1993 VALUATION ACTUARY
SYMPOSIUM PROCEEDINGS

SESSION 8

Disability Income

David E. Scarlett

Stephen J. Rulis

Thomas S. Bell

Robert W. Beal

DISABILITY INCOME

MR. DAVID E. SCARLETT: We are fortunate to have three very knowledgeable and experienced actuaries on our panel; please let me introduce them to you.

Our first speaker is Steve Rulis who is associate actuary at the Hartford Life Insurance Company. Steve is responsible for group disability pricing and reserving at the Hartford. His responsibility is to discuss the draft of the group LTD practice notes as well as other group LTD valuation issues.

Next is Tom Bell, vice president and chief actuary at Massachusetts Casualty Insurance Company. Tom is responsible for all the actuarial functions at Mass. Casualty, including pricing and reserving. Tom will discuss the testing that his company performed at year-end 1992 to determine reserve adequacy.

Our third speaker is Bob Beal, vice president of finance, individual disability division at UNUM. Bob is responsible for all financial aspects of individual disability income (IDI), including pricing and reserving. Bob will discuss the draft of the individual disability practice notes, which he helped to write.

DISABILITY INCOME

MR. STEPHEN J. RULIS: I'm responsible for group disability pricing and reserving at The Hartford. As such, I'll be the token speaker from the group side of the house at this particular session.

There's a revolution going on out there in the world of group disability valuation.

No, it's not the kind of revolution The Beatles sang about in the 1960s. Rather, it's a revolution in the way group disability reserves are being calculated, monitored, and regulated. It used to be the case that group disability statutory reserves equaled GAAP reserves equaled tax reserves with few minimum standards applicable for any of the three bases, and relatively little guidance available to the actuary charged with valuing these reserves.

All that's changing now, with the advent of the Standard Valuation Law that defines minimum standards for accident and health statutory reserves. Many states have now adopted some version of the Standard Valuation Law. Further, the American Academy of Actuaries is taking steps to assist and guide actuaries who value group disability reserves and prepare statutory statements of opinion, by supplying examples of common approaches to these tasks. This guidance will be in the form of a group LTD Practice Note, a draft of which was distributed to all of you.

During the first part of my discussion, I'll be giving an overview and status update on the development of this Group LTD Practice Note. I'll then be moving on to discuss some other topics pertaining to group LTD valuation.

The initial draft of the Group LTD Practice Note has been developed by a group of five actuaries who practice in the group LTD field. The chairman of this group is Mike Cowell of UNUM, and the other members include Barry Allen of Provident Life & Accident, Art Baldwin of Paul Revere, Wayne Roberts of Standard of Oregon, and myself.

Since this draft is the work of a small subcommittee, I expect that the final version will be substantially different in some respects. I hope that you will review it carefully, and all of us developing the practice note look forward to receiving your comments. After the draft has been completely exposed for peer review, and all comments have been incorporated, we hope to finalize the practice note by the end of 1993.

As I mentioned earlier, the Group LTD Practice Note is being designed to address questions and issues regarding the valuation actuary's responsibilities for compliance with the Standard Valuation Law, and it attempts to do this by supplying examples of common valuation techniques. If you're looking for a cookbook recipe on how to value group LTD reserves, you're going to be disappointed, however. It's not our intent to hold the actuary's hand and walk him or her through the step-by-step reserving calculations; if that were our goal, it would be best accomplished by creating a PC program, not by developing a practice note. Rather, our intent is to outline the items that the valuation actuary should consider at a fairly high level, not unlike the type of outline a student would compose for a Society of Actuaries' exam.

With that said, I'd like to report that the Group LTD Practice Note looks quite similar to the practice notes for other health products in some aspects. For example, we start off by defining the product that is covered by the note, and move on to a statement regarding which laws and regulations the valuation actuary should be cognizant of. As with the practice notes for other health products, the goal of this practice note is to identify all areas of the product in question where liabilities may exist, and where reserves should therefore be calculated. The note then identifies common methodologies used to quantify these liabilities. Only reserves are addressed in this practice note. Capital and surplus and the assets backing them are not addressed.

Group LTD liabilities can basically be divided into two components: (1) the liability for claims incurred but not yet reported, also known as IBNR, and (2) the disabled lives reserve for known open claims, also known as DLR.

Any methodology for establishing the liability for IBNR consists of finding the best proxy to predict the claims that will develop from a given block of LTD premium.

One common methodology for setting IBNRs is the use of triangle development tables that examine claim reporting patterns from date disabled. This leads to a series of factors to be applied to past monthly premiums and quantifies the proportion of premiums that may still be unexposed.

The sum of the factors times past monthly premiums is then multiplied by an appropriate expected loss ratio to arrive at the amount of claims that may still be unreported.

Aggregate methods of calculating IBNRs are also commonly used. For example, the IBNR may be calculated as the sum of premiums received for the elimination period (EP) plus an additional 1.5 or 2 months of premiums to account for average reporting lag, times an expected loss ratio.

In either of these two methodologies, the expected loss ratio should represent the actuary's most current information. This may involve the application of an actual versus expected factor (A/E) times the pricing permissible loss ratio. The actuary may also choose to segment the block of business when using aggregate IBNR methodologies, if there is reason to believe that certain subsections of the business follow different reporting lags. For example, claims paid via a paperless "phone-in" claim system, or claims where the company is also paying the short-term disability benefits, may exhibit shorter than average reporting lags.

The IBNR may be designed to cover only unreported claims or may also be designed to account for liabilities on claims that have been reported but have not completed the EP. In the former case, the DLR must account for all reported claims, even those that have not completed the EP. In the latter, the DLR should account for only claims that are known and have completed the EP.

The DLR is generally designed to account for the present value of future claim payments plus claim settlement expenses, and should contain adequate margin for reasonable contingencies. The two most critical assumptions when calculating DLRs are the valuation termination rates and valuation interest rate. Termination rates generally vary by age at disability, sex, duration, and EP, and may also vary by cause of disability, social security status, and other parameters. Valuation interest rates are commonly a function of the claim's incurral date. The draft LTD practice note discusses items to be considered when choosing these valuation assumptions.

The liability for claims that are currently in the course of settlement (ICOS) must also be accounted for. One way of accounting for this liability is to hold a probability of approval times the DLR that would be held for an approved claim. For claims ICOS that have completed the EP, the actuary should also calculate the retrospective liability for amounts past due that will be paid if the claim is approved.

The draft LTD practice note also addresses asset and reserve adequacy analysis. The actuary should be able to demonstrate asset adequacy. In other words, he or she should be able to opine that the assets being held are adequate to meet the obligations of the LTD contracts under reasonably anticipated scenarios of claim termination rates, incidence rates, interest rates, and so on. Cash-flow testing is one tool that can be utilized in this adequacy demonstration.

If cash-flow testing is performed, then the analysis should be completed under a variety of plausible scenarios for deteriorating claims termination experience. This is, in essence, a sensitivity test of the valuation termination rates -- a piece of information that Frank Dino from the Colorado Insurance Department expressed great interest in seeing. If formal cash-flow testing is not performed for LTD, then at a minimum, the assets backing the LTD reserves should be reviewed for duration matching, quality, and yield.

Now that I've given you a high-level overview of the Group LTD Practice Note, I'd like to dig a little bit deeper into a few LTD valuation topics that I find particularly interesting, and also share with you some of the items we've been working on lately at Hartford Life.

I'll be using the rest of my allotted time then to discuss a couple of the more subtle points about IBNR calculations, DLR calculations, and some other topics.

We at Hartford Life commonly examine our LTD IBNR liability using a couple of different methodologies. One methodology we use is the aggregate method I just discussed, whereby the IBNR for a given case is the sum of (premiums received for the EP plus number of months in our average reporting lag), times an expected loss ratio. We've recently refined this methodology to account for the fact that both new cases and canceled cases have fewer past undeveloped months, and therefore will have a smaller average lag factor than ongoing cases.

Table 1 presents an example of how our average lag factor varies between new cases and ongoing cases. The sample IBNR calculation I've illustrated here assumes that our average reporting lag is 1.5 months after the end of the EP. This magnitude was arrived at by studying claim reporting patterns for cases that had been with us for an extended period of time. We've identified that approximately 35% of our claims are posted on the reserving system with no lag (i.e., before the end of the EP), another 20% are posted with one-month lag, 15% are posted with a two-month lag, etc., and the final 1% of our claims are posted with a lag of thirteen or more months. This averages out to 1.5 months.

Therefore, for a three-month EP case that has been on our books for an extended period of time, we'll hold an IBNR of 4.5 months of premium times an expected loss ratio. However, my illustration shows that our IBNR would be only 3.8 months of premium times the expected loss ratio if this case had only been on our books for five months. This 3.8 months of unexposed premium shows up on your handouts as 0.8 to account for reporting lag + 1 + 1 + 1 to account for the EP. This 3.8 is used instead of 4.5 because we don't need to account for any unreported claims that were incurred more than five months ago. Analogously, for a three-month EP case that has been canceled for five months, we don't need to account for any claims in the EP or with a one- or two-month lag. Therefore, we'd hold an IBNR reserve of an expected loss ratio times 0.7 months of premium, where 0.7 is the difference between the ultimate lag of 1.5 and the lag of 0.8 I just referred to.

TABLE 1

SAMPLE IBNR CALCULATION (3 MONTH EP)

# of Months Since Sale	Amount of Unexposed Premium (In Months)
1	1
2	1+1
3	1+1+1
4	0.50+1+1+1
5	0.80+1+1+1
6	1.0+1+1+1
-	-
-	-
-	-
14	1.45+1+1+1
15	1.48+1+1+1
16	1.50+1+1+1
17	1.50+1+1+1
-	-
-	-
-	-

Moving on to DLR calculations, I'd like to talk a little bit about factors we at Hartford Life have been considering when choosing our DLR assumptions.

I spoke at the 1992 Valuation Actuary Symposium in New York about the diagnosis-distinct termination rates we're utilizing to calculate our DLR. We've developed a set of termination rates that has been used for both GAAP and statutory reserving and accounts for all of the variables standardly considered when setting reserves, such as age, sex, duration and EP, as well as accounting for cause of disability. These termination rates contain a 10% margin to provide for adverse deviations, and they are based almost exclusively upon our own experience during the first two years of disability, and based on a blending of our own experience and the GLTD Table in years three through five. For years six and beyond we're using the GLTD table.

As one might expect, the DLR for our entire block of business did not change appreciably when we implemented these diagnosis-distinct termination rates. However, the reserves for individual

claims and some specific cases increased or decreased quite dramatically. With many states now adopting a version of the Standard Valuation Law that allows use of a company's own termination experience during only the first two years of a claim, it looks as if we'll be revising these termination rates accordingly for statutory reserving. However, we do plan to continue recognizing cause of disability in our statutory reserving termination rates.

One interesting aspect we encountered when studying our own experience to develop these diagnosis-distinct termination rates was a very large increase in terminations during the months surrounding "test-change." Approximately 90% of our claims have disability defined as the "inability to perform your own occupation" during the first two years of benefit payment, and the inability to perform any occupation you are reasonably suited for thereafter. We had long suspected that this change in definition was leading to a substantial increase in termination activity, but we were surprised at how clear the pattern was. For all causes of disability except AIDS and Complications of Maternity, our actual termination rates increase by 50% or more during the three- to four-month period surrounding "test-change," with the largest termination rate occurring during the first month of the "any occupation" period.

With this information in hand, we debated over whether to include this "test-change blip" in our reserving termination rates, and if so, should it be included when calculating reserves for all claims, or just those with our standard definition of disability. We decided to include the "test-change blip" for claims that do contain the two-year "own-occupation" clause, and to exclude it for claims with an "own-occupation to age 65" definition. This has resulted in a set a termination rate curves that are basically monotonically decreasing from the date of disability on, with the exception of removable three- to four-month blips in the shape of upside-down cones during months 23 to 26 since benefit begin date.

An interesting note here is that, from a line of business perspective, I would not have been uncomfortable using the termination rates including these "test-change blips" to value all of our claims, since the termination rates would have been based on raw data from claims with varying definitions of disability. In that case, it would have been necessary to monitor our mix of

business to verify that the distribution of claims by disability definition was not changing materially. However, from the individual case valuation perspective, we have found it advantageous to be able to include or exclude the "test-change blips" as appropriate.

On top of the periodic Schedule O reserve adequacy tests that many companies perform to monitor reserve adequacy, we've recently developed an algorithm and mainframe computer program to monitor our A/E terminations by business segment or for our block as a whole. For example, we've been studying A/E terminations by industry, EP, and case size, as well as A/E terminations for each of our claim offices. This A/E program has allowed us to validate our termination assumptions by diagnosis category and for our entire block of claims. Some other by-products of this program are that we now have the ability to analyze case-specific claim runout patterns when renewing large cases, and we now have an objective way of measuring the performance of our various claim offices.

Moving on to interest rates, our reserving interest rates are based on a claim's year of incurral. We set our GAAP interest rates equal to the LTD portfolio's new money rate for a given calendar year, less the liftoff that is needed to attain our desired ROE on surplus associated with the DLR. We like this approach because it lends to a certain amount of profit being released in proportion to the risks associated with reserves. Alternately, some companies may choose to calculate GAAP reserves using actual earned rates. Statutory reserves are, of course, subject to the interest rates prescribed in the Standard Valuation Laws minimum reserve standards.

I alluded earlier to the relationship that exists between LTD valuation from a line-of-business perspective and case-specific LTD valuation. I would define financial reserves as those used for line-of-business financial reporting, and underwriting reserves as those used for specific case pricing. When valuing reserves for specific cases at renewal time, it may be appropriate to choose different assumptions from those used for financial reporting. Also, the actuary may decide to account for case-specific trends. For example, underwriting reserves may be based somewhat on a case's own termination rate patterns, or they may reflect the likelihood of unknown offsets that are unique to that case. Similarly, when performing renewal underwriting

on a case, it may be appropriate to account for information on specific claims that the company's financial reserves do not account for, such as input from the claim examiner on possible return to work dates.

Since the company's financial reserve assumptions are designed to be appropriate for it's block of claims as a whole, the financial reserves will always be larger than necessary for some claims and smaller than necessary for others. Case-specific underwriting reserves may be adjusted accordingly to account for a disproportionate amount of short-term or long-term claims on a given case. Underwriting reserves may also be designed to have additional margins, that may or may not be mitigated in competitive pricing situations.

Interest rates are a factor that clearly play a role in both LTD reserving and LTD pricing. A drop of 100 basis points in valuation interest rates leads to an increase of approximately 5% in reserve magnitude. Interest rates have dropped more than 300 basis points in the past few years. With this in mind, LTD premium rates should have increased by 10 - 15% over this same period of time. As we all know, this has not been the case, but premium rates will certainly have to increase at some point if interest rates do not rebound.

LTD claim reserve buyouts are another area where the relationship between reserving and pricing is especially clear. Financial Accounting Standard (FAS) 112, which goes into effect later this year, requires employers to account for liabilities associated with postemployment benefits on their GAAP balance sheets. Self-funded LTD plans are one example of this type of liability.

We've seen an increased number of requests lately from employers looking to buy coverage for their self-funded open claims in order to avoid the need for setting up this GAAP liability. When pricing these requests, we simply value the reserves in question, then load for expenses, taxes, and profit. However, all of our termination studies and A/E termination reports have excluded both terminations and exposures from claims acquired via reserve buyouts. This is

because we are picking these claims up in midstream, and they may have artificially high or low termination rates during their first few months of exposure with us.

Lump-sum claim settlements have existed in the workers' compensation arena for a number of years, and they are now becoming more prevalent with LTD claims. We at Hartford Life have used lump-sum settlements in the past to close a few longer-term claims for dollar amounts we believe to be fair to both the claimants and the company. We plan to continue exploring this opportunity in the future. Claim settlements can present a real win-win situation, because claimants are presented with dollar amounts that are large enough to pursue other interests, such as starting businesses or purchasing investment vehicles, while the company can close claims for amounts less than or equal to the reserve it is holding.

When determining settlement amounts, we consider the reserve amounts using a current interest rate, as well as "best-guess" liabilities for the claims, using our claim examiners' input. We have also set some objective guidelines that must be met in order for us to settle a claim, including a requirement that the claimant be properly represented by an attorney or financial advisor.

Since our frequency of claim settlements has been relatively insignificant in the past, we decided to exclude all terminations and exposures of these claims from our termination studies. Alternatively, these claims could be included by using a termination date that is implied by the settlement amount. The actuary should certainly consider the impact of claim settlements when monitoring reserve assumptions for appropriateness. For example, if the claims being settled are those that would have terminated quickly anyway, then the termination rates used to reserve for the block of remaining claims will need to be decreased accordingly.

As I mentioned earlier, cash-flow testing is one way of demonstrating the adequacy of assets relative to the company's group LTD liabilities. LTD has no significant exposure to the interest rate or C-3 risk. Rather, the most significant risk for LTD is the C-2 insurance risk arising from claim termination experience deviating from that assumed in valuation and pricing. With

this in mind, I believe that LTD asset adequacy could be demonstrated without completing formal cash-flow testing, using a combination of asset/liability duration matching testing and sensitivity testing of reserve assumptions. However, with cash-flow testing required for so many of our other lines of business, we have been able to perform cash-flow testing in conjunction with sensitivity testing for our LTD block without a great deal of additional work.

We at Hartford Life have utilized deterministic interest rate scenarios when performing cash-flow testing for LTD and our other product lines, since these scenarios seem to be most efficient at measuring the extremes of plausible interest scenarios. The use of stochastic scenarios for LTD cash-flow testing can also prove valuable, as long as the stochastic scenarios generated sufficiently cover the spectrum of reasonable interest rate scenarios. We have chosen to perform closed-block testing for our LTD line of business, since the appointed actuary is offering an opinion on in-force business as of the valuation date. However, it is not uncommon to rely on future new business when setting expense and other assumptions.

—

Back in the 1960s, Bob Dylan wrote that "the times, they are a changin'." Well, the times are changing here and now in the world of group disability valuation. It's certainly an exciting time to be a health valuation actuary, but with this changing environment comes a responsibility to our companies to stay up-to-date with current requirements and practices, as well as a responsibility to our profession to consider and identify innovative and more appropriate ways of addressing valuation issues.

With this in mind, I'd like to once again encourage all of you to carefully review the draft LTD practice note you received, and please forward your comments on to Mike Cowell or one of the other committee members at our respective *Yearbook* addresses.

MR. THOMAS S. BELL: What I am going to talk to you about might be characterized as a case study of what our company did with respect to gross premium valuation for the year-end, December 1992. A gross premium valuation is basically taking into account the future flow of gross premiums that you are going to receive, and the payments you are going to pay out, and the expenses, and so on and see how all that compares to the reserves that you are holding. To some extent what I am going to be saying is an update of what my colleague Bob Shlifer talked about a year ago. Some of you probably were here at the valuation symposium at that time.

The big thing that has changed from a year ago when Bob talked was that December 31 came along and we had to actually make some decisions. At the time Bob spoke, we were doing lots of testing, and "What if this happens? And what if that happens?" But there is nothing like having an external deadline imposed on you, and you have to do something. So I am going to talk about that.

In fact, I am going to talk to you under six headings. Number one is the development of the model. Number two is setting the best estimate assumptions. Three is sensitivity testing. Four is margins. Five is the decisions we made on December 31, 1992. And finally, six is enhancements and updates to the model.

Before getting into the first point, though, let me just give you very briefly an outline of Mass. Casualty and who we are, and where we fit in. As some of you perhaps know, we are a wholly owned subsidiary of Sun Life of Canada. Sun Life acquired Mass. Casualty in early 1987. The corporate structure leads to some interesting consensus making when it comes to setting reserves. I have to sign off on the Mass. Casualty statement, but we also talked to our colleagues in the U.S. office in Wellesley, Massachusetts, and our corporate colleagues in Toronto. The corporate actuary has to, of course, sign off on the consolidated statement. The downside of having a structure like that is that it takes a long time to get consensus on things. The plus side is that there is nothing like peer review to let you know that you are on the right track.

Here are some of the parameters of our company, just so you can perhaps relate it to the size of your operation. We are 100% in the IDI business. We are the only company in the U.S. that is 100% in that line of business. We have around 80,000 policies in force. We sell about $10 million of new premium per year. We have about $50 million of premium in force. There are around 130 employees, and our net reserves are in the order of $100 million. I mention those only because, when you are building a model, you really have to tailor it to the size of the block of business that you are looking at. I am going to be talking mostly in terms of the thought process. I do not mind sharing some of the specifics with you. But, frankly, they will not apply to your company anyway.

The first item is developing the model. I am going to be talking almost entirely about the liability side of the model, although I will be talking about the asset side somewhat. We had two main reasons for developing a gross premium valuation model. The specific one being, of course, that we had to do something by the end of 1992. But we also had this on our list of things that would be a really good idea to do anyway. So the external requirement elevated the priority. The model was a joint effort with our colleagues at Sun Life, and in fact, they did a lot of the programming work. Our model is written in APL. The results are summarized in Lotus. After we had developed the insurance cash flows, we fed them into our investment model to have it tell us what the after-tax earning rates were. I am going to talk about the topics in a sequential order just for discussion purposes. But of course, you are really thinking about all of these items simultaneously, and it is an iterative process.

Do you create a sample in model office, or do you use the entire file of policies? There are pluses and minuses on each side of that one. It is a closed block, though. You are valuing the policies you actually have in force at a point in time. So it is very tempting to use the whole file. This is unlike the task of projecting future sales, where you have to make a whole bunch of assumptions about future sales. Here you do not. You know exactly what policies you have to deal with. I guess the major advantage of using the entire file is, it saves you a whole lot of time of convincing yourself that any other model is realistic. You tend to have more confidence

in the model. Also, for a company our size it is feasible to do the entire file. That might not be so for some bigger company.

Another consideration is the deterministic versus the stochastic approach. It is simpler to do it under the deterministic basis. It requires fewer assumptions. You do not have to hypothesize or find out what the distribution is. But on the other hand, you learn less. So there are again trade-offs.

The next item is what I call "the structure of the variables." What I was thinking of here was that, once you build a model, you are going to have to feed to the computer values for all the different variables you have defined. If you know you are not going to be able to get a value for a certain variable, then you are wasting time building it into the model. Don't build in a level of sophistication that you cannot test. Let's look at an example. For lapses, ultimately we ended up using one vector of lapse rates for the whole portfolio. But you could certainly argue for different lapse rates by class, by age, and so on. One advantage of having a more extensive set of variables is that you then can do more "what if" testing. It may point you in the direction of where you need some more work.

At the session on modeling, there was a discussion of computer run time. I think it was the first of the speakers who mentioned that, as computers get faster, actuaries seem to have a way of building more sophisticated models. So you never quite catch up. Our model is very sophisticated. We project the runout of claims for the claims that are there at the start of the valuation and also hypothesize the incidence and termination rates of future claims. So we are projecting in two dimensions. We split termination assumptions between short-term and long-term benefit periods. It is a lot of number-crunching to do. The current model is such that we can only do one run per day. This is a limitation. Our conclusion was to use the entire file. It is a deterministic model.

The next topic I want to talk about was best-estimate assumptions. We had to update all our prior experience studies, of course. For morbidity there are the incidence and termination rates,

both of which are crucial. You have to figure out how many years of experience you are going to use. What is the trend? Then you have to deal with confidence intervals. How much do you want the incidence to vary by plan, by class? How credible is your business? Should you be using industry experience? How many years are you going to project for it? Do you want to project trends? What about conservatism? There are a whole bunch of issues like that.

Much of the same considerations apply to termination rates with the added problem that for termination rates, even the very large companies have a sparsity of data after a couple of years of claim being in force. Companies are almost forced to rely on industry experience.

On lapses there are a couple of other considerations you have to think your way through. One is, can lapse rates be managed? Can you do anything about them other than just observe and measure them? Probably the important question is, are lapses independent of morbidity? If for IDI, you assume they are independent, you get the strange result that in later durations high lapse rates are to the advantage of the company because that is where the morbidity is. But this leads to a conclusion that does not seem to make sense. I think the reality is that lapses are not independent of morbidity. If you assume they are independent, you are implicitly assuming that those who lapse take with them average morbidity, which probably is not the case.

We had to do an up-to-date expense analysis. We had to make assumptions about inflation and all the other work that goes into an expense analysis. One concern that is special to a gross premium valuation is that, when you are allocating between first-year expenses and renewal expenses, you have to be careful. First-year expenses do not affect a gross premium valuation. So you can fool yourself if you put more than you should in the first-year expenses.

Regarding investment income, one thing that we achieved out of doing all this work was that we began much more aware of the matching issues. DI liabilities are very long.

We were doing most of the work in 1992. It is now 1993. So we can go back and look at what happened in 1992, and you start to be able to deal with questions of what degree of fit did your model have?

Next I would like to talk very briefly on the topics that I mentioned at the outset. I am going to talk about sensitivity testing, margins, decisions we made, and enhancements and updates.

Sensitivity testing was talked about at some length in the session on modeling. The first time you build and run a model you really do not have a feel for which variables are going to turn out to be the sensitive ones. Now that we have done it we know which variables are key. I have found it a really useful exercise to force yourself to write down what you think the answer is going to be. It is a hard thing to do. But if you do not force yourself to write down what you expect, then you never know if you are surprised at what comes out. So it is a good reality check. If something comes out that is really radically different from what you expected, then you want to go back and think about it.

Consider the independence of assumptions. I already mentioned the morbidity lapse one. Another one you have to think through is that incidence rates and termination rates are independent. You can make the case that, if you have a high number of new claims, maybe some of them are not going to last as long. Maybe they go in opposite directions.

Now I have some points pertaining to margins. Of course, this is to cover adverse outcomes. You will see wording that has been talked about at the meeting already. We will use terms like *moderately adverse*. There are a whole bunch of problems with words like that. The first one is that you could take any two people and discuss what you meant by *moderately adverse*, and I will guarantee you that you will get different interpretations. So one problem is the verbal part of what do those words mean? Even if you were to agree on what the words mean, then you have the task of converting words into numbers. And if you do not know the distribution of the reserves, it is a pretty hard thing to do. Also even if you knew the distribution, some people will say you need to be 75% confident of an outcome. Someone else might say, 80%. Someone

will say, 95%. Who knows? So there is a whole area that is partly quantitative and partly subjective. It is really tough to know exactly what the best solution is.

In our case, because we are a Canadian-based company we have to be aware of regulatory concerns in both Canada and the U.S. When that comes to reserving, it tends to mean you have to adhere to the most conservative reserving requirements of one or other of the countries. For Mass. Casualty, Canadian requirements are more conservative than U.S. requirements.

There is the question of the role of surplus versus reserves. I will not get into that. That has been widely talked about. Clearly if you have a bigger surplus, you would be less concerned about the adequacy of reserves than if the reverse were true.

The likelihood of adverse outcomes cannot be quantified with a deterministic model. You can try the worst cases, but it is really hard to get a feel for the distribution. So I would think over time companies will develop stochastic models.

The final issue that I wish to discuss is that there are short-term versus long-term implications. This is a delicate area. Many actuaries particularly perhaps ones in smaller companies are also part of the management team. Strengthening reserves has an adverse effect in the short term on your income statement. You have to remind yourself that ultimately the success of the company will not depend on the reserves. Reserves just affect the incidence of when the profits show up. So you might think you are doing yourself a favor to hold incredibly strong reserves, but if that shows you in a negative light in the short term, then you can run into rating agency problems, which can affect the company's ability to generate future sales. This can have severe long-term implications.

Let me turn to the decisions we made at the end of 1992. In our case, there were really two outcomes. One is we did strengthen the reserves. I should make it clear that our best estimate of the reserve required was well below what the statutory reserves were. But the question of margins and so on were such that we decided to add something.

The other point that was highlighted really was the question of matching the assets and the liabilities. And we have become much more aware of this issue as it relates to IDI. As a result we are reviewing our investment strategy.

Finally I would like to talk a little bit about enhancements and updates. This question of building models never ends. The reason is partly because events change and partly because actuaries like to build a better model. When time goes by, lets say a year has gone by, a couple of things happen. First of all, of course, you have new data. You can review experience for each variable. You have new estimators for the different variables. The other change is that you have another year's worth of new business. So you have a different file. You have a new starting point.

Another issue we are going to have to grapple with is that we built confidence intervals around some of the variables. Then you observe one more year of data. If it is within the confidence interval, does that mean you do not change your assumptions, or even if it is outside the interval, is that the one time in twenty it is outside? In enhancing the model, I know we will do some more work in the area of lapses. And there is always the question of, should you have a stochastic model?

Let me sum up by just telling you some of the conclusions that I have reached. There are many, and I have tried in a short period to boil down what was really countless hours of both mathematical work, and also discussion and interpretation of the outcomes. I have picked three or four points just to summarize. A gross premium valuation model is a very illuminating additional actuarial tool. We now run our gross premium valuation quarterly, and it is a tremendous comfort to be able to do that, and to know what is going on. It has highlighted for me that there is not a consensus, industrywide, on exactly how big the margin should be for reserves, and I did not even talk about surplus. Then there is the whole question of RBC and margins and things like that. We have built up our knowledge level, and our confidence significantly. And finally we have learned a lot not only about reserves, but also about how to build better models.

MR. ROBERT W. BEAL: The Individual Health Insurance Practice Notes are descriptions of current practices used by the health insurance valuation actuaries in the U.S. There are practice notes being developed on a variety of specific health insurance forms, including group LTD, small group medical, and individual disability, as well as one covering basic principles and units relevant to all forms of health insurance. Similar practice notes have been or are in the process of being developed on the life insurance side.

My purpose is to talk about the IDI Practice Note. It is presently in draft form -- the second draft to be precise -- which is being exposed right now for peer review and broader comment. I suspect there is a lot more work to be done on it, and probably the final version will not look much like the current draft.

Specifically, I want to spend a few minutes explaining the purpose and general comment of the IDI Practice Note: but spend the bulk of my time discussing some of the many specific issues and practices that the practice note is trying to address.

First, let me take a moment to illustrate where the IDI Practice Note falls in the larger actuarial organization. I'm always curious where and how some of these various reports or publications originate either in the Society or the Academy.

The Academy is at the top with the State Healthcare Issue Committee directly below it. This committee generally reviews the various health regulations and policies coming from the states, or more specifically, the NAIC, and provides actuarial comment representing the Academy. It was this committee that organized and charged the Health Valuation Practice Note Committee with developing descriptions of current health valuation practices in the U.S. In that capacity it created the IDI Insurance Subcommittee chaired by Dave Scarlett. On this subcommittee, in addition to Dave and myself, are Bob Shlifer from Sun Life and Al Riggeri from Paul Revere. The four of us have brought the discussion quite a few years of experience concentrated in IDI.

However, in no way do we represent ourselves as "The Experts" on the subject of IDI valuations.

Before getting into specific issues and practices, allow me to clarify even more the purpose of the Health Insurance Practice Note. It's a description of common valuation practices and issues to give the valuation actuary a helpful reference to a variety of industry practices. We view the practice notes as assistance to actuaries preparing the Statement of Opinion.

It may be more helpful to explain what the practices notes are not. They are not promulgated by the ASB or any authoritative body of the Academy. Therefore, they are not binding on the valuation actuary and do not require the valuation actuary to follow any of the practices described in the note. They are certainly not complete in either covering the various practices around any one valuation issue, let alone complete in covering all the relevant issues that the valuation actuary may come upon. Finally, the practice notes do not represent a definitive statement on GAAP.

Now with that giant disclaimer over with, let's talk specifically about the IDI Practice Note. Its content consists of a series of questions and answers that can be roughly broken down into first, those covering issues and practices regarding appropriate IDI reserves, and second, those covering issues and practices around cash-flow testing for IDI reserves. Presently, our draft spends a disproportionate amount of space on the first type of issues and practices -- probably because we know a whole lot more about them than about cash-flow testing. But in all honesty, because of the many types of coverage, the variety of IDI experience among companies and actuaries, and the incompleteness of laws and regulations related to IDI, valuing IDI reserves is not as cut and dry as you might find on the individual life side of the house. It's very easy to miss valuing significant portions of the IDI liability, unless you either have a lot of experience in this area or have access to how other actuaries approach IDI reserving. I hope the IDI Practice Note will reduce the chance of ignoring or substantially undervaluing a significant part of the IDI risk.

Now it's time to get to some specific issues. I've chosen ten questions for our discussion, but the practice note gets into a lot more. My answers are generally consistent with the practice note, but I may on occasion include additional observations. My purpose is to give you a sense of the practice notes content, as well as elicit some reactions from you.

Which Laws and Regulations Apply?

Most IDI actuaries will quickly mention the Standard Valuation Law, which specifically refers to the Model Regulation on Minimum Reserve Standard for Individual and Group Health Insurance Contracts. Two problems arise. First, the Standard Valuation Law and Model Regulation do not address all the various forms of coverage that have emerged since the late 1970s. Some of my later questions address a few of these situations. Second and maybe more frustrating for the valuation IDI actuary is that not all states have adopted uniformly the minimum reserve standards. Many states have no standards at all. Where there are standards, they may not be updated to recognize more modern tables. Even New York does not recognize the 1985 Commissioners Individual Disability Table A (CIDA) tables yet.

Technically, we actuaries probably should be reserving each policy or claim to recognize the minimum standards of the state where the policy was issued. However, I suspect few companies follow this rule to the extreme and rather employ one basis for all states.

Which Actuarial Standards of Practice Apply to the IDI Valuation Actuary?

Although there are a number of actuarial standards of practice that apply to some degree, I will mention what we view as the three most relevant:

- No. 5 -- Incurred Health Claim Liabilities
- No. 14 -- When to Do Cash-Flow Testing for Life and Health Insurance Companies
- No. 22 -- Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers.

Do IDI Valuation Actuaries Add Margins for Conservatism?

Actuarial Standard of Practice No. 5, Section 5.1, states "varying degrees of conservatism or margin will be appropriate, depending on the purpose of the estimate." The level of conservatism depends on the assumptions. For contract reserves, the 1964 CDT basis is generally viewed as quite conservative without an additional load.

On the other hand, there is some concern that contract reserves based on the 1985 CIDA tables may inadequately represent annual claim costs for many companies and that explicit loadings may be necessary just to make them adequate, let alone to add a margin for conservatism. Appropriate adequacy testing such as a gross premium valuation, should determine whether such margins and loadings are necessary.

For claim reserves, the unadjusted 1964 Commissioners Disability Table (CDT) has been largely dismissed as inadequate. The 1985 CIDA table has also been considered light for many companies. In any case, companies should be reviewing their actual claim runout experience at least annually and appropriately adjusting claim reserve factors or the underlying continuance tables. Many companies have been working to just maintain adequate claim reserves in recent years, making the question of conservative margins seem almost academic. Some companies may also point to the spread between the discount rate and their portfolio rates as their margin of conservatism.

What Inflation Assumptions Are Appropriate for Cost-of-Living Riders?

This is an excellent example of where there is no minimum reserve standard for either contract reserves or claim reserves. Some actuaries choose to subtract a representative "real" interest rate from the discount rate and let the difference be the inflation assumption. If discount rates are low, the result may be an inadequate inflation assumption. I prefer to rely on a best estimate of future inflation assumptions.

How Should We Reserve Residual Benefits?

This is another example of no minimum reserve standards. Complicating the situation is the lack of industry data on residual benefits. As for specific company data, companies at best can probably say whether their premiums charged for the residual benefit have been roughly adequate or not. Given the variety of residual features, I can say that my own company experience dismisses the argument that the real residual premium should be negative because it encourages claimants to return to work. Many IDI actuaries develop contract reserves for residual benefits using the ratio of the residual premium to the total only premium, possibly adjusted for fixed expenses. For claim reserves, a typical approach for claims receiving residual benefits is to adjust the base claim reserve in proportion to the current residual benefit. This causes some theoretical problems such as, Does the base continuance table anticipate the claimant receiving residual benefits, or does the residual reserve anticipate the claimant going back to total? Probably not, at least directly. However, overall adequacy testing of reserves should demonstrate whether the aggregate reserve with all the policy and rider features are generally adequate.

Should We Hold Active Life Reserves When the Policy Is on Claim?

This is one of my favorite questions. A lot of people, particularly nonactuaries, are surprised when I tell them that active life reserves should be held on claimants. Even actuaries sometimes think the active life reserve should be released to fund the claim reserve, much in the same way as life insurance works. The term *active life* refers to all policies in force, whether on claim or not. In the development of claim costs for the active life reserves, the exposure includes all policies in force. If the exposure were reduced for policies on claim, then you could rightfully argue that active life reserves do not belong on disabled policies. But I do not believe exposures are calculated this way.

What Discount Rates Are Being Used for Claim Reserves?

Some companies simply use the discount rates in the statutory minimum reserve bases. Some other companies may choose a lower interest rate in order to compensate for possible inadequacies in the underlying continuance table. Another approach is to adjust tabular reserve

factors that are based on statutory minimum morbidity and interest bases. The adjustments reflect the company's own experience with respect to both interest and claim runout. My own company develops continuance tables based upon our own experience and discounts at a rate close to our portfolio rate adjusted for the default and call risk. We then demonstrate that claim reserves satisfy statutory minimum requirements in the aggregate.

There was an interesting interpretation of the Model Regulation that was brought up during our practice note subcommittee discussions. It says that the continuance table must be adequate independent of the interest rate assumption, and the interest rates could not exceed the statutory minimum bases. I don't agree with this interpretation, but thought by mentioning it, it might invite some discussion later.

How Should We Recognize the Reopened Claim Liability?

As a little background on the subject, let me state that the claim reserve or the valuation date should adequately cover the present value of future benefits of all claims disabled on or before the valuation date. This present value includes claims closed as of the valuation date that subsequently become reopened. In testing reserve adequacy, the reopened claim liability could be easily overlooked. Companies that do take it into account may simply cover the risk through implicit margins in the reserve bases, or companies may choose to add an explicit margin, either to the table or to the overall reserves. Reopens have become more significant the last few years as it has become more difficult to close claims. I'm certain that margins that were once available to cover this risk are being squeezed dearly.

Is Cash-Flow Testing Necessary for IDI?

In preparing a Section 8 opinion, versus Section 7, the subcommittee concluded that cash-flow testing is necessary. IDI usually develops substantial active life and claim reserves compared to some other forms of health insurance. Although there is no disintermediation risk to speak of, there are still the default and reinvestment risks.

What Is an Appropriate Confidence Level?

Under Actuarial Standard of Practice No. 22, reserves are expected to withstand at least moderately adverse deviations in future experience. Some actuaries interpret this as at least a 70% confidence interval, but there is no rule specifying a desirable confidence level that I know of. Of course, once you have a specific confidence level in mind, how do you use it? If you are using some predefined scenarios, you have to know which ones fall within your confidence level. If your cash-flow testing involves Monte Carlo techniques, then you can statistically determine whether your reserves were adequate the desired number of times. However, the results are not necessarily so objective if you must enter how you anticipate the expected assumptions might trend over time. A Life Practice Note that we've heard about may shine some light on a lot of the cash-flow-testing questions that surface for individual disability.

This pretty much wraps up my comments. There are a lot more issues being addressed or should be addressed in our current draft of the practice note. We would really appreciate hearing your comments and issues. Please don't be afraid of disagreeing with any of my comments or giving us your critique. The only risk is that your comments may wind up in our next draft.

MR. ARMAND M. DE PALO: I'd like to have some input from anyone on the panel as to exactly how the committee is handling the expense for claim settlement? Where in the statement have the committee members chosen to put it? Or are they relying on the adequacy of the claim reserve itself to cover that component?

MR. SCARLETT: I think it's clear now to everyone that claim expense reserves have to be set up. As I work with various clients, I have discovered that some companies aren't convinced of that yet. However, it seems absolutely clear that companies must establish some sort of reasonable claim settlement expense reserve.

MR. WILLIAM K. ROBINSON: In the *Examiners Handbook* of the NAIC, there is a clear statement that claim settlement expense reserves are to be set up as expense liabilities in Exhibit

5. And anyone who goes to that handbook can find it there, in the liability sections. It's been in there for a long time.

MR. SCARLETT: Thanks for that answer. I appreciate that.

MR. BILL ZANNER: I have a question for you in particular, Bob, on reopened claims: What do you use as the date of disability? Do you use the original date of disability, the date of the new disability, or something in between?

MR. BEAL: We use the original date. For it to be a reopened claim, it has to fall within the contractual definition. It's not a new claim. If you have a six-month provision in your contract, and the claim reopens within six months, the original disability date should be used for reserving purposes.

GAYLE E. EMMERT: Tom Bell, you mentioned you did a gross premium valuation rather than cash-flow testing. I don't recall whether you said anything about how you decided to go the gross premium valuation route instead of cash-flow testing. When you did the gross premium valuation, did you feel that it was necessary to do sensitivity testing, and use various assumptions?

MR. BELL: I have a lot of trouble frankly with the terminology. I think we did both cash-flow testing and a gross premium valuation at the same time. We did a gross premium valuation, but we also were looking at the cash flows year by year. We tested different interest rate scenarios.

MR. SCARLETT: I don't think that cash-flow testing and a gross premium valuation are mutually exclusive. Some companies are doing cash-flow testing, predicting what the liability cash flows are, predicting what asset cash flows are, perhaps under various interest rate scenarios. This cash-flow analysis allows the companies to project vectors of portfolio interest rates. Then the interest rate vectors from that analysis are used in a gross premium valuation.

The results of the gross premium valuation are then compared to the reserves actually being held. The process is really a combination of cash-flow testing and a gross premium valuation.

MR. TOM G. STRICKLAND: I have a question for Steven Rulis. Could you briefly describe your approach to experience studies of offset decrements, and how do you deal with them in the actual valuation?

MR. RULIS: We segregate our offsets into two types: social security offsets and other offsets. With respect to the social security offsets, we've developed a significant history that we're really comfortable studying. We can accurately predict how likely a claim, with unknown social security status at a given duration, is to eventually receive social security. We vary those unknown social security approval rates by duration, sex, and two diagnosis groupings. For all of the other offsets, we have an aggregate offset assumption, which varies by duration since date of disability.

HEALTH PRACTICE NOTE REQUEST FORM

The Health Practice Notes for the Appointed Actuary were sent to all members of the Life Financial Reporting Section in January 1994.

If you are not in the Life Financial Reporting Section but would like a copy of the Health Practice Notes, please send this form to: Christine Cassidy, American Academy of Actuaries, 1720 I Street, NW, 7th Floor, Washington, D.C. 20006

Name: _____

Company: _____

Address: _____

_____

Phone: _____