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DYNAMIC SOLVENCY TESTING (THE CANADIAN EXPERIENCE)

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While the profession in the United States is still grasping the pros and cons of dynamic solvency testing (DST), Canadian insurers have been under this regime for several years. Panelists will review the Canadian experience in adopting dynamic solvency testing and lessons learned. Topics include practical implementation issues, communicating with management and regulators, and the form of the actuarial opinion.

MR. J. HELMUT ENGELS: The purpose of this panel discussion is to give you some insights into how the DST process developed in Canada; how it evolved in the years it has been required; what issues have emerged since it was introduced; what the future direction is for DST. We will also give you some insights into the use of a DST type of process that is currently being developed in the U.K.

I was a charter member of the Canadian Institute of Actuaries Committee that developed DST. I ended up being its chairperson for a couple of years until last spring. Let me start this session by giving you a short summary of the regulatory environment which gave rise to DST.

In the mid-1980s, a couple of regional banks went insolvent. This was unheard of in Canada at this time, although we have seen several more since. The Canadian Institute of Actuaries decided to develop a process to help safeguard life insurance companies' solvency. The Solvency Standards committee was started, with the mandate to develop such a process, and the committee finally agreed on DST. Thus, DST was developed by the CIA as a professional requirement, and the CIA mandated that all appointed actuaries were to begin using it starting in 1992.

As it turned out, DST was not introduced in isolation, but was one part of a series of changes in financial reporting in Canada in 1992. That year, the revised Insurance Companies Act was passed by Parliament. It allowed the reserve methodology to be changed to the policy premium method (PPM). This revised method had been previously developed by the Canadian Institute of Actuaries, but it had been waiting for the legislation to be revised. The previous legislation included a definition of the reserve methodology to be used. The new legislation states that the reserves should be "in accordance with generally accepted actuarial practice." Under the new legislation, it is now up to the profession to decide on the appropriate reserving standards.

However, the regulator was concerned that reserves would be reduced by switching to the PPM reserve methodology. So, the regulator tied the acceptance of PPM to a package of

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changes to enhance solvency protection. The new insurance act allowed the regulator to require DST to be done, and the regulator promptly told all life insurance companies to do it. So the profession was requiring DST and the regulator also required it. The regulator also introduced minimum continuing capital and surplus requirements (MCCSR), which is the Canadian equivalent of the U.S. RBC requirements. So, in 1992, a whole package of changes in financial reporting came together.

Let me quickly summarize the DST requirements. The DST standard requires the appointed actuary to project the company's financial statement, including minimum capital requirements, for five years into the future. The base projection should be based on the company's business plan and best-guess assumptions and includes planned new business. The actuary then has to do several scenarios of adverse experience, starting with ten suggested scenarios and more testing of the key sensitivities. At the end of the five-year projection period, the valuation assumptions have to be changed to reflect the more adverse experience.

The purpose of the DST is not to determine a dollar amount of capital required to survive adverse experience. It is to tell management what the company is sensitive to. There is a lot of encouragement to test very adverse results to really understand what potential risks there are. The actuary then has to prepare a written report to the board and present his results to the board at least once a year. Presumably, he also reports to management, but again that's not mandated by the standards. It's just assumed that he is going to do that before he reports to the board. The report is confidential and absolutely not public in Canada. This was to allow the actuary to be very frank in his assessments of dangers to solvency in that he could realize it was a private report and no one else would see it. So that is a very quick description of the current standard.

At this point, I'd like to turn the discussion over to Dave Pelletier. Dave's a current member of the Solvency Standards Committee, and until recently he was a consulting actuary with Tillinghast in Toronto, where he did DST for several companies. He is currently with the RGA Life Reinsurance Company of Canada.

MR. A. DAVID PELLETIER: Helmut has taken us through the DST requirements, and a little bit about how DST has gotten to where it is today. As Helmut said, there was the approach in the existing standard of essentially taking a bunch of suggested scenarios, although some actuaries tended to look at them as being sort of required scenarios. Over a period of time, actuaries have begun to evolve in the ways they have worked within that standard. In fact, I'll go through how actuaries have performed within the standard and also the kinds of changes that are taking place in the standard, which reflects the emerging views of the actuaries.

Much of what I'm going to talk about is based on two surveys that were done of actuaries operating in Canada doing the DST. One was a very scientific formal survey done by the Solvency Committee about a year-and-a-half ago when Helmut was still in charge of the committee. We had responses from more than half the appointed actuaries in Canada doing DST work. The other was something I call an informal, unscientific, totally nonrandom survey representing about 15 companies, which I did by talking to people on the telephone and by seeing people before I did a CIA presentation on this subject in June of 1995. It is interesting to see just how the standard has evolved over time and how the new standard reflects the views of the practitioners.

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I will discuss how the audiences have reacted to the DST and by that I mean the people for whom DST is done; what impact DST has had on the way companies actually do their business at the end of the day; what changes we have made in the way the practitioners do DST; what changes would the practitioners suggest to the DST standard; and finally, the draft revised standard itself.

How have our audiences reacted to the DST? First, let me cover the boards of companies and management. On the good side, they have found it, in general, to be useful and helpful, and particularly, at the board level, it has been found to be very educational. I mean your experience is probably as well that many insurance company boards have people on them drawn from various walks of life and they don't really understand the insurance business that well. Or, you may also have people on the board who are drawn from the property/casualty background and don't understand life insurance that well. One tremendous benefit of the DST in Canada has been the fact that board members, sometimes for the first time, truly have a better feel for what the company is all about, what kinds of risks the company is undergoing and what sensitivity the company has to those risks.

It has also helped companies' management to identify the risks the companies underwrite and the sensitivities to those risks. For instance, what kind of mortality experience or what type of investments have to occur for them to drive us down to the point where our capital would not be sufficient to meet the Office of the Superintendent of Financial Institutions (OSFI) standard of 120% of the minimum continuing capital and surplus requirement? So DST helped quantify, in people's minds, much more vividly, what used to be sort of a vaguer notion. It has also helped in business planning, especially for capital needs. Much of the work done to develop the DST process is running business models out five years, and this has been very helpful for companies in doing other kinds of business planning, and understanding where their risk to capital might be.

That's some of the good stuff. On the other hand, there is also an awful lot of skepticism. I have heard board members from various companies calling DST "Doomsday Scenario Testing" or "Disaster Scenario Testing." Some people say a company's financial risks just couldn't be as bad as a DST shows. There was also a concern that some actuaries were running off doing these ten suggested scenarios, but in a lot of cases the work was really somewhat irrelevant. There were scenarios that didn't make that much difference to a company. Some of the board members didn't believe these scenarios were helpful in understanding what the company was all about. There was also a concern, in particular, on the part of some of the smaller companies, that perhaps are very big elsewhere in the world, for example in the U.S. or over in Europe. They perhaps had a very small Canadian operation. The time and effort involved in putting this thing together, they felt, far outweighed the benefits.

What has happened over time? One is that Confederation Life was a major insolvency, and all of a sudden many more board members became a little less skeptical about doomsday. Certain things do happen that can bring down a company. So all of a sudden there was much more awareness of the benefits of doing the sorts of things that let you understand where the risks might be. Another key thing that has happened is that the actuaries have tremendously improved the focus of the way they carry out the DST; they focus on what's relevant and what's material for the given company, rather than blathering on about ten scenarios, some of which don't make any sense for the given company. So

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it's the changes in the attitude of the board people, but also a change in the actuary and how he or she presents these results and carries out this process.

Now as Helmut said, due to the way the DST standard was originally written, the regulators would not see it. It was meant to be something for the board and management, but not necessarily for the regulator unless they asked for it. Following, about two years the OSFI decided to start asking for it automatically. But it is interesting that when I asked a number of the people across Canada how has the OSFI reacted to their DST, the answer usually is that they haven't. Either they haven't gotten around to it, or else they just didn't see a problem in a given company and didn't look at it. However, there was, in some cases, a great deal of interest expressed by the OSFI in some of the sensitivities shown. Some of the smaller companies, particularly those writing a narrow product range, showed a lot of sensitivity just because of minor changes in interest rates, or lapse rates on lapse-supported products. This certainly raised much attention at the OSFI, and has helped management and the OSFI work together to establish what sorts of things that company should be doing to help mitigate those risks.

It was interesting, as well, that the rating agencies apparently had not bothered to ask for it either, which again was a surprise. The tendency, unfortunately, is that all these rating agencies are American based. DST has not been a requirement in the U.S., and therefore, it did not occur to them to ask in Canada. Once DST does become more established in the U.S., I expect rating agencies will be more likely to ask for it in Canada. But it shows a very provincial attitude on their part. If this is a valuable tool to help management, and it is something they could ask for, why wouldn't they do it.

We also asked the doers what their reaction has been to this whole thing. One reaction was that it was huge amounts of work. As Helmut said, he was involved in implementing this thing in Manulife, a horrendous job for a company the size of Manulife, operating across so many countries all over the world, and so many different lines of business. You also had doers in very small companies, or very small branches, who were concerned about the kind of work they had to do. In a sense, it was perceived to be perhaps immaterial in the sense of the company as a whole across the world. But it is interesting as well that some of the doers were concerned about the number of shortcuts they were having to take to make the thing work. But at the end of the day they felt that the whole process had been worthwhile. Even if they had been taking shortcuts, they weren't really that material, and at the end of the day the results coming out of the process were results that, in general, were indicative of the kinds of risks the companies were under, and the results were meaningful and did provide useful information to management. So the reaction on the part of the doers has been a positive one.

Now the most important thing is what impact DST has had. It is not to be done as just an academic actuarial exercise but rather it should have some impact on the solvency of the company ideally, or management's understanding of the company, or what a company does. One of the impacts that companies have told us that they've had as a result of DST was an implementation of risk monitoring and control systems. It emerged that there were risks that they weren't always aware of. DST helped make them aware of those risks, and so they put more effort into monitoring certain early warning signs that could indicate where they should be acting on something.

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A second impact was change in investment mix, such as less commercial mortgage exposure. Sure that might have happened anyway, but as they ran through these scenarios, and looked at what would happen to the company under different kinds of environments over the next several years, some of them came to the conclusion that a change in investment mix could help diminish concerns they would otherwise have with respect to risks to solvency. More liquidity was also a change in investment mix strategy. Canadian companies have typically not been awfully worried about the area of liquidity. However, by looking at certain kinds of scenarios, they saw there could be potential issues, and as a result, in some cases, a decision was made to be a little more liquid. Some companies came to the conclusion that some of these interest guarantees, that they never really thought that hard about, turned out to be a risk. Using only logic would bring you to this conclusion anyway, but going through the mechanics of the DST process made it clear that, for instance, a 4% guarantee on daily interest accounts doesn't make much sense. It doesn't take much in the way of a bad scenario to discover that this can potentially cost real money. It was a way of understanding what the implications of that are and as a result there are less in the way of guarantees.

Given the company I am at now, which is the RGA Reinsurance Company, I was very glad to see that some companies have gone to make greater use of reinsurance in order to help limit the variability in their solvency ratios going forward. A number of people also had, in looking at the impact of proposed tax changes in Canada, discovered the best systems to use to actually model the impact of these proposed changes in taxes were the systems they had developed for DST purposes. In fact, this has been a great help to the industry as a whole right now. There is a big debate going on with the Department of Finance in Ottawa, which is proposing to change, fairly drastically, the way individual insurance is taxed. The use of these models has helped a lot in demonstrating to the Department of Finance the disastrous impact these changes would have on some companies, if in fact, over a period of time, they were to go in.

Another impact was the fact that many companies saw the need for improved asset/liability management processes, and as a result have made considerable improvements in that area. For some of the foreign companies operating in Canada, it became an easy tool for looking at the impact of capital repatriation. They used the DST to demonstrate to OSFI that, having run the DST and the scenarios, there is no problem in taking out some capital. It has helped in the whole process of bringing capital back out of Canada and still showing that solvency would not be in any way impaired. We are now seeing more focus on the use of target surplus in pricing and dividend setting. This whole DST process made companies and their boards and their pricing people just that much more aware of what could happen to surplus, and it emphasized the importance of maintaining the MCCR ratio at a proper level. As a result, there is more of a tendency now than there was before to directly reflect the cost of capital in pricing.

It is interesting that a few people commented that, in all of these things I've mentioned, it's not that the DST was the sole factor in doing any of these things, but in many cases what it did do was support what had been suspected earlier or maybe thought about, but not really quantified. DST helped to create a communications tool to help make a case for action. It made it very easy with these sorts of runs to see what impact different kinds of actions would have on a company. It made it easier for management to make decisions. The numbers maybe aren't always exact but at least it gives management a good indication of the direction that certain actions could take, or worse, if no action were taken it

shows what the implications are of simply doing nothing. A couple of people made the comment that there would always be a lot of skepticism about DST on the part of the marketing area, and they would say, "Ah, we'll just work our way through. We've always done it before," if certain scenarios didn't look all that good. But then you can go back to the marketing people and say, "OK, this may be a little extreme. You tell us what sort of assumptions you think are reasonable for say marketing area expenses. You tell us what you think is doable and you can do." So you could put those assumptions in the model and see if it still comes out with a bad result. So it helped the marketing people understand much more vividly some of the issues they had to deal with and how important action was to keep the company in a proper position.

So that was the impact we've had on companies as a result of DST. I'm going to talk about how this has changed over time, and what practitioners have done in carrying out DST. Initially, at the 1991 year-end, the emphasis was mainly on getting the mechanics right, taking some shortcuts, running the ten suggested scenarios just like it says in the standard, reporting on all of them, and giving all the information to the board. Over time it is interesting to see what has happened in the area of shortcuts. In some cases there are more rather than less. You began to realize very quickly, after the first year, that in some areas, there was very little sensitivity. Some scenarios just didn't matter. It didn't make sense to try to get the ninth decimal place right. It's better instead to focus on what was most relevant and what was most sensitive. So there was a clearer focusing on what's relevant rather than getting the ninth decimal place right.

There was also a move away from the suggested ten scenarios. I suspect there aren't many reports anymore in Canada that religiously show all of the ten scenarios. Instead, scenarios are specifically put together by the actuary dealing with a company's given situation, and perhaps going beyond the standard. The original ten suggested scenarios talked about 3% mortality change over a period of five years, changes in interest rates of so much, changes in lapse rates of so much, and so on. What you are seeing now instead are the actuaries looking at what makes sense in the context of their company, and ignoring, in some cases, what those original ten suggested scenarios were. They are doing something that gives management and the board a more plausible view as to what the risks are that the companies are undergoing. It's not a compliance exercise at all, but rather a useful management planning exercise.

It is interesting as well what actuaries have done to overcome the aspect of disaster scenario testing or the feelings of some board members who are skeptical of the results. What some companies have done is show good as well as bad scenarios. If you are going to show a bad scenario, such as if interest rates go the wrong way and lapses go the wrong way, then also show the optimistic one too, if it's at least as probable. This puts more of a sense of balance into the report, so that the board can see both sides—the possible risks and possible benefits.

There is more use also of what I call integrated scenarios. The original ten scenarios asked things like: What happens if mortality goes bad? What about expenses? What about interest and so on. Well, certainly for certain kinds of products, lapses and interest are clearly going to go together and so we should look at what kinds of things could happen in the environment and how that affects a whole bunch of different contingencies we deal with, rather than just one at a time. It is clearly the way that more actuaries have gone. As I said earlier, they are looking at this thing not as a compliance exercise, following the

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orders, but rather how they can write this thing in such a way that managers have a better understanding of what the risks are.

We also asked the actuaries what sort of suggestions they have for changes in the DST standard. There were three different types of views. The first was “Don’t make any changes at all. Leave us alone. We’re sick and tired of all the stuff coming out telling us what we have to do all the time. Just leave the standard the way it is. We’ve gotten used to it so don’t touch it.” There was a second bunch of people that said “It’s not precise enough. You need to be more exact. Give us a safe harbor. We need to know exactly what to do so we can follow orders just the way good actuaries should.” The third bunch essentially said this, “This has been a really good process but don’t get into the specifics. Let the appointed actuary use his judgment as to what makes sense instead. Get a focus on what the objectives of the process should be. Take a broader approach instead of using the ten suggested scenarios. Take a broader approach toward how scenarios should be developed and give examples as to how an actuary might do this to provide meaningful results, rather than giving orders as to precisely what you have to do.”

There was also a view as well that it was a process and results were important. I think Helmut is going to talk a little bit later about a move in Canada towards the possibility of actuaries signing off on a company’s financial condition, based on DST. Many people believed that what’s important should not be a signed opinion, but rather the process of examination—the results, rather than any kind of formal signed actuarial opinion are important.

We now have a draft revised standard that is being put together as part of the consolidated standards of practice that are promised now for the middle or end of 1996. The date continues to be moved back. At any rate, this part of the standard is fairly well put to bed.

Among other things, we have changed the name, calling it Dynamic Capital Adequacy Testing, rather than Dynamic Solvency Testing. The feeling was that Dynamic Capital Adequacy Testing was a little more descriptive of the process and was, in fact, what we are doing. We are looking forward, over a period of time, to see if there is enough capital to support the company’s business plan. The purpose, as is clearly laid out in the revised standard, is to identify plausible imminent threats to solvency, to identify actions that would lessen their likelihood or would negate those threats if they materialized. So it is clearly very much a broader approach with broader purposes, and not merely a compliance exercise.

What is the focus on scenarios? First of all there is a base scenario that would normally be consistent with the company’s business plan. In the revised standard there is far more emphasis on the development of appropriate company-specific adverse integrated scenarios. There are no longer ten suggested scenarios, but instead there is a great deal of text in the standard that talks about the process of going about setting and developing scenarios, rather than saying see Appendix A for the list of the suggested ten. Also, as you develop these integrated scenarios, you now look at the so-called ripple effects. An example of a scenario which is going into the educational notes would be: What if you have an economic recession? What does that do to interest rates? What does that do to stocks? What if you are holding a portfolio of commercial real estate? What does it do to the kinds of products you have? For instance, what if you are big into disability income. Where you have Term to 100 products, which are lapse supported, and interest rates are

dropping, what is that going to do to your lapse rates? So when taking a very integrated approach to DST, under a given economic scenario, you have to decide what are all the things that could happen to your company. So the new standard lays out that sort of process. You have to develop a number of these things to see just how well the company withstands that kind of environment. A key part of it is the communication in the resulting report of the effects, and the responses a company could make to those kinds of environments.

We list, in the standard, a number of possible adverse events that could be considered and this goes on for about three pages. It's not meant to list specific scenarios; it lists the kinds of things actuaries should consider. These include death rates, things like a medical breakthrough that could lower death rates, an epidemic that would increase death rates, sickness and accident rates. Suppose you have an epidemic that increases disability rates but not necessarily death rates. What kind of things could change? Could this hit lapse rates? As you know, in Canada, we have a bunch of policies that are very heavily lapse supported. What kinds of interest rate swings could we have? What level of asset deterioration? Could there be an effective run-on-the-bank scenario? There are any number of things like that that the actuary should at least be thinking about as he develops these economic scenarios and sees just what impact it would have on the company as a whole. It's not a very prescriptive approach, but rather one that says you need to consider the kinds of environments we could have, what would happen to the company, how do we react to it, and how can we plan ahead to minimize the negative impact.

MR. ENGELS: Now that Dave has told you about the experience of the last couple of years and the recent changes planned for the standard early next year, I want to talk about what seems to be on the horizon. Now that DST has been in place for four years in Canada, it has been accepted and all the companies are doing it fairly routinely now. People are stepping back and asking what else do we do with it, in addition to preparing the report to the board and management. Can we use it for other things? David mentioned earlier that the OSFI is now asking for it on a regular basis. The regulator seems to be regarding the DST as a very useful early warning tool, and they want to see it as soon as it is available. When the major rating agencies come into my company, we do share the DST results with them. We do it voluntarily because ours look fairly good, but they know that DST is out there and they will probably ask for it in future. Also our external auditors now require them regularly. They put them into their files, making sure that there are no surprises that the actuaries are telling management that they haven't seen yet.

Dave mentioned a more fundamental change that's happening in Canada with respect to the public opinion of the appointed actuary. This is quite controversial within the profession. Up to now, the DST has been a private internal report to management and to the board. The profession in Canada has again taken the lead in revising the public actuarial opinion. As part of the changes that I mentioned in 1992, they looked forward and said that by 1995 the appointed actuary in Canada will give an opinion on the company's future financial condition, as well as on the current year's reserves. The profession was to get a few years of experience and then the actuaries would start giving this revised opinion. This has now been delayed by two years, again because of much discomfort within the profession, especially on the property and casualty side which got into DST somewhat late.

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This changed opinion is supposed to be in the external published statements of the company—the glossy that goes out to policyholders and to the public. The actuary is supposed to say the following: “I have examined the company’s financial condition.” *Financial condition* is the code word for looking forward in time. It should not be the most recent valuation at the last year-end. If the company is reasonably healthy, or just healthy, the actuary’s opinion is also supposed to state the following: “In my opinion, the results of the valuation are appropriate and fairly presented in the financial statements and the company’s financial condition is satisfactory.” With this wording the appointed actuary will be publicly saying that the company will continue to be solvent going forward. What’s interesting is that this changed opinion is being required of the profession by the CIA. It is not required by the regulator, and it’s not required by insurance legislation. The statement and the requirement for the statement are contained in the CIA standard for practice of the appointed actuary of an insurance company.

There is a great deal of concern among appointed actuaries about giving this type of an opinion, especially as it is not required. It went through due process. It’s in the appointed actuary standard which started in 1992, but I don’t think many people really understood what they were going to have to sign. There is also a great deal of concern about exactly what is meant by satisfactory financial condition. Is the proposed wording right, or should there be a longer opinion, like a one-page description of the process that the actuaries went through. If you look at what the accountants put into our external statements, you see that their opinion is almost one-page long. Here we are looking at the actuarial opinion being about two sentences. The CIA has now appointed a new committee, made up of appointed actuaries, to look at this issue as well as other issues.

It seems obvious that the opinion on financial condition has to be based on the actuary’s DST work. In fact, the idea of having such an opinion originated because actuaries knew DST was coming. But DST is designed to involve sensitivity testing, with the expectation that a company is going to fail a couple of very serious scenarios. The idea is that you are supposed to test very serious types of scenarios just to see how bad they are, and in fact there was some opinion when we first set out the standard that maybe the standards should say, “Keep testing until you have driven the company into insolvency. We want to see just what it takes to do that.” So failing scenarios is fine under a DST standard, but this revised public opinion is basically a pass/fail statement. It’s not a statement describing the scenario testing that has been done.

The work involved in giving this revised statement, everyone thinks, is more than just the DST. Because the DST is basically quantitative work, the financial condition opinion should consider things like trends from the past, how the company is doing, the evolution of MCCR ratios, and so on. The actuaries are very leery about making comments on management competency or other things that you’d normally include in C-4 risk. No matter what they look at, the key part of it is going to be the DST work. There is some concern that when the DST is to be a large part of this financial condition opinion, the scenarios tested may be weakened just to ensure that the company doesn’t fail any. This will take away from the purpose and the worth of the DST as a solvency testing tool and a confidential reporting to the board.

You might wonder why the CIA is proposing this kind of opinion. This CIA has some guiding principles and the first one reads: “In carrying on its activities and programs, the institute holds the duty of the profession to the public above the needs of the profession

and its members.” In this case, the leadership of the profession is saying that it is for the public good that the appointed actuary of a company give a public opinion, not only that the company is solvent at the end of its last year-end, but that, in his opinion, it will continue to be solvent. It is also saying that it’s a public service for the actuary to publicly state that a company has solvency problems coming up and to protect the public by effectively stopping the sale of new business. If the actuary gives a qualified opinion in the glossy statement, the Annual Report, company sales will be greatly diminished. If the appointed actuary does not give a clean satisfactory financial condition opinion, the company is probably going to be out of business very soon. Thus, the appointed actuary, and not just the regulator, can in practice cause an insolvency. This revised opinion wouldn’t be possible if the DST didn’t exist as a process or wasn’t accepted fairly well.

Many people believe that the profession’s leadership is well ahead of the membership on this issue. My own opinion is that the profession is not going to back down from this requirement and the appointed actuaries are going to have to sign this revised opinion starting two years from now. One of the interesting things in Canada, under the Insurance legislation, is that there is a thing called qualified privilege. It’s a legal thing but, in essence, it says that if the actuary is doing what he is supposed to do as required under the act, he can’t be sued. So if he reports to the government regulators that there is something wrong with the solvency of the company, as he is required to do under the law, and that disclosure hurts the company, the company and its shareholders can’t sue the actuary. You can’t be sued for doing your job. This revised opinion would not be covered by that protection. The actuary would be out there in the open on this one.

There is another issue that is surfacing in Canada which is that the regulator has stated that the annual reports of insurance companies should have far more disclosure than is currently the case. It is not certain whether this would include disclosure of the DST work. It may, but we are in the early stages of this process.

Another thing that is coming in Canada is that the insurance legislation, which was changed in 1992, has to get looked at again every five years or so. It’s up for review in 1997. There have already been some Senate hearings that have taken place in Ottawa to obtain input on possible changes, and during some of these hearings there were representatives from the CIA who appeared and talked about what the CIA is doing for the insurance industry. In these preliminary hearings the members of the Senate Committee expressed some interest in extending the DST process to other deposit-taking institutions, such as banks and trust companies. Again it is still early in the process and we will have to see whether that actually finds its way into the legislation or not.

That’s a summary of the changes that I see affecting the DST going forward. I’ll finish up with some comments on the usefulness of the DST as a management tool. My own personal experience tells me it’s a lot of work to start the DST process in a company, especially a large company that’s multinational, as Dave said, which has almost autonomous operating divisions and has subsidiaries that were banks, and subsidiaries that were P&C companies. They all get led into this DST process, because you are looking at the company in total, but you find many other uses for it as you go on.

Once the process is in place, it’s amazing to see the number of people that find things that they’d like to get from it. For instance, in my own company, it ended up being used to look at the reexamination of our asset mix worldwide. Where should we be going in the

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future given the types of liabilities we have? What sort of mix should we have in what countries. It's also become an integral part of the annual planning process. In my company you wouldn't think of doing the annual planning process without doing the five-year projection first. In fact, it starts getting to be a sort of a teeter totter of do you do your five-year strategic planning first and your one-year plan has to fit into that, or do you do a detailed one-year plan and your five-year plan uses that as a base going forward. Interestingly enough, it ended up being a very useful tool when trying to comply with U.S. cash-flow testing requirements as well. This shouldn't be a surprise. If you are doing best-guess assumptions and you have models going forward of your assets and your liabilities, it should be the same on a Canadian basis as a U.S. basis for our U.S. block of business. So we ended up using the actual process, the models, and everything that we used for DST; we adapted them slightly and used them for cash-flow testing.

We also went through a reexamination of the company's overall strategy. We ended up hiring a consulting firm (not an actuarial consulting firm), and they were quite good and they looked at all the financials that we had. The first thing that they wanted to do was to use our DST from the previous year as the absolute base. They figured that was a trusted base and everything had to project off that and if anyone had something more optimistic than what they put in their DST last year, they had better explain what's happening. We ended up changing it a lot, but again everyone had to explain what was going on, and the DST process and the modeling was used for this. There are also parts of the DST process that are helping us to develop our methodology for implementing U.S. GAAP for mutual companies. Again, you are doing projections forward and using much of the DST work for that. So you may think of the DST as being a compliance requirement that came in, but it sort of has evolved into far more of a very useful management tool within companies.

I'd like to now introduce our next speaker, Professor Mary Hardy. She teaches actuarial science at the Heriot-Watt University in Edinburgh in the U.K. She is currently spending a year teaching at the University of Waterloo in Ontario. She is involved in research into solvency modeling in the U.K. and she is going to describe the current status of this work.

DR. MARY HARDY: I've been asked to talk about the current status of the DST debate in the United Kingdom. In a nutshell, DST is coming but is not in place yet. My research interest is modeling insurance company solvency. So, obviously I'm very interested in the debate.

Let me give some background on the U.K.'s introduction of DST. The current solvency standard is essentially that life companies have to perform a net premium valuation. There is a very simple fairly unsophisticated minimum solvency margin on top of that and the assets are taken at market values. These standards were set some time ago, basically under the principle of freedom with publicity, which means that the valuation is not necessarily a best estimate. The published valuation is not necessarily all that helpful to understanding the position of the company.

I want to make another point about the attitude of the British profession and the British Government and public toward insolvency, and basically there is zero tolerance. Our opinion is, I think, that any insolvency is fairly disastrous for the industry. It would be extremely embarrassing for the government. In the U.K., whenever a company loses money the opinion is that it's probably the government's fault. The people would be

somewhat unhappy with it. So there is no sense that a bad company should go down. We want complete solvency. There is zero tolerance of insolvency. We want to be able to identify risky companies early enough to avoid insolvency.

So in the U.K., we watched what was happening in Canada and decided that this was quite impressive. The process of Dynamic Solvency Testing was something that we could understand and that might help us in drawing up a more up-to-date solvency standard. The background to this was decreasing free asset ratios in the U.K. There has been, I think, a fairly relaxed attitude toward standards for solvency assessment in the U.K. until fairly recently because so many companies had very large free asset ratios and nobody could seriously contemplate these decreasing to dangerous levels. That's happening now, and the free-asset ratios are much smaller than they were a few years ago as a result of competitive pressure to maintain payouts in somewhat adverse investment circumstances. That has led to an increase in the number of companies, that are not at risk of insolvency, but are not looking anywhere near as comfortable on a very long-term basis as they once were. There's much more worry that there might be some vulnerability that was not there before.

Therefore, the Institute and Faculty of Actuaries established the Joint Actuarial Working Party (JAWP) on Dynamic Solvency Testing should they be required to prepare an annual financial condition report, that is, more or less the sort of report that the Canadians are talking about, and essentially an annual statement of the financial health of his or her company. If so, should such a financial condition report include the results of dynamic solvency tests, and who should see the financial condition report. Should we publish it, should it be made available regularly to the board and the supervisors, or should it be confidential within the company? The JAWP was asked to recommend details of dynamic solvency testing requirements. For example, what scenarios would be suggested or recommended or required. How long should the dynamic projections be? What should the projection period be? What would the base assumptions be? Should it be a pass/fail criteria? And, should the nature of each year's liability valuation be in the projection?

JAWP reported a year ago or so. General recommendations include that appointed actuaries should be required to carry out dynamic solvency testing, and this would certainly assist in the understanding of the processes and identify sources of vulnerability. The results of dynamic solvency testing should be presented in any financial condition report (FCR) by the appointed actuary and this would not normally be made available to the supervisors, but the supervisor can ask for it. The consequence is that the financial condition report will not cause the supervisor to intervene because they won't see it on a regular basis. If the supervisor is already worried about a company, they can ask for any information. They know that the FCR will exist. They can ask for it and therefore see the results of dynamic solvency testing.

The appointed actuary, of course, has an ongoing responsibility if the FCR or if the dynamic solvency testing shows that the company is in trouble. The appointed actuary has a responsibility to fix it or report it to the insurance supervisor in extreme circumstances. They kind of opted out of the DST recommendations, and all those questions about recommended scenarios and length of projection. U.K. actuaries, probably the same here, like to think that nobody knows their company, nobody knows their situation, better than they do and they really do not like to be told what to do. They were not going to be told

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what to do by the JAWP. So the JAWP recognized this and decided on no recommendations. They did come up with the conclusion that the five-year projection period that the Canadians use would probably be appropriate also for the U.K. There are no recommended scenarios. This is entirely at the appointed actuaries' discretion. I think that there may be problems with that approach, in the first place, although clearly the appointed actuary's discretion isn't important in any meaningful exercise.

You are interested in implementing DST in America, so perhaps I should say why things might be different for us, for those of you who don't know already. Most conventional life companies hold a large proportion of their assets in equity shares and stocks, and that makes them very vulnerable to market movements, particularly since the solvency standard involves the market value of assets. The nature of liabilities is also interesting. The nature of the dividend bonus payout is to increase the sum insured. For the payouts that you make now, the money actually doesn't leave the company until the policy matures. So it is possible in the long policy to make decisions now that are going to get you into trouble somewhere in the future. I think this has implications for the projection period for us and after some debate, I hope, that it will be seen that the five-year projection period, which is appropriate in Canada, is perhaps somewhat too short in the U.K. What this leads me to be concerned about is the projection period and the deterministic nature of dynamic solvency testing, and I will come back to that later.

What is the current status of DST in the U.K.? It's still being discussed. The joint actuarial working party has reported, and although it is not yet being required, it will be required soon. The companies know that. Many companies have already implemented it for their own purposes. The actuaries that I've talked to find it very useful in all the ways that the Canadians have told you it is going to be useful. But many companies also have found that it's not telling them the whole story, particularly in the U.K. context. A few large companies are implementing stochastic simulation, and stochastic dynamic solvency testing. The Prudential is heavily involved in this. They are finding this exciting and interesting and they are making big changes as a result of stochastic dynamic solvency testing of the company and of portions of the company. I think it's possible that the report on stochastic simulation of the company's assets and liabilities will be part of a financial condition report. However, that will be some way away.

I thought you might be interested in what is frightening U.K. insurers about this. What frightens them is how they are going to afford to implement this. Do we have people who can do this? Do we have the knowledge and the technology? This does not frighten the consultants who are rather pleased at the prospects. I find life office actuaries are always terrified of having to explain anything new to the board. So I am happy to go back and tell them that the boards in Canada have found this very helpful. They seem to be concerned that they must explain detailed techniques and if the board doesn't understand it, perhaps they shouldn't be doing it. Will the board be frightened, particularly if you show deterministic simulations that actually go insolvent? This seems likely to frighten more sensitive members of the board. Will we appear more insolvent than we are? Most actuaries feel that they have a good idea of how solvent their company is, that is, very solvent, and anything that indicates insolvency is going to worry them. This is not because they believe it, but because they believe it will constrain their future activities. I don't think any of these things are going to be enough to stop dynamic solvency testing coming in. Some of these, like knowledge of technology and communication, will be enough to make it difficult to introduce things like stochastic simulation.

One or two worries from the outside are that dynamic solvency testing may make offices even more complacent, particularly with only a five-year projection, when your current decisions could be affecting your solvency for 30 years. The fact that there are no recommended scenarios at all means that there could be a backwards argument that if you come up with a scenario that shows that you go insolvent, you have another look at the scenario and decide that must be impossible. You will always come up with the answer that you wanted to have, which is perhaps not that helpful in solvency assessment.

That leaves a fair amount of time, so I will stop there and any questions you have, I'm sure the Canadians will be better at answering how this works in practice. We also have the U.K. Government Actuary here, so if you have any questions that he might be able to answer, then we can hand it over to him.

MR. GLYN A. HOLTON: I was interested in the equity component in the British portfolios. It's something we don't really see in the Canadian risk analysis or the United States risk analysis. It is such a large component of volatility. Can you really make strong statements five years in the future if you have that significant a volatility component?

DR. HARDY: What you get is my personal opinion. I am not representing the Institute of Actuaries. I think what you can make, from five years onwards, are fairly strong probabilistic statements. This is why I think that the nature of the U.K. business means that really we should be simulating stochastically and looking at estimated probabilities, rather than believing that we have a meaningful best estimate of assets and liabilities five years in the future. The models that we have are not perfect and they are not particularly very helpful in the short term. But after five years, I am confident that we could get meaningful answers probabilistically.

MR. WILLIAM C. KOENIG: I am intrigued by the prospect that in Canada an actuary's signature and statement that his or her company is in financial difficulty might somehow improve that company's future situation. I wonder whether any of the panelists would care to hypothesize about what might have happened in Confederation's case if the actuary had the foresight back in 1992 or 1991 to state that the company was in some financial difficulty, had some weak investments, and so on, and whether in fact that would have deferred or speeded up the company's ultimate demise.

MR. ENGELS: I'll take a first crack at that question. Dave can also maybe answer. One of the things I would have loved to see was what the appointed actuary's report for Confederation Life said in 1992, the first year it was done. Again, it's all confidential. If you are an appointed actuary in Canada of a company that goes insolvent, you will go through the disciplinary process in Canada because the assumption is you did something wrong. Anything I've seen regarding Confederation Life that has been in the public press says that by 1992, it was already too late. A possible analogy is that it was like this big snowball coming down the hill and there was nothing that was going to stop it. They had made their mistakes before that. Hopefully, the DST tells what the dangers are and hopefully the companies won't get into that kind of a situation.

As far as the actuary putting a company out of business, again it was a push and pull. Does the actuary stay quiet and work with management, very quietly work with the regulators and can they pull the company back out? Can they muster up a rescue attempt or something like that? In the meantime, more policyholders are buying new policies.

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Policyholders who might have been able to get out can't; they are kept in the dark. Should the actuary, at the moment he thinks there is a kind of solvency danger for a company, publicly say that and give policyholders who haven't bought a policy with that company the choice of buying one or not, knowing what the real facts of the company are? Again, the actuary putting a company out of commission is probably the same power that the auditors have right now. If the auditor finds something very wrong with the last valuation of the company, or the last set of financial statements of the company, they put in a qualified opinion and that is going to affect the company. The actuaries are now put into the same position. Some of the discussions were around the issue that if the actuary doesn't say something, the public is going to infer that everything is fine and the company is satisfactory anyway. So, is the actuary safer in the longer term saying something about the company's financial state early on, rather than waiting until it's too late and you have a situation like Confederation Life happening and people losing money?

MR. PELLETIER: Let me deal with the general issue first before the Confederation Life corollary. First, I agree with what I think is your view that such a statement by the actuary is not going to help a company work out its problems. I am somewhat different from Helmut as well. Helmut stated during his presentation that he felt that the leadership of the profession would stick to its guns and continue with requiring the statement by the actuary. I hope that doesn't happen. There's a draft of a letter circulating right now among a number of concerned actuaries that will be going to the CIA council saying that this issue has not been well thought out, that it doesn't make sense that the appointed actuary take on the role of the regulator in that way. When regulators are working with companies, much of what happens is going on behind the scenes. They are able to help a company work its way out of its problems, where instead you are forcing this out into the open by an actuary having to perhaps not sign an opinion on a company, where every other actuary in Canada is signing on their companies. That makes that company stand out and as a matter of practicality that company is out of business. So forcing it into the open rather than leaving it where it should be, which is between the regulator and the company, appears to many actuaries in Canada to make no sense whatsoever. So I disagree with Helmut's conclusion of where this is going to take us.

As to whether it would have made a difference in the case of Confederation Life having had to sign that particular statement, it's hard to say what would have happened. It might have accelerated Confederation Life's demise, but I think its more important in the case of Confederation Life that it might have been different if maybe there had been a DST process a few years earlier. The first DST process was done during 1992. If DST had been around in earlier years, and had it been done rigorously, then perhaps some of the things that happened at Confederation Life could have been prevented. I think the DST process, rather than the signed opinion, is more important.

MR. JOHN HARDING: As we worked in the U.S. looking at the issues of surplus adequacy, one of the parts of the process that we believed to be very important was peer review. Does this exist in the Canadian scene, and if so, has it worked?

MR. PELLETIER: It's a good question. It's being discussed right now. It has not existed formally in Canada until lately, but the Superintendent of OSFI, in a speech at the CIA meeting in June of 1995, made it quite clear that we need more public disclosure in the way the actuarial work is carried out. This perhaps includes public disclosure of assumptions, or at least a process at getting at assumptions. Also, peer review is something that

he would like to see happen in the industry, but it hasn't happened as yet. The consultants are just waiting for it.

MS. HELEN GALT: Mr. Engels, could you comment on how you went about creating the models that you needed to model your company, especially given the diversity of your businesses?

MR. ENGELS: One thing we did early on was sign on with a consortium put together by a consulting company. They developed a DST model from scratch, based on Canadian reporting requirements. There was no commercial model in existence at that time that was based on Canadian reporting. In my company we operate in a very decentralized type of environment. We have operating divisions in Canada, the U.S., the U.K., two in Pacific Asia, a worldwide reinsurance operation, a bank in the U.K., and a couple of banks in Canada. What we did in the corporate office was come up with standards. We defined what scenarios we wanted and what type of base scenario everyone had to conform to. We worked with the investment division to define the future outlook of investments, defaults, interest rates, inflation, and so on. We made sure all the divisions were consistent. Then we defined the templates that we wanted the divisions to give us for the base scenario and for the other scenarios. Then each division was basically free to either use this corporate model that we had developed, and we'd help them with it, or they could develop their own models. In the end most people initially started with the corporate model. Corporate itself ran all of the asset segments centrally. A few divisions had their own models, and some were just in Lotus. In the end we had to put them all together and then again it was the role of corporate to make sure everything was consistent, and that everyone was giving commentary on the right things. You get stacks and stacks of output from this type of a process. Then we had to condense that into a 25-page report to the board, giving the essence of the projections. You don't need to give a large volume of data to the board, but you make sure that what they get is something that is actionable and that they can understand. I will say it again, it's a great deal of work.

MR. COLM FAGAN: I'm from Ireland, and I empathize completely with Mary's comment about zero tolerance for insolvency. Actually in Ireland zero is probably overstating it. There have been no insurance insolvencies in Ireland since, I think, the foundation of the state, definitely since the 1936 Insurance Act. I want to address another question that was raised about equity exposure. On the eastern side of the Atlantic we have covered this risk by what I would call the life insurance version of the neutron bomb. Basically everything will be destroyed but the insurance policy remains intact. They have put more and more into terminal bonuses which were completely at risk. So in theory, if equities did collapse, you're fine. We would just pay you out the basic sum insured. It doesn't matter that it was about 50% of what you expected. It is the same with modern flexible whole-life policies, where they can vary everything at will. I think what is putting that attitude at risk now is the whole move towards a more consumerist approach within the European Union. We've had, for instance, the recent implementation of the unfair contracts directive and we also have policyholders' reasonable expectations. We will have this in Ireland as well and I do think that these approaches are moving us away from what I call the neutron bomb approach. We do have to consider that if we are giving implicit guarantees or expectations to our consumers that we'd better meet them. I think that it is making many of these conditions very much more realistic now.