation side of things. As contracts move in and out of the money, fund distributions change and age. You have a spousal re-registration or some other contract provision that the client takes advantage of. The factor approach may not be suitable for use in a valuation system. You may have to do something else. You have to modify the factors so that they represent the inforce distribution of your clients better so that you can actually come up with a good capital allocation.

How many people have heard about the calibration test for the stochastic models or know a lot about stochastic models? Only one. Anyone here familiar with lognormal models? Regime-switching lognormal models? There are some head nods over here. That's good.

There is a calibration test that you have to use if you're going to run your own stochastic scenarios for use with a C-3 analysis. The calibration is very similar to what they did in Canada. The one difference is that the calibration in the United States does both the good and the bad side of the tails. In Canada, they just did the bad, mainly because in Canada they didn't have any benefits that paid off during the good market environments like we do here, mostly the enhanced death benefits. The calibration is on a one-, three-, and five-year accumulation test, I believe, and it sets it for different percentile levels.

When you run your distribution using the Standard & Poor's (S&P) 500, the calibration is strictly on the S&P 500. Your model needs to produce accumulation factors on a one-, three-, and five-year basis that either match or turn out worse than the accumulation factors that are given in this calibration test. The calibration factors were developed using the regime-switching lognormal model with two regimes. That's a model that was developed by Mary Hardy and the University of Waterloo. It was the one that was used by OSFI in Canada to determine their capital requirement as well.

Basically, this model looks just like an independent lognormal model, except instead of using just one mean and standard deviation or one mean and volatility as inputs into the model, you have two. That's why they say there are two regimes. Your first regime is this stable state, general regime that you're in most of the time. Your second regime is a really bad regime, and you jump between regimes based

on the probability of switching regimes that you determine by coming up with the probability distribution function (PDF) of the fund distribution that you're analyzing.

That's really the difference. This regime-switching lognormal model that they do, because it has these two regimes that it jumps between, really captures the volatility bunching, significant kurtosis, which is fatness of the tail, and other attributes of the current market and the equity markets that we've seen over the past couple of years. You compare that distribution, for example, just a lognormal distribution or an independent lognormal distribution, and what you get is much fatter tails and kind of a flatter point underneath the curve. When you're going to try to use an independent lognormal model and calibrate it, more than likely you're going to have to increase the volatility in your model to get the fatness of that tail. As you artificially increase those parameters, you're going to skew the underlying distribution or the bulk of the distribution that you get from the model because the independent lognormal model was not meant to capture those different attributes that I talked about before, mainly the volatility bunching and kurtosis.

So, even though the work group has not come out and said that we have a preferred stochastic model that you use or we are requiring you use this model, if you want a model that's easy to calibrate against these tests, I would recommend using the regime-switching lognormal model with two regimes. That paper is published; you can get it off the SOA Web site. I think it was also published in the *North American Actuarial Journal* a few years ago. It shows all the nice statistical formulas, which I'm sure everyone is very familiar with, in order to come up with the right density function and then taking the maximum likelihood function of that density function in order to get the parameters that you need for the regime-switching lognormal model.

Those were some of the modeling implications that I saw. It's huge on product development, especially for companies that are constrained by capital or have written a lot of new business, and are in a high-growth situation where capital is at a premium, before variable products, very little capital requirements for guarantees. It didn't put much of an impact on your business planning. Now it's going to have a significant impact as these capital requirements are put into place, because, depending on the benefit and the provisions that you have in that benefit, the capital can be quite significant.

Capital allocation among related entities: If you're in a holding type company structure, and you write VAs out of one subsidiary, and that subsidiary is thinly capitalized, and you send money down whenever you can in order to keep it at the capital ratios that keep the regulators out of there, these new capital requirements are going to require putting a lot more capital in that subsidiary. That will make it harder to dividend money out as you run into dividend restrictions, and you may run into problems with that type of structure in order to move capital around among your related entities.

Profit targets: Many companies have one or two profit targets that they look at for all of their products. There's talk about risk-adjusted profit targets. I don't know how many people have been working with those, but you may need to change your profit criteria depending on how much capital you allocate to the product and the risk profile of that product.

Risk management: A lot of people have been talking about enterprise risk management. With these new capital requirements and the more robust stochastic modeling that's coming in, I think this can be a good tool for risk managers out there to be able to quantify the risk associated with variable products and other life insurance products.

If you have the stochastic tools already and you're trying to do some enterprise risk management, there's no reason why you just have to use the stochastic model in the VAs. You could use them on your variable universal life (VULs) as well with secondary guarantees or any type of product out there that is strictly asset-based fees, assessed on a variable account in order to put some quantification of the risk associated with those products. I think it can be a good tool for companies that are heavily into enterprise risk management.

This concludes my remarks on the second phase of the C-3 Work Group. Hopefully everyone has a little bit more insight on some modeling issues that are going to come up. I want to talk about the integration that's going on between Phase I and Phase II, because if you're an exempt company on Phase I, you may need to do some modeling under Phase II using the scenarios that were generated for Phase I.

This integration focuses on the risk associated with guaranteed fund options of variable annuities. Under the original Phase I proposal, fixed fund options under a variable annuity were excluded from the regulation unless some annuity was sold as fixed. If you have a one-year, fixed account on a product, you didn't have to worry about it under the old guideline. Now they're saying, "No, you really should start valuing this thing together with your C-3 risk on your equity portion of the model."

The reasons behind it, they say, are that the current Phase I factors might either overstate or understate the current capital position of a company. The factors they came up with are generic factors. They represent a kind of average. They don't really represent the true economic position that a company's portfolio is in. Depending on the nature of the assets you're holding in support of your liabilities, these factors may either overstate or understate the C-3 requirement. This integration is meant to capture the company's specific circumstances so that the two requirements can be in line with each other, and you can get a more robust risk profile and capital profile company.

If you're going to model your equity risks using stochastic scenarios under Phase II, they state that there are three acceptable methods you can use for the integration.

You can generate interest rate scenarios in accordance with the original Phase I proposal and assign them in rotation to your stochastic a priori scenarios. You can assume a fixed crediting rate, not less than the contract guarantees, calculate your C-3 Phase I values, assuming that this rate is credited. That's another way to do it. Or you can do a weighting, assuming that there are no assets allocated to your fixed funds, coming up with C-3. Then, assuming they're all allocated to your fixed funds, do your C-3, and then weight the two based on the actual percentages that are in your separate account and your fixed account.

If you're not modeling your equity risk and you're using factors, those last two approaches that I identified are the ones that you can use. You mainly assume a fixed crediting rate and calculate your C-3, or assume that you either have 100 percent in the fixed account or zero percent in the fixed account and weight the two together based on your proportion of fund distributions. That concludes my remarks.

**MR. ARNOLD N. GREENSPOON:** I'm figuring everybody is pretty much all Phase II'd out already. I'll touch on other projects in the works for RBC. There are a number of ongoing issues. The ones we are going to discuss are separate accounts that guarantee an index, modified coinsurance (modco) reinsurance, worker's comp, and mezzanine loans.

Separate accounts that guarantee an index: Presently, all you have to hold for C-1 is a flat factor of 0.4 percent of the assets. For C-3 you don't have to hold anything. It was assumed that companies writing these products know what they're doing. They must have very sophisticated hedging strategies to match their guarantees. Of course, none of our hedging strategies ever work perfectly. Upon some analysis, it was found that the present factor is probably inadequate in most cases. With the Long Term Capital Management situation, the regulators' confidence that the companies who employed these hedging strategies knew exactly what they're doing went away. I don't think there is any regulator who would like to see one of his or her companies go under because of this type of index guaranteed product.

There are actually two solutions proposed, and we'll talk about the tracking-error-type solutions first. For companies that are matching their liabilities by investing in similar type assets, or assets which they hope are similar, if you have a product that guarantees, for example, the S&P Index and you have an algorithm to invest in 20 assets that will match that index or a similar investment strategy, the risk you really have is tracking error. To what extent does your investment strategy not duplicate the index you have guaranteed? The RBC proposal is to calculate historically, over the latest 60 months of experience, to what extent you have failed to earn the guaranteed index. Then, you use 90 percent CTE, the same type of analysis that Dana was describing. The 90 percent CTE approach was chosen since the 95<sup>th</sup> percentile has always been the standard for RBC. All the various RBC factors have implicit in them a 95<sup>th</sup> percentile threshold. The 90 percent CTE approximates the 95<sup>th</sup> percentile, without ignoring the outlying scenarios beyond

the 95<sup>th</sup> percentile threshold. You calculate each month's experience relative to the index, rank them, and choose the worst 10 percent, which will probably be six or seven. You take an average of those and find out what your CTE risk is. Then you feed the result into a black box type formula, which was developed by the Academy, to calculate the appropriate C-1 and C-3 charge. The background to how this formula was developed and how it translates into an appropriate level of RBC can be found in the proposal on the Academy's Web site.

There are a number of issues outstanding here. It's a very complicated proposal, with many questions about what experience to use. What if you don't have 60 months of experience? What if your product is changing? What if your investment strategy is changing? I think it's going to take some time to resolve issues still under discussion. The regulators are hoping that this will be adopted in 2004, but there are a lot of issues still being worked out.

This is only one of the methodologies contained in the proposal. The other is for a company that doesn't try to match the index it is guaranteeing, but instead uses more of a general account type approach. It invests in the same general asset classes it would have in its general account, and then uses hedging strategies to convert that return into an index-type return. For that type of strategy, the Academy proposal suggests a different approach. The company would do asset/liability type modeling, similar to C-3 Phase I, and then use the results for both its C-1 and C-3 risk. Either way, these are complicated. The proposal is still in the development stage, and will create additional capital for companies writing these products.

Let's move onto modco reinsurance. When RBC was first developed, there was no recognition of modco reinsurance or funds withheld. The industry went to the regulators saying that if it no longer has the asset or interest rate risks on its books, because the performance of the assets has been transferred to the reinsurer, why should it have to hold capital for these risks? Changes were adopted in 1999, whereby ceding companies no longer hold capital for the assets performing for the reinsurer, and the reinsurer must hold the corresponding capital instead. This treatment is used both for modco and funds withheld.

When this was adopted, some parties may have naively thought this would not change the industry-wide capital since the ceding companies will be reducing capital and the reinsurers will be setting it up. Of course, when the RBC filings started coming in, lo and behold, these changes created significant reductions of capital. Some may have scratched their heads wondering what happened and whether or not the changes were appropriate. Of course, what really happened is most of the capital was going to offshore reinsurers.

The regulators decided to review the changes and see if there are any faults in what was adopted. They asked the Academy to look at a number of issues: the dividend

credit in capital, the bond size factor, concentration factor, and the whole issue of vanishing RBC.

The dividend credit in Total Adjusted Capital (TAC) works as follows: 50 percent of a company's dividend liability is treated as capital and included in TAC. If you have "modco-ed" your business to another company, including the responsibility to pay dividends, you should no longer get the credit for 50 percent of the dividend liability. Just like in true coinsurance, where the ceding company would take its dividend liability off its books, in modco it leaves it on its books, but it effectively takes it off the books. Therefore, it was felt that for a company that does modco and cedes its dividend liabilities, it should no longer get credit for 50 percent of the dividend liability in its capital. The Academy has made this proposal, which sounds fairly reasonable.

On the other hand, if you are a company that over the past couple years ceded business and received credit for the fact that the assets are no longer performing for you, and you didn't reduce your dividend liability credit because current rules didn't say you should, all of a sudden you are in a much worse position than you were at the time you did the deal.

There have been some complaints about this. Companies feel like they've been blindsided, and they are saying that rules shouldn't be changed in midstream. RBC has never had grandfathering. The rules have always changed in midstream, and companies have gotten blindsided, and now the question is being raised here: Should there be grandfathering?

Another issue is that companies feel this dividend liability is really not necessary and should always be treated as part of capital, and the capital being held for such products is highly redundant. It seems that much of this only applies to New York companies. There might be one or two more states, but in most states you don't have to cede in order to get reserve credit. In New York, the reinsurer does have to assume the dividends, and, therefore, this whole concept of ceding the dividend liability may be limited to New York companies or other companies that actually do cede dividends to the reinsurer. If the capital required is excessive, one possibility is to open the whole issue to a modeling process.

Next is the bond size factor, which the regulators asked us to look into. Under current rules, when you cede business to a reinsurer and the reinsurer shares in the performance of your bonds, both companies get credit for having the diversification of those bonds. This reduces the total required capital of the two companies. Let's use a simple example of two small companies. Each has, let us say, 100 bond issuers. If they would reinsure with each other, they would each have 200. There would be some overlap, but it's surprising how little the overlap might be. Let's consider the RBC charges for bonds. We all know that they vary by NAIC class and most people are under the impression that for Class 2 bonds, the after-tax RBC charge is 1.0 percent. But because of the size factor, if you only have 100 bonds,

your real charge is 1.9 percent, and if you have 200 bonds, your charge goes down to 1.45 percent. In short, in this example the parties could knock off about 25 percent of their bond charge through modco.

For many companies, required capital is dominated by this bond charge. Two companies, who for appropriate business reasons reinsure each other's business, are able to significantly reduce their required capital. The regulators asked if the present rules are appropriate, and the answer is yes, because there is a true diversification of the risk when this is done. But we should also view it as an opportunity that the combined capital of the companies may drop significantly. Even for larger companies, if you have a portfolio of 400 bonds, your factor is 1.225 percent. For 800 bonds, it's 1.063 percent. It's still a significant reduction of your capital charge for bonds, which companies can put into effect by appropriately reinsuring business with each other, or another similar arrangement.

We'll go on to the concentration factor. Under current rules, if you reinsure your business with another company, through modco or funds withheld, the business is still on your books. The concentration factor is based on the assets you own, even if they are performing for the reinsurer. We proposed a slight change here, that if an asset is primarily performing for a reinsurer, it should be transferred from the ceding company to the reinsurer for purposes of the concentration factor. I don't think it's a concern for too many companies. When this proposal was exposed at the June NAIC meeting, one of the big accounting firms published a summary of the meeting and said the following: When no one reinsurer receives more than 50 percent of an asset's performance, the C-1 risk should remain with the ceding company. In short, if a part of an asset, for example, 40 percent of an asset, now performs for the reinsurer, the asset risk stays with the ceding company. That's true *only* for the concentration factor. The accounting firm published a piece of paper that basically undid the whole RBC treatment of modco. There's no such thing. The change is only for the concentration factor.

Vanishing RBC: This is the big issue. As we know, the RBCs all disappeared into the ocean, and, of course, the regulators' concern is that matching capital is not being picked up by the reinsurers. There are two elements to this concern. One is that RBC is transferred to a U.S. company that is not booking it correctly, and there have been many instances of that. The answer, of course, is to do it right. The bigger issue is that most of this is going offshore, vanishing into the Bermuda Triangle. There are some concerns that maybe there should be a capital requirement for RBC going offshore. Some regulators have voiced this opinion. I'm sure this is something that will be an ongoing battle over the next couple years.

Worker's comp carve-out: There is a little history to this as well. Worker's comp liabilities are written by casualty companies, and the medical carve-out portion of this is usually ceded to life insurers. About 97 percent, I believe, of worker's comp liabilities are actually medical liabilities, and these are ceded to life insurers because it's more efficient for life insurers to hold these liabilities. We all remember the

multibillion-dollar losses in the Unicover Pool a couple years ago, and life companies suffered very significant losses. Some of the litigation is ongoing.

The regulators came along and said they wanted to know what was happening with this coverage. They created, effective in 2002, a special supplement to the annual statement for companies that write worker's comp carve-out, and charged the Academy to develop an RBC proposal for worker's comp carve-out. The Academy committee took the P&C treatment for worker's comp carve-out and adopted it for the life business. Now, the whole structure of RBC for P&C companies is very different than the life structure. It's dominated by the underwriting risk. The weightings of the different factors come out very differently. Nevertheless, we felt the most appropriate approach was to adopt the P&C treatment for the life companies somewhat simplified. The P&C factors are adjusted based on industry experience. They have premium factors and reserve factors adjusted every year. Then each company adjusts for its own experience. It was felt that this shouldn't apply on the life side. A somewhat simplified proposal was adopted, and it will cost some companies extra capital.

One last issue is mezzanine loans. A number of companies started writing mezzanine loans in the last few years, and it was an asset type that didn't quite fit into the regulatory structure. There was some question of whether they would be admitted assets altogether. When the regulators agreed that mezzanine loans are admitted assets, they asked that the RBC for these loans be looked into. If mezzanine loans carry higher risks than other mortgages, that risk should show up through the mortgage experience factor. This may take some time to work itself through, but in the long run, the higher risk will produce worse experience, and this will eventually lead to an appropriately high RBC.

Whether or not this is appropriate, whether it's more of a tail liability, which is not captured by the experience factor, has not yet been resolved. As data on these loans are not yet available in the statutory filings, this one's not getting resolved soon. But, again, the real way to resolve it would be that each company should incorporate it into its modeling for RBC.

Let me just conclude that there are a lot of issues on the table, but, in general, we're seeing a significant move away from formulaic RBC. Until now, filling out that RBC filing has been pretty much an accounting exercise: Here's what the factor is. Just multiply, and you get your result. Moving significantly away from that into actually modeling what the risks are and capturing the significant tail risks—that's where we are going with a lot of these proposals. Thank you.

**MR. MEILANDER:** The last active topic that we will discuss is long-term care. The structure has been working to develop new long-term-care requirements for quite some time. The current requirements are based largely on the corresponding requirements for disability insurance, because there just wasn't enough data to base long-term-care requirements on long-term-care experience. The new

requirements are to be based on long-term-care experience that's been developed from the experience reporting form that is part of the annual statement.

The LTC task force has been working on this for awhile. They've developed a model that is very much like the disability income (DI) model. And they've run scenarios. In short, they've done their testing and they've obtained tentative results. But they've gotten stalled on a few issues.

The first issue concerns the difference in results shown by size of company. For large companies, if they went with their proposal as it stands now, large companies would end up with a smaller RBC requirement than they have today. Small companies would end up with a requirement that is much larger. Some people feel that size doesn't matter. As a result, there's been a lot of discussion on how to deal with the differential. The data clearly shows that relationship, and yet the difference is so big that it seems that something else is going on.

A second issue that they've been concerned with is the formula itself. The DI formula is a percentage of premiums plus a percentage of claim reserves. The LTC group would like to make the LTC factors a function of incurred claims in addition to a percentage of premium plus a percentage of claim reserves. Some of us are concerned that that would lead to a very volatile risk-based capital requirement. The issue is still being debated.

Another question being asked is whether lower standards will be acceptable to regulators. As I noted, for large companies you'd end up with a smaller requirement. In the current environment, with the rate increases that have been taking place, it's questionable whether or not regulators are going to be willing to accept a smaller number.

The last question that still needs to be addressed is "Why are the results different for DI?" If you are comparing guaranteed renewable disability insurance and guaranteed renewable long-term care, why would the long-term-care numbers be lower? I think there may be answers for that, but that's something that's going to have to be answered.

I think we've covered everything that we intended to cover. We've talked a little bit about where risk-based capital comes from, how it's authorized, how it changes. We talked a lot about the new C-3 stuff that's coming down the pike. It's coming pretty fast, and it's something that you all ought to be aware of. And we talked a little bit about other projects that are in the works and other changes that might be coming in the near future. I'd like to turn it over to you and ask if there are any other areas that you'd like to talk about or any questions that you might have. If there are risk-based capital issues that you'd like to hear more on, feel free to bring that up. Are there any questions or comments?

**FROM THE FLOOR:** My concern is with C-3 Phase I. The tests used to qualify for exemption include certain kinds of business that are not included in the scenario testing if that is required. This causes problems.

**MR. MEILANDER:** That does seem odd. I don't know where that issue is going to go, but it has been discussed and the LCAS is aware of it.

**FROM THE FLOOR:** Why doesn't the NAIC give companies the option of doing the stochastic testing for C-3 Phase I if they want to do the work? For most companies this would lower RBC requirements.

**MR. MEILANDER:** That was a contentious issue. The NAIC—the Life RBC Task Force—didn't want to give a choice. They felt that they could not allow an option, so if a company passed the exemption test, it should not be allowed to do the testing. There's been some discussion about changing that, but it's not on the list of things that are currently under consideration for fixed annuities. C-3 Phase II is considering allowing the testing for guaranteed funds within variable annuities even if the company passes the exemption tests. Because of the combined nature of this testing, this may have implications for fixed annuities.

**FROM THE FLOOR:** I understand that C-3 Phase II will allow a choice between stochastic testing and the alternative factors. Isn't this inconsistent with Phase I?

**MR. GREENSPOON:** Let me comment on that. The Phase II factors are meant to be conservative and, in general, will produce higher results than actual testing. Although it's possible there will be cases that go the other way, the intent is that companies will benefit and get lower capital requirements through the testing. As far as Phase I, where testing is not optional, I think you have to address that to the regulators. They insisted it shouldn't be optional because they were afraid that companies would game the system. But now that Phase II gives the choice of using either factors or testing, it could be an opportunity to open up with the regulators the option to do Phase I testing. Also, when you choose either testing or factors for Phase II, you can't arbitrarily switch the following year.

**MR. MEILANDER:** So, there may be help. Any other comments or questions? Those were good ones. Thank you very much for your attention.