1997 VALUATION ACTUARY SYMPOSIUM PROCEEDINGS

SESSION 5

Health Cash-Flow Testing

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HEALTH CASH-FLOW TESTING

MR. KEVIN J. BORCHERT: I work with Fortis Benefits insurance company in Kansas City, Missouri. Kenneth Hammond is from SunLife and Donna Novak is from Deloitte and Touche. I'll cover an overview of group products, Kenneth will focus primarily on long-term disability (LTD), and Donna will talk about some health care issues.

I want to talk a little about modeling in general. There are many different needs we have for modeling, and by the end of the session, I hope to convince you that you need one main engine versus having different models for different needs. It creates a lot of redundant work if you're creating a model to do the given task at hand.

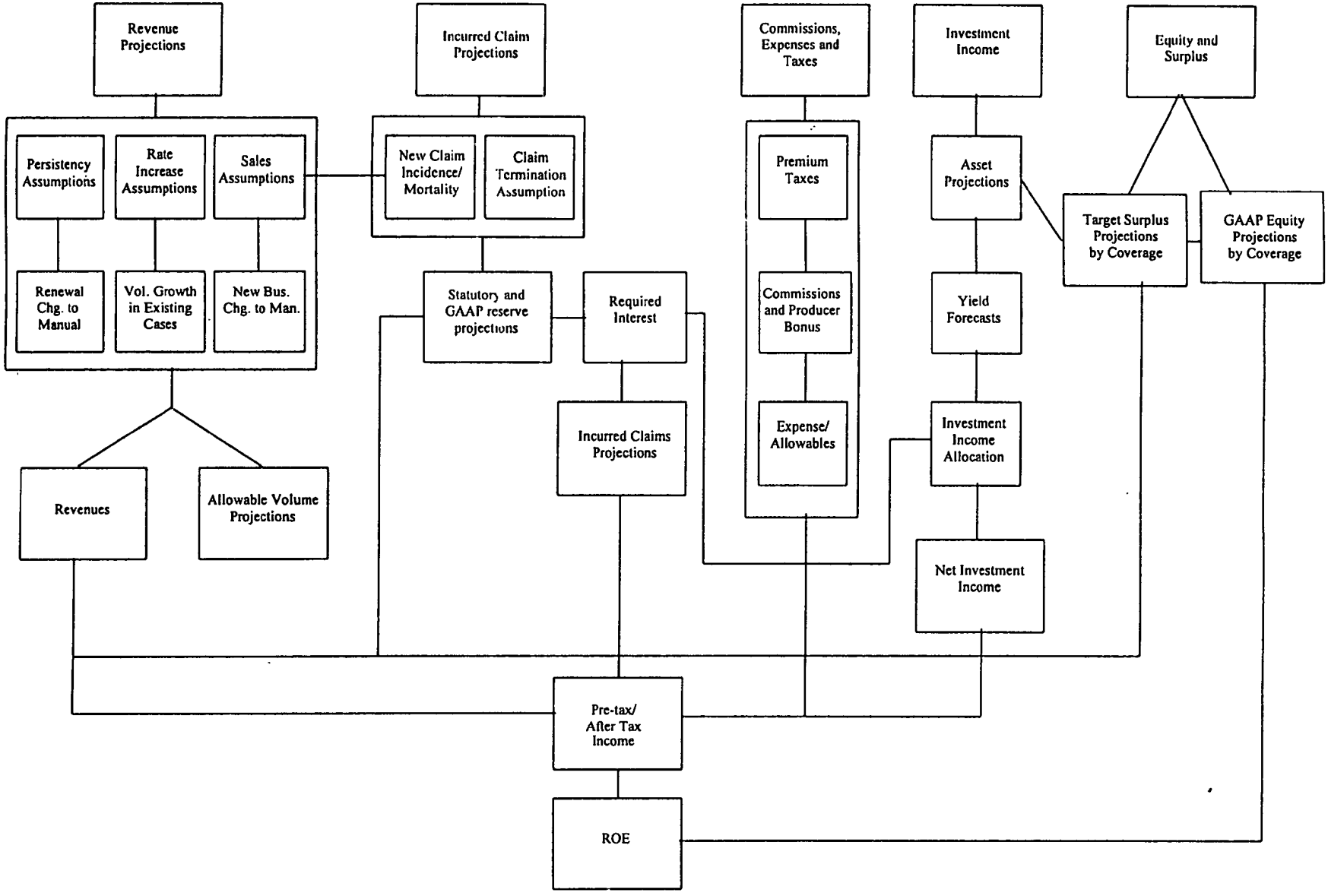
At the top of Chart 1 are five main modules: (1) revenue; (2) incurred claims; (3) expenses, which includes commissions; premium and income taxes; (4) investment income; and (5) equity and surplus, a balance sheet component in which you're either allocating surplus or equity to a line. We'll talk about each of the components as we go along. But this flow chart will show how they interrelate. New sales will impact new claim levels. The models can be built separately, but they have to interrelate to each other. So more than anything, Chart 1 represents how the dynamics of the modules will feed each other. I may reference this as we proceed.

As far as modeling goes, one needs a model for cash-flow testing, operating, planning (which primarily may have a GAAP or embedded value focus), and capital projections, etc. Regarding any forecasting, I'll focus on big-picture ideas. Kenneth may get into some specifics as he gets into his LTD discussion.

For cash-flow testing you really have to have a liability model that will kick out your underwriting cash flows. There is kind of a 20-year focus here. Some companies actually do a quarterly

CHART 1

Forecasting Model Components



projection for 20 years. So that's quite a bit of cells! Cash-flow testing traditionally assumes no new sales. For other modeling, you want to build in the ability to allow new sales.

For the health lines, you will not find a whole lot of interest rate sensitivity. There are definitely some economic variables that affect scenarios, but I think, at a minimum, you want to look at best-case/worst-case/most likely scenarios.

Turning to revenue for a bit, I think you need to make a couple of decisions early on in your modeling. These decisions involve the level of detail at which you want to project. Do you have a macro top-down approach or a micro bottom-up approach?

I think that will drive many of your decisions. If you're finding you do a plan at a high level and you can't explain variance well, I think you want to go to the other technique of doing a micro bottom-up approach. During some of my discussions I may bounce back and forth between micro and macro modeling. Each company needs to make the call there. At my company, we're kind of leaning toward the micro approach just because we found macro modeling doesn't necessarily lend itself to refinements over time. We're learning from mistakes.

Revenue Projections

Usually in the case of a micro model you'd say, "I have my existing business, and I will apply a case persistency for every case." This persistency is probably based on historical experience and some forward looking. Once you've applied that case persistency, you would then go into some type of a renewal rate increase module for that case based on its experience. You want to try to model this as close as you can to how your underwriters are renewing cases. So if you have a renewal strategy, you know you can relate that into the model.

In a macro model, premium persistency would encompass case persistency, rate increases, case growth, etc. Premium persistency represents the percentage of the premium base from the beginning of the year that will be there at the end of the year. So if you go with a micro model, you will have

to assume some volume growth on existing cases. Most of the group marketplace is tied to salaries, so as salaries hedge up, so will revenue.

In the macro model, that would kind of be contained within the premium persistency assumption. In the event you're doing something besides cash-flow testing, and you need new sales in there, I think you want to get your marketing staff involved here. They should probably drive the assumptions at a representative or office level. I think you get real ownership there. Also, you will want to look at any new product offerings, changes in case mix, case size, and so on, that you may be expecting.

Turning to the claims and reserves modules, you'll find that many will start from September 30 results and project out from there. When they get to year-end, they'll look for any significant changes in the fourth quarter, and if they don't see anything, they'll base their analysis off of September 30. This is largely done due to year-end crunches.

As you know, on the reserve side, you have two components. For LTD you have the incurred but not reported (IBNR) claims. This reserve is for claims you don't know about, but have occurred. Then you have open claim reserves already on the books that you have to model out. So we'll discuss how to best do these projections. For the short-term lines, it's a lot easier. We'll address that a little later as well.

For LTD, you want to look at premium bases by quarter of issue to gauge exposure. Reserves will be based on coverage; to the extent you don't know about it, you need to look to your exposure. You also want to relate claim levels to manual premium rates, not rates after discretionary sales discounts. You will need to look at a change to the manual relationship when setting up IBNR. On the open claims, use your existing studies and knowledge of your block. Your knowledge of how reserves run out over time is what you want to base your projections on. I would recommend looking at reserves by quarter of incurral and use your own company experience if credible.

A couple things you should keep in mind during the process is that you may want to modify new claims incidence and terminations notes. These different modifiers can feed into your scenarios that you're developing. An incidence modifier and a termination modifier could allow you to vary from your best-case scenario. In addition, LTD tends to have a seasonal pattern. Look at the seasonal pattern you have observed over time. You may want to model that into your quarterly projections.

Another variable you'll want to think about is qualifying periods and new product offerings. If you have a less liberal contract, that could affect your reported pattern development in the future.

On the expense side, I just want to talk a little bit about the loss adjustment expense or claims settlement expense -- a couple different terms that are used. This is the expense associated with paying future claims. So if your company goes out of business today, it has an obligation to pay claimants into the future. This expense does vary by the duration of the claim. New claims have a much higher cost, due to initial review, setup, etc. As the claim ages, it will eventually go into more of an automatic pay status where the cost is much lower. So I think it's somewhat of a natural conclusion here to say that expenses could relate to reserves by duration.

The following cash-flow exhibit (Table 1) assumes that you've gotten your revenue module and incurred claim module built. We'll talk a little bit about the expenses next. But here would be your output that you would have to match up with your asset model.

These are all hypothetical numbers, but this assumes $1 billion in reserves, $275 million in premium, and you're running that out over 20 years with no new sales.

TABLE 1

Scenario: Best Estimate ($1000s)
LTD Cash-Flow Projection -- Example
Beginning period reserves = $1 Million
Annual revenues = $275,000

Year Beginning September	Revenue	Benefits and Expense Payments	End Year Reserves	U/W Gain
1996	N/A	N/A	$1,000,000	N/A
1997	$275,000	$287,290	1,048,189	$(60,479)
1997	246,788	277,287	1,065,970	(48,281)
1998	211,676	261,618	1,058,084	(42,057)
1999	187,833	247,240	1,039,654	(40,977)
2000	166,608	233,472	1,008,022	(35,233)
2001	147,781	219,525	968,228	(31,950)
2002	131,082	205,716	920,361	(26,767)
2003	116,270	192,031	868,142	(23,542)
2004	103,131	178,612	815,126	(22,466)
2005	91,477	165,617	763,367	(22,382)
2006	81,141	153,177	713,383	(22,053)
2007	71,971	141,364	655,054	(21,064)
2008	63,839	130,207	613,327	(19,641)
2009	56,625	119,703	573,339	(18,089)
2010	50,226	109,855	530,288	(16,578)
2011	44,550	100,655	489,347	(15,164)
2012	39,517	92,088	450,623	(13,487)
2013	35,051	84,132	414,173	(12,631)
2014	31,090	76,767	380,006	(11,509)
2015	27,577	69,963	348,098	(10,477)
2016	24,461	62,809	319,024	(9,275)

FROM THE FLOOR: Regarding renewal assumptions, this is not like individual products where you're locked in on a premium. Why don't we just assume a 100% lapse at the next valuation and then just test the reserves? That, to me, is another possibility you could do with this model.

I think traditionally you see companies actually testing the renewal run-out. But what you're asking could be done by just assuming a 100% lapse at the first renewal. Then it is more of just an existing reserve test versus future incurrals. Again, this could be one of your scenarios tested.

MR. BORCHERT: Yes, the new sales are an area that I struggle with myself. A somewhat prescribed standard valuation law is that you should not assume new sales.

FROM THE FLOOR: Do you need to set up active life reserves?

MR. BORCHERT: For most group term products, you will not have active life reserves unless you have some extended rate guarantee periods or something for which you have explicit reserves established. For short-tail lines, the work in modeling is far less complex. You don't have the reserve dynamics you have to worry about. You know that, generally, reserves on short-tail lines will bear some resemblance to monthly revenues, so you can almost model reserves out as a percentage of annual revenues.

Again, some of the things with short-tail lines will overlap. You want to look at rate guarantee mix, renewal philosophy, and again you have that choice of a macro/micro premium persistency.

FROM THE FLOOR: Assuming no new sales, you should have no new expenses associated with those. The expenses are really a renewal expense.

MR. BORCHERT: I agree.

Let's turn now and talk about a life coverage option frequently offered in the marketplace: a waiver-of-premium benefit. This benefit allows a disabled persons to continue life coverage. They receive no monthly benefits.

You do not have a disability policy, but an insurance contract covers their death. The issue here is that it is a long-tail line. When they become severely disabled, these people stay on claim which results in a very long-claim duration. An issue here is data integrity; it is questionable. The claimants have no incentive to report the claim to you. They are not receiving any monthly benefits. It's not unusual to see very long lag periods between claim incurral and claim-reported date. There

are also issues with database accuracy. Are they closing claims that should be off the database? So I think data quality is more questionable with waiver claimants.

If you have LTD business with the same group that you're offering life business with, you should get some data improvement there. I still think you may have some problems.

For modeling this reserve out, it is very similar to LTD. You want to look at your experience. Most companies value the reserves based on the 1970 Kreiger Intercompany table. Use your revaluation studies on this block, and I would propose an analysis again by claim incurral. New claims would best be modeled based on incidence times face amount insured and terminations.

Let's talk a little bit about the expense component. (Refer to Chart 1.) There are a couple questions that we can talk through.

Expenses is an area where you want to pull your cost accounting department people and build off their knowledge. This is a renewal expense game. You want to model expenses as if they are being analyzed. Try to incorporate fixed-versus-variable splits or functional area splits. Expense reductions are difficult to project if you're actually not seeing them in recent years. I would use caution there.

Current-year claim expenses are a big part of these projections, so you should have an explicit assumption for this.

For commissions and premium taxes you have two approaches. First is to kind of use the aggregate block assumption that you're seeing. Second, an aggregate premium tax distribution or a commission distribution could be applied to premium levels. If you're in micro modeling, you can almost take a projected revenue for a case. You know the state in which the policy resides, so apply the state-specific rate as well as the applicable commission scale for that case. I think your accuracy will improve with these detailed assumptions.

Again, incorporate any incentive compensation bonus plans that you have in existence. If you're incorporating new sales for other modeling purposes, you largely want to use the current commission scales that you're selling.

I think Ken probably will talk income taxes through more than I will. You first need to arrive at statutory pretax. The largest tax difference is the reserves. Whether you model that in as a percentage of the statutory reserves to get that tax haircut or use a tax valuation basis, that's up to you. You need to get that into the model and incorporate it.

Table 2 shows which reserves you're testing and which you're not by statutory exhibit. If reserves are immaterial, they can be excluded. We include something such as this in our memorandum to show reserves tested versus those not tested.

TABLE 2

Reserves and Liabilities Summary

Co: ABC Life
Coverage: All
Date: September 30, 1997

	Asset Adequacy Formula Reserves	Tested Amounts Additional Actuarial Reserves	Analysis Method	Other Amount	Total Amount
Statement Item	**(1)**	**(2)**		**(3)**	**(1) + (2) + (3)**
Exhibit 8 (Part A - G splits)	$	$	(a) or (b)	$	$
Exhibit 9 (A - B splits)	$	$	(a) or (b)	$	$
Exhibit 10	$	$	(a) or (b)	$	$
Exhibit 11	$	$	(a) or (b)	$	$
Provision for Life Experience Refund	$	$	(a) or (b)	$	$
General Expenses Due or Accrued	$	$	(c)	$	$
Separate Account	$	$	(a) or (b)	$	$
TOTAL RESERVES	$	$	(a) or (b)	$	$
Interest Maintenance Reserves	$	$	(a) or (b)	$	$
Asset Valuation Reserve	$	$	(a) or (b)	$	$

Footnote: (a) Cash-Flow Testing
(b) Excluded from Assert Adequacy Analysis
(c) CFT Performed on expenses of future claim settlement

For the moment, let's assume that we have investment income forecasts. The end result of what you're trying to do is look at surplus projections and understand how your surplus varies by scenario and interest rate curve. You generally have these set and predetermined scenarios. You may run stochastic interest scenarios or selected other deterministic sets, but you want to bring your results together and look at it on a discounted surplus basis. Try to understand any relationships from the various runs. You really need to demonstrate that you have positive surplus over the majority of the scenarios.

Your liability cash flows could be in a different model. You may feed these underwriting cash flows into a vendor software system and combine them with the seriatim assets. I think Kenneth's company actually has that all with an "in-house homegrown" system. It will be interesting to hear his discussion on that.

On the asset modeling, I would encourage you to pull in your key investment folks to help with the assumptions. I'll walk through some of the assumptions that will be needed, that the investment people will largely dictate. As your system projects out quarterly cash flows, you may come to the point where you have excess or deficient cash-flow streams so you need to have some assumptions as to how to invest that excess cash and vice versa -- how would you divest if you needed cash to pay claims? Here are two examples of some reinvestment assumptions you could use. These are by no means the only approaches.

One approach would be to take the excess cash and invest it according to the asset allocation benchmark. The other approach would be to say, at that given point in time in the future, look at your asset distribution and reinvest it to get the portfolio back in line to the benchmark.

Asset default assumptions should be based on your own company experience. If your portfolio is not big enough to get credible data, you could look to some of the rating agencies for asset default assumptions. But ideally you'd want to use your own company experience by bond class.

Yield curve assumptions: you need to start from today's yield curve and forecast out what it will look like over a 20-year period. It is not an easy thing to do. I'd be curious to hear anybody's feedback that has been through this process.

You could use many techniques here for investment year-ends; an example is spreads to Treasuries. You need the yield curve to determine your market value of assets in that 20th year. You need to determine excess surplus.

Any mortgage prepayment risk you have -- bond calls, etc. -- should be modeled. You really need to look at the assets in your portfolio and include any callable features that you may have.

MR. KENNETH JAMES HAMMOND: First, I have notes on my background. I work for Sun Life in Canada. There is another company, Sun Life of America. There's a big difference.

Second, if you had asked me five or six years ago what I knew about cash-flow testing, I probably couldn't have told you very much. Hopefully, I've improved on that now.

Why do we do cash-flow testing? Are the reserves, future premiums, and investment income enough to handle the future claims expenses and income taxes? Are the assets that are backing the reserves sufficient? When we do cash-flow testing, we take the specific assets that are backing the group line and that's what we model going out ahead.

A couple of gentlemen asked, are you only doing the run off block of incurred claims, or are you trying to look at new business? That can be done either way. In fact, while I was working at our Boston office, we had to meet the Canadian requirements and all the NAIC requirements.

I want to try to keep my comments specific and applicable to the NAIC, but some of the work we do for the Canadian requirements will have applicability if you're a GAAP company or even if you're a mutual and your company wants to try to better understand its NAIC reported profitability.

One of the things that we look at from our cash-flow-testing runs is cash-flow match. We're looking year by year, and I'm talking now about being on an already open incurred claim basis. I'll talk about modeling future incurrals and future premium later. But for the assets that are backed by our current incurred claims, we look year by year at the investment flows under given economic scenarios and at the expected claims. We see what we're going to have to reinvest in -- our bonds, mortgages, or equities -- or whether we will have to sell any of our assets.

When you look at this modeling, if you see year after year that you're having to sell a lot of your assets, you're not matched very well. We've improved on this at our company, but we still have an interesting pattern. We'll sell $2 million for two or three years, and then we'll have to buy $2 million and reinvest.

It is tough to match it perfectly. But you should look at that, get a feel for it, and think about discussing this with other people in your company in other business lines or with other valuation folks in other companies. We'll get into this in a lot more detail further on. But if you have a good cash-flow-testing model, you can project the expected future earnings on this run-off block.

Also, if you look at the cash-flow testing with different economic scenarios of interest rates, inflation, and unemployment, you can predict how your future income on your run-off block will occur.

Regulatory Requirements

New York has specific requirements right now, and it requires you to run the New York seven (predetermined scenarios). We have a subsidiary company in New York where we do a lot of work. How many people currently write group LTD coverage? Okay, about one-third of the room. I don't want to mention names, but a regulator there looked at our actuarial memorandum and has decided we need to cash-flow-test a greater level of our reserves. Correct me if I'm wrong, but I think the level we're supposed to cash-flow-test is at least 90% of our reserves now. So regardless of your state of domicile, it is a requirement.

I'm also familiar with a company in a New England state, and the state commissioner required that it do cash-flow testing. He was concerned about how the company was matched. He wanted to look at the cash-flow testing on the runoff block by itself, under different economic scenarios. He also looked at the acquisition of new business along with the renewal of the current block with the appropriate lapse assumptions. So you may not be required to do it right now in your state, but it may be coming.

What do you need to do cash-flow testing? You need a good model that can take your current assets and project them over time. Investment income, as Kevin mentioned, needs to consider the prevailing interest rates at the time, given the mortgage and prepayment options. If the interest rates rise, you would expect call and prepayments to occur. You would have to be reinvesting many of your assets.

How many people here use "in-house" developed systems to do their cash-flow testing? It looks like 20% of the audience. We need projections of liability: the expected claims, claims expense, and tax reserves. Without going into details, we did a major LTD claim expense study last year and this year in my company. As Kevin mentioned, we found that after you get out beyond three, four, and five years, the expenses needed to handle those payments really drop down to almost a base level. We found that many companies do spend an enormous amount of reserves in the first two or three years trying to get rehabilitation, trying to get Social Security Disability Income (SSDI) assistance.

If you have a 24-month own-occupation (own-occ) benefit, then switch to any occ; with the change in definition, a lot of work is done to see if the person is truly disabled. I won't go into all the details, but we do two projections of claim liabilities. One is our best estimate of claim flows. The other is what we call an adverse termination. The adverse termination claim flows use approximately 80% of expected claim flows. You need to use those assets that directly support those assets you are testing. Seriatim data are preferred in all the bonds, mortgages, real estate stock, etc. If you don't have this going on, you have a very crude or very rough model.

I'd like to look at the book values and the market values of the assets. We run 13 different economic scenarios and different patterns of interest rates and inflation rates. You need to specify default rates by bond quality, stock market performance, real estate performance, inflation, etc.

What does cash-flow testing tell you? By analyzing the output of a block of business, liquidity concerns or mismatching of asset/liability cash flows may become apparent. Statutory reserves may be sufficient but require either sale of assets or substantial reinvestment in certain time periods.

Even if your NAIC reserves are plenty sufficient and your regulator doesn't care if you do it, if you plan to exit a line of business, you should know if you will have to liquidate a substantial portion of your bonds and mortgages. If you have a lot of real estate or stock supporting LTD lines, you need to make sure your investment area is aware of this.

You need to try to understand the sensitivity of the different variables involved. Some economic scenarios may have little effect on your performance if you're well matched by duration, unless you get one of those scenarios where the interest rates pop up and stays there or pops down 3% and stays there. If interest rates drop down 3% and stay, people will repay their mortgages. They'll exercise their bond calls and you will have to reinvest at substantially lower rates.

We do run our adverse termination scenario and our expected scenario under all the economic scenarios. One of the key things that should stand out is what we call our best estimate of the future. We freeze the long-term reinvestment rate unless we think that it's really going to go up 0.5%. We also use our best estimate on the default rates on bonds and our best estimate of the investment expenses on mortgages and bonds. We try to look at those results.

We also try to determine how much of the assets backing the reserve line we really need to mature the obligations of the block. Let me be a little more specific. If you have $100 million of NAIC reserve in group LTD lines, and you have what you think is a very good projection on what the tax reserve on that closed block will be every year going out for 20 or 30 years, and you have a good

projection of the claim forecast, when you run your cash-flow-testing model, it should project the taxes paid each year. You'll be able to see what the expected reinvestment is or whether you will sell bonds or mortgages. When you get done, you'll find a certain amount of surplus left. You should find a sufficient amount of surplus out there in 20 or 30 years.

If your model works properly, you can take and discount back to the current point in time and find what we would call a break-even level of assets. It might be typical that if you have a $100 million NAIC reserve, you may find that you only need $85 million of those assets to actually mature your claim and your tax obligations on that block. If you start out running your asset model, and instead of taking all the $100 million of assets, you only take $85 million or 85% of each asset supporting the line, you may find that your surplus at the end is zero. You found out how many assets you really needed, and you want to report to management that $15 million of this $100 million will eventually be returned to the company. That's the present value, and we will get that back along with invested income.

Furthermore, if you set the tax rate equal to zero, you may find that you only need $80 million in assets to mature the claim obligations. This tells you that you are holding $80 million for claim obligations and $5 million for future tax obligations. Depending upon how you modify your NAIC reserves and your tax reserves in the first two years of incurral, or whether you anticipate offsets for SSDI, or whether you only take the offsets as they actually occur, you may have a minor amount of taxes paid, or you could have a very substantial amount. I'm aware of companies that tried to delay taxable income. They would only take Social Security reductions to their tax reserves when SSDI awards were received. You may find in your modeling that as much as 10% of your liabilities is for taxes.

Furthermore, starting from that base run, if you change one parameter at a time, and if you put in expected default rates on your bonds, you can see how much more in assets you'll need. If you put in an adverse claim termination scenario, you will see the impact in the model output. If you run different economic scenarios with interest steadily going up 1% a year for five years or 0.5% for ten

years etc., you can see how sensitive your break-even assets are under each scenario. Be careful that you don't simply just run your base run with everything as expected and then with a provision for adverse deviation (PAD) or margin in every assumption. Many complex covariances are going on in the model.

As a brief aside, working for a Canadian company, we actually set our Canadian statement reserves by using the cash-flow technique with an appropriate PAD or margin on each assumption. We also have tried to use our best estimate of what the default rates are, or the investment expense for claim, so we can quantify the provision for adverse deviation (PAD) in the reserve. I would suspect that if you could do this, your own management would like to see reserves stated on that basis to get an understanding of margin levels.

Canadian regulations require a confidential report showing embedded value. This is the difference between our statement reserve and our best-estimate reserve by source: asset default, morbidity.

If you are doing cash-flow testing for a large company, you can combine results for different blocks. If one particular scenario causes a problem in LTD, it may not be a problem on your life or annuities. Providing you're in one company in the general account, you may legally separate the assets internally and say that some assets are supporting group LTD and some are supporting individual health. These are supporting but legally they're all there. You can combine the results under each scenario, and you may be able to avoid holding extra reserves due to cash-flow testing.

MR. ROBERT M. SACKEL: Don't you have a requirement to perform cash-flow testing on major lines of business? An example is individual life separate from group health. Don't you have that requirement? While, overall the company, for statutory, might be fine, you might need the specific additional reserves for a major line of business.

MR. HAMMOND: Donna will talk about the NAIC regulations. I think I'll let her comment more at that time.

MR. BORCHERT: I agree with your statement.

MR. HAMMOND: One other point that I'd like to point out that I've been emphasizing is the projection of claims and tax reserves. It's also possible to project what the NAIC reserve would be year by year.

Even if your current assets supporting the line are sufficient, that is, your ending surplus 30 years later is positive, you could have what we call a temporary technical insolvency. This would occur if you have a substantial line or portfolio in real estate, or stocks, and you have a 10% correction in the stock market for 14 years. You could have a situation in which the market value of assets out there at duration 5 or 10 or 15 is less than your NAIC statutory reserves. So you might want to look at a couple runs such as those. Also, if you have many bonds and the interest rate drops down 3% and stays there, the market value of your bonds will decrease quite a bit. You want to be careful if the market value of your assets is less than your protected statutory reserve. Discuss this with the appointed actuary in your company. You may need to take some kind of corrective action.

Regarding general notes, the modeling may be performed either life-by-life seriatim or on a group basis. If you have a huge block and you want to do 20, 30, or 40 runs with each economic scenario, you may need to expand into age and duration bands.

I guess I've already jumped into the general. I just couldn't wait, knowing that your book value or market value assets should always be greater than this statutory reserve. You need to discuss this with the people within your company. In certain scenarios, this is not true.

This should be addressed in the actuarial opinion or memorandum. You may have to hold additional reserves in Exhibit 9 under the description additional actuarial reserve. Donna may have a lot more of what's to come.

Regarding LTD specific, only claim reserves are usually modeled. We do try to model the unreported business. We do try to model future incurred business, but we do that separately. We do it as part of our dynamic capital adequacy testing. The NAIC calls it dynamic solvency testing. As Kevin mentioned earlier, the same model should be going on in both areas. If you're not overseeing both parts of the picture, talk to the people who are doing that.

I am the group valuation actuary at my company. I talk with those responsible for the individual line, and those responsible for the individual annuity. They use the same underlying asset projection model. With their experience and my experience, we have helped each other.

Just some notes on LTD. Make sure you are considering any cost-of-living adjustment (COLA) benefit increases in the claim forecasting. Maybe you're not, or maybe it's not considerable. Perhaps only 1%, 2% or 3% of claimants have this benefit, and it's just not material. But make sure you're aware of that and if you ignore a certain situation, make sure it's really not relevant or significant.

Regarding expiring offsets on SSDI -- children's benefits expire some time between 18 and 21, or 22 if they're full-time students. I should also note some state benefits: California has a 52-week disability benefit. New York, Rhode Island, New Jersey, and Puerto Rico also have seven-month or six-month benefit periods.

You may have a claim come in. You may be receiving a file on that. You need to be aware of when these benefits expire. You may have a little bit of a jump in claims for those individuals.

Again, for each scenario two sets of claim termination rates are used. I've done a lot of work with this. If you are only doing one set of probability rates, you're having, in my mind, a little bit of a problem. Let me try to illustrate this with an example.

With best estimate of liabilities, you basically need two sets of probabilities. One of these will be your tax valuation Qx's or termination rates, which are claims beyond two years of duration. This is probably the 1987 Commissioner's Group Disability Table (CGDT) unless you're modifying claims for up to five years. Most companies' interpretations of the tax law are that if you make necessary modifications on an NAIC basis, you'll be required to reflect that as well on a tax basis.

So if you take your open claims and you have your starting tax reserve, and if you have the greatest misfortune to have everybody still alive and disabled one year later, two years later, or three years later, etc., you could calculate what the tax reserve would be in the event of zero terminations from death or recovery. Of course, you need to consider benefit expires.

To make it really simple, let me take a specific example. Suppose we have a block of 100, 25-year-old males who just became disabled. Assume they have a benefit to age 65 with no COLAs. We could determine the tax reserve just by changing the valuation date for the next 40 years. We probably would find that the tax reserve, if there were no terminations and death increases, would increase for 10 or 15 years and then decide to come down.

We then would take that vector or set of tax reserves if there were no terminations. We would say, given your best experience for these 100 people, we think that the termination rate in the first 12 months will be 15%. So we'll take our "preliminary tax reserve" or "worse-case-tax reserve" modified by 85%. Then, if your statistics say that of those 85 lives, 73 will still be around 24 months from now, we would take 73% of that.

So what we have is our best estimate if we were doing this run-off block of what our tax reserve will be every year between now and 40 years out. At the end of 40 years, of course, it drops to zero when the claims expire.

MR. BORCHERT: How does that tie in with your statutory reserve projection? You almost have to have some relationship to make sure tax reserves are not greater than statutory reserves. Does that happen?

MR. HAMMOND: It almost will happen for us. We use the exact same termination rates on tax reserving and statutory reserving. With the tax AFIR being generally quite a bit higher, higher interest rates imply that the tax reserve will be less. Also, the tax reserves don't allow expense loads on LTD.

I have a projection of tax projections, but I could have done a projection of the NAIC statutory reserve as well. That would be very helpful to have. It should be automatic but that would be necessary for you to do statutory income projection on an NAIC basis.

So if you had a projection of tax reserves and a projection of the NAIC statutory reserves, feeding that into the model under your best estimate of future termination rates will let you see how your embedded value in NAIC reserve is released over time. This is very helpful if you're looking to buy or sell a block of LTD. When the income can be reported may determine when it can be paid out in dividends or when that money can be freed up for other uses in the company.

Also, even if you plan to continue doing business without buying or selling any blocks, your knowledge of the embedded value in your NAIC reserve will let you understand whether your NAIC reported gain or loss is being distorted by changes in this embedded value.

The real estate holdings should be reviewed to see how they are performing. Some companies may take on a more aggressive approach, but that's one thing that we tended to do.

It is important to understand the relationship of cash-flow testing to other similar types of work that are usually performed by insurance companies. They all involve essentially the same process, and

they should use the same underlying model. If different people in a department perform different functions, they ought to talk to one another and make sure the work is done consistently.

FROM THE FLOOR: What is a PAD?

MR. HAMMOND: The PAD is the provision for adverse deviation. When we have adverse termination rates, we talk about MAD as being the margin, which is 80% of expected. The PAD is the dollar amount. So the total dollar amount of the PAD is what we call the embedded value in the statutory reserve.

MS. DONNA C. NOVAK: We're going to change focus quite a bit here. I'm going to talk about some emerging health issues that we want to at least make you aware of. Although we have no answers at this point in time, this is something that's probably going to be developing quite quickly during the next nine months to a year.

When I say health, I will be talking about medical. Kevin and Kenneth have been talking about LTD. When I say health, I'm primarily going to be talking about medical, although LTD will be included also. But these are really some issues that are going to be new for the medical arena and probably not really that much of a change from what you've been doing on LTD.

I have been working with some of you for the last three or four years on risk-based capital or solvency standards with the NAIC. When we looked at solvency standards, especially in the health area, one of the things that became obvious when we were talking about solvency for health entities is that many health entities have a lot of these assets tied up in nonliquid assets, especially the more provider-oriented health insurers, such as physician hospital organizations (PHOs).

In the health area, we can see a large need for looking, therefore, at liquidity, liquidity issues, and health liquidity standards. This, of course, immediately leads us to some sort of cash-flow testing when we're looking into the future. The goal of a liquidity standard would be to test against liquid

assets being in the position to pay for liabilities that are due. In other words, we immediately get into cash-flow testing and cash needs going into the future on an ongoing basis without selling assets at a fire sale level.

When we're looking at liquidity standards in combination with solvency standards, with risk-based capital, we find that there are already a number of related tests or criteria, some of which we've talked about here that are already in place and are being used. There's also the capital requirement for risk-based capital. This is the C-3 interest rate risk and the life formula -- the Standard and Poor's ratings that look at liquidity, as well as capital and solvency. Of course, Section 8 opinions and the New York seven and some of the things that we've been talking about so far in this session all deal with projecting cash flow and liquidity needs.

When we started working with the NAIC on liquidity risk versus solvency capital risk, one of the first questions was, do we increase risk-based capital to cover the need for liquidity? Or do we have a separate liquidity cap? Also, how much does the current C-3 risk in the life formula and in the P&C formula already account for some of the liquidity risks? We have found the answer to some questions but not all of them.

One of the accepted proposals that the American Academy of Actuaries has made to the NAIC is that the liquidity test that will be developed for the health formula, the life formula, and the P&C formula will actually be a separate test. It will not be an increase in capital. Just looking at the health side, having a larger hospital doesn't mean that you've really protected against the liquidity problem. It just means you have a larger hospital. I think that the regulators understand that that's true on all lines of business, but it certainly was true in the medical area.

Although both tests will fall under the current model law for risk-based capital, and therefore will trigger some of the same regulatory intervention levels that the capital requirements do, it will be a separate test. Technically, you could have enough capital to not fall within a regulatory

intervention level on risk-based capital, but you could hit a liquidity level that would trigger regulatory interventions.

Besides the structure of the risk-based capital and the fact that liquidity will be tested outside of risk-based capital, two other issues have been under discussion for the last year. One is the confidentiality issue. It is really seen as being a much more sensitive issue than capital levels, especially by some of the life carriers. They think that if they hit a regulatory level for capital, it is not going to create as much of a concern within the marketplace as if they hit one for liquidity.

Therefore, being perceived as having a liquidity problem may actually complicate the problem and create a run on the bank or create some concerns about a company within the marketplace that would increase and therefore accelerate a liquidity issue. Also, there has been a lot of discussion as to whether there can be one framework for liquidity testing for P&C, life, and health. The conclusions have been drawn that although you could have the same general framework, and I'll talk about that a little bit, as soon as you get into the details, they are completely different issues.

At a very high level in life companies, liquidity risk comes from a run on the bank and the long-term durational mismatches, some of which we've talked about here, and potentially the loss of a large client or a block of business. P&C liquidity risk comes from a catastrophic event: a hurricane, a long-time duration mismatch also (because of the long-term tail), and the loss of a large client or block of business. Whereas in the health area, liquidity risk comes from unexpected high claims that were not anticipated when pricing or, again, the loss of a large client or block of business.

Each of these areas will be looked at independently both by the American Academy of Actuaries and the NAIC. That's important because right now they've been put on different time frames. The priorities on the life risk-based capital side, both at the NAIC and the American Academy of Actuaries, which supports them right now, do not include looking at liquidity risk. But on the health side, it's deemed to be very important because of the emerging issues at the federal level, granting

special provisions for provider-sponsored organizations when looking at solvency as well as liquidity requirements. So the health area will be moving forward to develop a liquidity standard.

Now for liquidity, the structure of that standard right now has been agreed upon at a very high level. A quick ratio would be set and if a company passed that quick-type ratio, then there would not have to be any cash-flow testing done.

But as a company demonstrates that it has a higher and higher potential for a developing liquidity problem over the near time horizon, then more and more cash-flow testing would be required. It has not been determined what level that quick ratio would be at or exactly how it would be structured. If a quick ratio is set too high, there will be too much of a stigma attached to not passing it and having to do the cash-flow testing. If it's set too low, it will require extensive cash-flow testing where none is really necessary. That costs, as you are aware, a lot of money and company resources. So the setting of that quick ratio and the way it's structured will be very important as we go forward.

The timing of the project on the health or medical side is that it will be put on a fast track. Now this has happened a couple times before in the history of this project. Those of you who have noticed say we may be crying wolf again in this case, but we hope not. The sooner that we get a good liquidity standard and get it out in the marketplace, the more we'll all know how this will be structured and what we have to live with.

A meeting has been scheduled for mid-October 1997 with the American Academy of Actuaries and representatives from the NAIC to start this process. I would anticipate that by next spring or summer that a liquidity formula will be in the process at the NAIC of being refined and approved, and I hope it will be passed in the 1998 fall or winter session. Now the life and P&C carriers will be following suit based on their own time schedules. That has not been planned out at this point in time.

As I say, we don't have any details beyond that, but we want to make you aware of this as an emerging issue in case you want to get involved. The trades are very involved in this process right

now as are some carriers who are sending representatives to meetings. They know how much this will affect them going forward, and they want to participate in the process early on when there's still an opportunity to have an effect.

MR. THOMAS J. STOIBER: This is an LTD-type, cash-flow-testing question. You run it through the test cash flows, and you're not having a particularly good year. In fact, a couple of not really great years are on your LTD block. Maybe rate increases haven't been put through. Some negative cash-flow years are five or six years down the road. But in your 10th and 20th years, there is positive surplus.

Is that possible under cash-flow testing? The reason I ask that is obviously you have the right to change rates. Most companies these days are changing their claims practices. They believe they will make money in this business, or they wouldn't be there. Why do you even need cash-flow testing on the morbidity side if that's the case? What really do you do if a worse-case scenario shows you still have positive surplus in the 10th and 20th year, but you have even more negatives? What does that all mean? What do they do when they run tests that show they have some problems?

MR. HAMMOND: I assume that you're doing cash-flow testing trying to consider the renewal of the existing business and your planned new sales.

MR. STOIBER: No new sales.

MR. HAMMOND: Alright, you're just taking your open and current claims, any IBNR, and you're also looking at your current block with persistency assumptions and expected rate changes.

MR. STOIBER: Right. This is the typical cash-flow testing that is a scenario of a book of business that under some of the New York seven tests will have some negative situations, six, seven, eight years out. You know that your company will stay in this line of business forever. You know that the company has the ability to change rates. You also know that you have the best practices as far

as paying claims. A fraud unit is coming in. The big boys are able to sell this at this rate. This is a real situation that happens every day. You believe that if your competitors can make money at this, so can you. You know that you will be able to turn this around.

So you're making some assumptions. Here's the question. Can you make such assumptions that you will be able to turn this thing around and always be positive? Can you do that even though you're negative for seven, eight, or ten years?

MR. HAMMOND: I would try to look at your claim reserves for business already incurred separately from your future business, even though you might want to include both together. You usually can change the premium rates, but you should not guarantee rates more than 12 or 24 months in advance.

You might have to look at the time period until you could change rates. You'd be able then to figure out, given the expected incidence in the way the current claims are coming in, what kind of rate increase you might need. You face a problem if you think you need a 15% rate increase, and your marketing or sales organization says you can't get more than 5% or 6%. Then you have a real problem.

MR. STOIBER: Let me focus the question a little better. You're doing cash-flow testing. You have a plan in place. You believe that you can raise rates and improve your claims practices on your closed book of business, whether it's closed or not. The clients are closed. You've done the best job you can, and you say it will take several years to get these rate increases through, and several years to get the claims practices. You've done your projections and they're negative for six or seven years. They then turn positive in the later years because you see the effect of these rate increases going through, and you see the effect of some improvements in your morbidity experience because of all these claims improvements that you're putting in. So you've done all of your homework. You've made all your assumptions, and they're all real. You're sure that you have negatives, at least

in some of the New York seven testing seven or eight years down the road. But your assumptions say that they can and will turn positive in the 10th and 20th year.

So you have a problem and you have to go to management and say, "I need to put in reserve strengthening here, because of a five- or six-year problem." Or do you just sign off this statement and put it in your statement of opinion and wait until next year?

MR. BORCHERT: I don't know what specific assumptions you're using. Is this a claim run-out issue, or is this a new business or renewal issue? You make it sound as if it's a renewal issue. You're phasing your rate increases in and you're not getting there quickly. You're getting there in a five-to-six-year period. I guess I would question why it takes that long to get there.

MR. STOIBER: Well, let me be very blunt. LTD business has not been necessarily good for everybody. Let's say you're working for one of those companies and you have had some bad years. You have some current negative problems. You have a problem situation. But you will take whatever steps are necessary to turn this line of business around. You have some negatives going forward for five or six years in cash flow. Management has convinced you that it can turn this around. Whatever the business plan is, be it rate increases, be it change in practices, and fraud units, or whatever, you're going to turn around.

I would say that one in three LTD companies has been in this situation in the last four or five years. What do we do?

MR. HAMMOND: This isn't an official Society viewpoint, but you probably have rate guarantees and, depending on your contract, you probably aren't limited by the rate increases you've been asked for when the guarantee period ends. If you have the chance to rerate business in the next 12 to 24 months, I believe that given your current rate structure and your expected incidence, what's happening is you still are having negatives. Then I think you'd have to hold additional reserves up until the point where your rates renew.

Now, you have another issue with what to hold up until the point when these cases come for rate renewal. Well, 10-20% increases will take three years to get it where it belongs. At least legally your company could, at that rate renewal point, ask for a 10% or 12% increase. If the state regulator seizes your company right then, it would try to honor the existing commitments to the rates.

I'd look from at least that angle as a minimum. We have discussed this and we do look at it that way. I think that the current NAIC reserves on your approved claims held some fairly large margins. But you have to look at your future incidence in claims, too. That's my point.

FROM THE FLOOR: If you've done cash-flow testing, and you've done your different scenarios, and you see a positive ending surplus but a negative middle-year surplus, do you need to take corrective action, or can you sign that statement and just fill it out and mail it in? That's really the bottom line regardless of the coverage. If that's like a noncancellable individual disability line of business, where you don't have the chance of raising rates, I kind of wonder if the actuaries allow that. Cash-flow testing is statutory because it's allowed to take much liberty in making assumptions about the ability to improve the claims process.

That's the only way you can improve that line of business, unless you sell rate increases, of course. On these other lines of business where you do have things such as rate guarantees, I just use that as an example. But I'm sure that actuaries here have seen situations such as those, or will see situations where they have negatives in the early years. Are you supposed to do something about it? When you look at it from the gross premium valuation standpoint, your reserves are equal to the present value of future expenses and losses minus the present value of premiums. I just told you that the 20th-year surplus is positive. So positive future years are offsetting negative early years. According to the valuation standards, you don't have a valuation reserve need that's over and above your statutory need. But cash-flow patterns show that you have negatives in mid years. I'm just wondering, what I am supposed to do with that.

MR. BORCHERT: To me it would seem that you have a management issue, too. Management will know that it needs to raise capital, whether it's a 20-year or a 5-year problem.

I think you need to note that. Communicate to management and probably note in the memorandums that early years had negative surplus. You may want to address how you're going to deal with that. To me that would be the logical thing to do. If you are saying that you have a capital problem short term, and long term you don't, I would question how you will raise the capital. Are you a stock company, and can you get an infusion?

MR. HAMMOND: Again, I just would summarize it in my opinion. I don't know if others have it. You have to look at the worst-case scenario. If the regulator went in and seized your company, could he take the assets that are backing your line up to the point where a case is coming for rate renewal and guarantee it?

Is it likely that those assets will cover liabilities under these various scenarios? The answer is no, under some scenarios. Then you probably have to advocate reserve strengthening. This situation might really be good to mention to the ABCD. Ask the people there, if you're the appointed actuary, how do you handle this? Or talk with others in your company. It would be hard for a very small company to say, we'll get there, and you are on this block.

FROM THE FLOOR: Is cash-flow testing done at a total company level so that although you might have a deficiency in the years 2 through 8 on your long-term disability line of business, can you "borrow it" from your company's individual life business so that you just report in total? Has that been just a question of management conversations between the executive vice president group and the executive vice president individual.

MR. HAMMOND: If the business is in the general account, although you may segregate assets for testing, you can aggregate all parts of the company together to decide whether extra contractual

reserves are required due to cash-flow testing. But you may have a more conservative company practice that says that you don't want that.

Obviously, you must be very careful if you have many subsidiaries or related companies. You talked about the same assets and the exact same company.

MR. BORCHERT: I would agree with that. I think you can draw from margins and other lines to back deficient lines.

MR. HAMMOND: But that would be good to write up in the actuarial opinion memorandum for that company's files to make sure that management is aware of that.

MR. PAUL E. HANSEN: It doesn't seem like anybody wants to talk about this too much. I do have one instance that I was involved in within the last five years, and the claim reserve was short. It did not make a difference in terms of what rating agencies or everybody thought about it. We did a gross premium valuation and were able to prove the reserve inadequacy was worn out within the year. The company was going to recover from rate increases and the actions it did take.

This is very short. This is not five, six years. This is within a year. We found that the politics of the situation almost dominated everything. If people in the state were unhappy with the company in some way, they would push it to the point where we had to restate the reserves. But if you look at all the requirements in the NAIC, instructions etc., we shouldn't have had to.

So what you're talking about is a real problem. But I think the politics of the situation may be more of what dictates what you do. Or how you handle it. It was not a comfortable situation for about a year. But once we could prove to the states that we could make the money, and the deficiency was gone within the year, everything kind of went away. I don't know if anybody else has any experience with these things.

MS. NOVAK: I know I promised to only say we don't know yet. But my experience in working with regulators tells me that regulators will not be willing to wait 20 years. I think what you're saying is that even when it's within a year, they're going to start getting nervous. From a regulator's perspective, they want to know that, because a lot can happen in five years. I would not want to sign an opinion that guarantees that this company will be financially sound in five years.

MR. JAMES A. GEYER: I've been involved in cash-flow testing for many years, especially on the group pension side, and only recently on the health side. But I have had experiences with negative interim values. I believe California is one of the states that specifically asks whether there are interim negative values in your projections. They take great interest in that.

Generally, my experience has been that the regulators are interested in both the existence of the negative interim values and their magnitude. They ask the valuation actuary to opine the meaning and what will be done about those interim negatives.

I generally view it as an issue of looking at the magnitude of those negatives relative to your projected surplus position. Clearly, if you project that in four or five years, the negatives will be so great that they could take up very much of your existing capital, or your then-projected capital, I think the regulators will be very uncomfortable with that and will ask for some sort of plan and possibly immediate reserve strengthening.

If the negatives are fairly insignificant, especially relative to surplus position and other lines of business earnings, then it's not an issue. But there are states that are very interested in those interim negatives. Connecticut is another one. Just being able to satisfy the test on a gross premium valuation basis or on a present value basis, is not enough for most states.

I think the Actuarial Standards of Practice also guide the valuation actuary to consider negatives. So they don't really provide guidance as to what to do with them. But they do suggest that in

looking at the cash-flow tests that actuaries should look at the interim values as well as just the present value. Actuaries should understand the meaning and implications of those.

A question was asked about blocks of business. This may be outdated, but my understanding of New York regulations was that you had to do cash-flow testing for lines of business separately. You couldn't say that individual life is fine and health is a problem or LTD is a problem and offset the two. My understanding is that you had to look at lines of business separately. I think many state regulators, even if they don't have that in their regulations or laws, expect the company to look at it that way.

MR. FRANK KINSMAN: Have you or do you know of anybody who has ever found or assumes a correlation between the termination rate and the LTD claim reserve and the interest rate assumption on the asset side?

MR. HAMMOND: I believe high inflation time periods increase the LTD termination rates -- unless your benefits have COLAs and are increasing. We don't have hard studies to support this.

MR. BORCHERT: I guess the only comment I would add there is I think it's more economic. A depression would cause lower terminations. I think it's more economic than the interest. But there is a relationship there and it's difficult to get your hands around it.

MR. HAMMOND: I also have the feeling that after five years there's probably not much you can do about the termination rate. It's mostly death five years on out.

MR. SACKEL: One of the things that is a continual challenge, just in a theoretical sense, is the issue of regulatory cash-flow testing versus the practical issue of cash-flow testing for management. Do you have a problem or not?

For example, you said to Tom that you need to let management know because you may have a problem if you have a mismatch. One of the issues that you don't know is how much surplus they have. For example, they may have a significant amount of surplus, a significant amount of assets above which they haven't modeled. Perhaps there's one analysis for regulatory, but in a practical sense, if there's sufficient surplus and sufficient liquidity, they would not have a problem from a management standpoint.

Basically, I'd like your thoughts on the regulatory-versus-the-practical use in really understanding the real issue of problems that the company has.

MS. NOVAK: I think management is very interested in what line of business is giving a return on capital. It will be more interested in a particular line having a problem even more than regulators who can look at the big picture. I think regulators want to look at each line of business. Management definitely does because if it is losing money on every policy it sells, it may not want to put quite as much money into marketing.

MR. HAMMOND: I guess I would say that to protect yourself, make sure that you have a good understanding as best you can get and write up and inform management and try to look at the modeling of new business coming on. It will cause a strain. Somewhere your appointed actuary or chief actuary needs to look at all lines of business and see where surplus is going as well as where your risk-based capital requirement is going ahead.

FROM THE FLOOR: Looking at solvency issues, particularly liquidity issues, I saw no addressing of reinsurance by using reinsurance as a trade-off and changing potential liquidity issues for another set of problems that may be more manageable. Are you examining reinsurance and the impact of reinsurance?

MS. NOVAK: Well, as I say, I'm sure you're aware that reinsurance does decrease capital requirements. So liquidity aside, it is taken into consideration in risk-based capital.

FROM THE FLOOR: Yes, but it can be a liquidity item also.

MS. NOVAK: Correct. We don't know yet, but that's a good point. Those are the types of issues that have to be taken into consideration, or at least thought through.

First is the quick ratio and how that quick ratio is structured. Then how much detail do we want to put into that? Once we identify a problem and get into real cash-flow testing, reinsurance will certainly be taken into consideration. Appropriate reinsurance, as you know, can solve a problem.