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THE VALUATION ACTUARY

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This session describes the Work of the committees of the Society of Actuaries and American Academy of Actuaries in advancing the role of the valuation actuary. Included will be discussions on:

- o Current status of the valuation actuary movement
- o Standards of practice
- o Qualification requirements -- unresolved issues
- o The valuation actuary in Canada

MR. WILLIAM CARROLL: I am an Actuary on the staff of the American Council of Life Insurance. Art Cragoe is a Senior Vice President at Franklin Life. He is also a member of the American Council of Life Insurance Task Force on the Valuation Actuary. This is an industry task force considering the issue from an industry perspective. Ed Silins is a member of the American Academy of Actuaries, Committee on Financial Reporting. He is chairman of that committee's drafting group. Our recorder is Charlie Peirce from John Hancock.

Historically, the actuary responsible for the statutory valuations in the United States has operated within a narrowly defined structure of responsibilities and duties. For a long time, the actuary merely had to make sure that the valuation process was performed accurately, and that the reserves established by the company met the minimum legal requirements. These minimum requirements were precisely defined in terms of prescribed methods and specified interest rates and mortality tables. In June, 1975, the National Association

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of Insurance Commissioners adopted a requirement that the annual statement must contain the statement of a qualified actuary setting forth his or her opinion relating to policy reserves and other actuarial items. Among other things, the opinion paragraph should indicate that, in the actuary's opinion, the reserves and other actuarial items make a good and sufficient provision for all unmatured obligations of a company that are guaranteed under the terms of its policies. In my opinion, this represents the formal beginning in the United States of what has come to be known as the valuation actuary concept.

The concept of the valuation actuary is in an early evolutionary stage in the United States, and even within the actuarial profession, there is no universal consensus as to the precise meaning of the concept. However, there are a few basic ideas which most people would agree are a part of the concept of a valuation actuary. First, the rendering of an opinion as to the adequacy of reserves is so important that the directors of a life insurance company should be more explicitly involved in the selection of the actuary who is given that responsibility.

Second, with the higher level and increased volatility of interest rates of fixed income securities and other assets, it is no longer satisfactory for actuaries to make judgments about the adequacy of reserves without taking into account, where appropriate, the nature and term of the assets supporting the reserves.

Third, the qualification standards for valuation actuaries would be established by the profession and the regulators.

Fourth, standards of practice would be established by the profession.

Fifth, the required public statement of opinion would include a statement that current standards of practice were observed when making tests and forming judgments.

The concept, if it is to succeed, must rest firmly on three foundations: an adequate body of knowledge, high standards of practice, and solid law. All three of these pillars must be constructed somewhat simultaneously.

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The primary players and stakeholders, who together will build this foundation, are ourselves, the members of the actuarial profession, the industry that we serve, and the public servants who regulate us.

We will discuss how each of these groups is constructing these foundations with an emphasis on critical issues that are as yet unresolved.

MR. EDWARD S. SILINS: Before I talk about the Academy's activities, I would like to digress a minute and note that physicists have long been searching for a unifying theory which will unify all of the various forces of nature: gravity, electromagnetic, strong and weak forces of the atom. With a little bit of tongue in cheek, I am referring to the entire field of asset/liability matching and the revision of Recommendation 7 in the same format. Since it is so all encompassing, I would like to refer to it as the theory of everything. This is what the physicists are calling their theory of everything, which will unify all the forces of nature. They have been looking for this theory of everything for seventy-five years and have been unsuccessful so far. Hopefully, actuaries will be a little more successful in their endeavors.

With that background, I will discuss the status of the activities of the Academy and, in particular, the Committee on Life Insurance Financial Reporting Principles, of which I am a member, and cover some of the historical background. Our Committee has generally supported the Joint Committee and its report on the role of the valuation actuary, which was submitted in February, 1985. Among other things, there were two basic pieces to that proposal. One was a formal appointment of the valuation actuary, including qualification standards. The second was that there would be principles which would be developed by the Society of Actuaries and standards of practice which would be promulgated by the American Academy of Actuaries.

Our writing task force was assigned to focus all the work which had been done up until mid 1985. We put together a discussion draft on the standards of practice for the valuation actuary and released that in July, 1985. The opinion was going to state that the actuary has looked into his crystal ball and determined that there will be sufficient monies on hand to pay all the bills as they come due. That, in a nut shell, is the essence of the opinion.

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Our Committee tried to be reactive rather than proactive. It was not proposing that the valuation actuary concept move forward at any particular speed. Its intent was to be ready when the time came and standards of practice were required. The July draft dealt primarily with the C-3 risk which was our charge from the NAIC Life and Health Actuarial Task Force. It was a request from that task force which formally sent us on our way. We realized that theory had not evolved as far as it needed to support standards of practice, and that there were, in fact, many unanswered questions. We noted that in the introduction to our discussion draft.

We also tried to limit the actuary's personal liability by adding the following limitations section to the opinion:

This opinion is updated annually as required by statute. The impact of unanticipated events subsequent to the date of this opinion is beyond the scope of this opinion. The cash flow portion of this opinion should be viewed recognizing that the company's future experience will not exactly follow all the assumptions used in the cash flow projections.

We hoped this would limit the certainty which otherwise might be read into the opinion. It borrowed heavily from some accounting literature on the subject of forward projections.

In addition, we broadened the reliance section beyond reliance on others for the inventory of policies. We pointed out that there might be reliance on an investment officer for the quality and distribution of assets or the investment philosophy. There also might be some reliance on other corporate officers for dividend projections and other material items and assumptions that have to be built into the report. In addition, we changed around the language from the current "good and sufficient" to "appropriate according to present practices."

As as you might have guessed, there was a lot of response. We received almost forty responses from the Academy membership, an unusually large number. Those responses were very valuable and expressed a variety of opinions.

Those items of the discussion draft which generated the most discussion were the following: First, who should pick the investment scenarios? Our Committee

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had proposed that the NAIC would select a certain core of economic scenarios and the actuary would calculate the projections using those. The actuary would add additional scenarios as requested or as he or she felt appropriate. That generated considerable controversy. There were people expressing opinions on all sides of that issue. Many people took exception to the "good and sufficient" language change to which I alluded earlier. Several said we did deal sufficiently with the C-3 risk, but we did not deal adequately with the C-1 and C-2 risks. Those points are well taken, and we are taking certain steps to correct that situation.

Another thing that generated a lot of controversy was Interpretation 7-D which outlined investment considerations and investment philosophy. In subsequent deliberations, our Committee has decided to remove Interpretation 7-D in deference to those comments that we received.

Another item was asset allocation. How and under what circumstances is the allocation of assets to line of business required? There were people who spoke on both sides of the fence on that issue. It would appear that our Committee is leaning towards an allocation of assets merely between surplus and other lines of business, or non-surplus items, as the only requirement. That is not to say that many companies should not or would not want to allocate assets on their own beyond those two categories. We felt that with an aggregate test, which is what we were considering, only the allocation between surplus and non-surplus would be relevant.

There were also a number of comments regarding the apparent infringement of this discussion draft on what I will call management areas. Many people viewed an allocation of surplus or requirement surplus as an infringement on management -- something that should not be dealt with in this manner. The discussion draft also indicates that if an economic scenario is a reasonable one and there is a failure under that scenario, then reserves should be increased. That generated some additional controversy. We also realized that the definition of "reasonable and plausible" as given in that discussion draft needed some enhancement and some definitions.

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With all of that background and those responses, our Committee is essentially in a waiting posture. That wait is primarily related to C-1, C-2 and the combination of risks area. We realize that there were certain shortcomings in the discussion draft with regard to this coverage of C-1 and C-2 risks and the combination thereof with the C-3 risk, but we felt that technical literature and research were not moving along in sufficient time frame in order for us to incorporate that now. Our hope is that research on C-1 and C-2 will continue and enable us to make a redraft sometime late in 1986 or early 1987. At this point, I am not frankly sure of that timetable. Basically, the Academy wants to move along at the same speed everybody else is.

The other bodies that are involved are the Society of Actuaries on a technical standpoint, the Joint Committee on the Valuation Actuary, the NAIC and the ACLI, among others. Those bodies are actively involved in all phases of the valuation actuary concept. Because some of these areas are so new, our Committee has requested legal input from counsel at the Academy. This might help us answer questions like:

- o How have we expanded the actuary's liability?
- o Have we placed too much emphasis on this opinion that perhaps might smack of being more absolute than is intended?
- o Are there any anti-trust considerations that we need to address since the qualifications and all phases of the calculation would be centered around the actuary?
- o Do we need to address other issues? Perhaps other people can be responsible or assist in the calculations.
- o Can we get some input on the proposed wording, and, in particular, the reliances that are expressed.
- o Finally, can we define some words? For example, "reasonable and plausible," are used throughout the literature. There is not a great deal of

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literature to date which deals effectively with defining those terms. At best, they are ill defined; we need some guidance here.

The last item that I would like to talk about is NAIC Guideline 14, which was acted on by an NAIC Committee in December, 1985. If it is ratified, and we believe that it probably will be, there could be some additional calculations required on a selective basis by the financial examiners. I believe that the guideline will go into the Examiner's Handbook, and under certain circumstances, currently unclear to us, the examiner could require extensive cash flow analysis along the lines that the discussion draft and much of the literature to date indicates. That would be first adopted for the 1986 convention statement. So, for examinations that take place after that, on a selective basis the examiners could require cash flow matching opinions.

In addition, an Actuarial Report to Management would be required. This would outline the actuary's assumptions and findings with regard to those cash flow tests. There are a number of people who have expressed the opinion that examiners currently have the ability to ask for that under current guidelines. I am not aware of any cases in which that, in fact, has happened, but people have indicated that there is a possibility. From our perspective, the valuation actuary concept is moving along, albeit at perhaps a slower speed than it was a few years ago.

MR. PAUL O. KIRLEY (Discussion Note: The Valuation Actuary and the C-3 Risk -- An Attempt to Describe the Problem): It has been more or less accepted that the way to quantify the C-3 risk is by projecting cash flow. Cash flow is a complicated function of the company's situation and of the economy's situation. For the purpose of this discussion, it will be assumed that the interest rate yield curve is an appropriate measure of the economy's situation and also that the company's set of assets and liabilities, together with its intentions towards its assets and liabilities, is an appropriate measure of the company's situation. To the extent that other measures are felt to be necessary, what follows should be accordingly modified.

Let the following symbols be defined:

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- A_0, L_0 denote the sets of assets and liabilities on the valuation date. Thus A_0 includes the bonds and stock certificates in the vault, etc., and L_0 includes the master file of insurance and annuities in force, both as of the valuation date.
- S^A, S^L Denote the strategies for investment and operations which are known as of the valuation date. Thus S^A and S^L include all strategies for investment and marketing which have been developed, not only those in use on the valuation date, but exclude any strategies which might be developed in the future. Thus, if a company intends to buy only 5-year bonds unless the yield curve inverts, in which case it will buy only 90-day bills, S^A consists of these two strategies and ought also to include some liquidation rules.
- h denotes the horizon of time over which cash flow is to be investigated; the period from the valuation date to the horizon is noted $[0, h]$.
- I denotes the space of all possible yield curves. A point $i \in I$ is thus a yield curve, that is, a function of maturity duration d . $i(d)$ is an interest rate.
- $P(I)$ denotes the space of all paths ("scenarios") of length h , starting on the valuation date, in yield curve space I . $p \in P(I)$ is a path, that is a function $p: [0, h] \rightarrow I$, where 0 is the valuation date. Thus, for $0 \leq t \leq h$, $p(t)$ is a yield curve, so that for a duration d to maturity starting from time t , $p(t)(d)$ is an interest rate. $P(I)$ represents every possible path the economy might take in the h years following the valuation date; $P(I)$ is obviously large and too complicated to analyze without very powerful tools. But there are no powerful tools available at the moment; so it is proposed to test only a small part of $P(I)$.
- T is the subset of $P(I)$ which is to be tested. It is not clear yet who is to specify the particular subset $T = [p_1, p_2, \dots, p_m] \subset P(I)$

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of "scenarios" to be tested, nor is it clear how large the number of elements m in T should be.

F denotes cash flow. At any time t years after the valuation date, F is a function of A_0 , L_0 , S^A , S^L and the portion of the scenario p under test which has unfolded to date (denoted $p|_{[0,t]}$). F is a good deal more difficult than other variables to define specifically, however. In view of the strategy S^A , for example, one cannot merely net out investment rollover, since a 5-year bond could have rolled into a 90-day note if p had passed through an inverted yield curve. Clearly a working definition of F which allows its computation, given the 5 variables it depends on, is essential.

Presuming that cash flow F can be calculated along each scenario $p \in T$, the set of scenarios to be tested, it then becomes necessary to decide exactly what all the calculated numbers mean. That is, what constitutes a potential or actual solvency problem along a scenario $p \in T$? The possibilities are to:

1. Test for statutory solvency for each $t \leq h$ for each $p \in T$.
2. Test for GAAP solvency for each $t \leq h$ for each $p \in T$.
3. Test for "excessive" negative cash flow. But what does "excessive" mean?
4. Upon completion of the cash flow calculations, use S^A to determine $A(t, p, A_0, F)$, the assets for each time $t \leq h$ for each scenario $p \in T$ which result from the assets A_0 on the valuation date and the cash flow F . Here $A(t, p, A_0, F)$ is a set of assets (e.g., a pile of bonds). Test to see if either (i) A becomes exhausted ($A=\emptyset$) at any time under any scenario or (ii) A becomes completely illiquid at any time under any scenario. Something clearly also needs to be done to test the assets at the horizon h where the projection stops; perhaps one of the solvency tests at the horizon would be adequate.
5. Other.

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If a solvency problem is detected along some scenario $p_j \in T$, it becomes necessary to evaluate this problem for its severity. It seems intuitively clear that there is some scenario, possibly extreme, under which virtually any company (with a reasonable ratio of statutory assets to statutory liabilities) will encounter solvency problems. Thus, there would seem to be a second problem associated with the choice of T : that of assigning a measure of the risk $r(p_j)$ that a given scenario $p_j \in T$ will actually unfold. Ideally, of course, one would like to be able to examine all of $P(I)$ for solvency problems and also to be able to assign a measure of risk to each scenario in $P(I)$, so that these two measurements could be made for each scenario in $P(I)$, multiplied together, and summed to give a global picture of the probability of the company's cash-flow insolvency over the h years starting on the valuation date. This could be accomplished by assigning a probability measure to $P(I)$ and integrating; but one is still left with the problem of analyzing all of $P(I)$ for insolvencies. Alternatively, such a probability measure could be assigned to T .

Among the many problems and gaps in the above are:

1. Giving a computable definition of cash flow F in terms of the economy $p(t)$ and the company's situation at time t , presuming the latter to be known.
2. Using the results of (1) to project F and A out in time along the scenario p .
3. Interpreting the results of (2) for a particular scenario.
4. Deciding what scenarios to test and how heavily to weight the results under a particular scenario so chosen.

The problem is at least as difficult as described. There is yet little evidence that the actuarial profession is ready to solve it without a lot of simplifying assumptions or guesses.

MR. ARTHUR C. CRAGOE: For a good one page status report on the subject, I refer you to the March, 1986 issue of the *The Actuarial Update* and the article by Allan Affleck. In many such reports I hear the phrase

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"valuation actuary issues." After two years of papers and meetings reports, I am not sure that I know what all of the "issues" are, and especially what I would do to resolve those issues in my own mind if I had to sign a report as valuation actuary today.

I am assuming that an "issue" is an idea or proposition where there are at least two points of view or two approaches. I can understand this term "issues" as it applies to calculation techniques and assumption choices, but I am not sure what other things are "issues" in the valuation world. What are we really signing on for here?

Hopefully the word "actuary" will be well defined by standards promulgated by the Academy and by the educational requirements articulated by the Society. The word "valuation" will apparently be used to discriminate between all other actuaries and those who will be asked to sign the statutory statement opinion as to reserve liabilities. There is, of course, now a requirement that there be such a statement, but no title of valuation actuary is yet required. However, the anticipated duties will be expanded, as we have heard, and the term "valuation actuary" should be defined by the NAIC and perhaps even by certain state laws.

But this leads to an issue, the management of the valuation actuary -- who will appoint him or her; who will pay him; who will he be responsible to? Should the valuation actuary be an arm of the state, paid for by the company but as independent as a CPA? Now comes opinion time. I am not sure that there are answers yet, but I will say what I think.

I feel that most companies and probably most actuaries would be uncomfortable with the idea of the valuation actuary being an arm of the state. However, how else, except with lots of state influence, can an actuary-employee have great influence in his company if, in fact, his views are based on his subjective and personal views of the future economic environment and such subjective economic views differ from those of his management or possibly from those of the pricing actuaries of his own company? For the time being, I feel that most companies will want the valuation actuary to be an employee, like any other employee, but

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with duties that will encompass additional special requirements mandated by state regulators.

Perhaps there is an issue on how the current state reserve laws should be modified to accommodate the opinion of the valuation actuary. In other words, is a company insolvent when the valuation actuary says it is? Or, is there going to be a state law that says a company is insolvent and guarantee funds are triggered, when something occurs beyond the opinion of an actuary-employee making a statement?

My answer, for now and until more sophisticated approaches are tested by experience, is to go as far as we can with the somewhat misnamed "two-tier" approach. This means there would remain a well-defined legal (and tax) minimum standard for computational techniques and assumptions. However, for those who demonstrate to the satisfaction of state regulating officials, an alternative standard would be available that could produce a lower reserve liability for statutory (but not tax) purposes. I say misnamed, since the lower standard of reserves is not "built upon" to produce the higher standard. It is an entirely different type of calculation.

A hidden issue here would be what the reserve is for legal insolvency standards. It seems to me that it would have to be the one produced by the tier that does not depend on an actuary's opinion. There may be many who would disagree and believe that the opinion of an actuary who is qualified to sign his statutory statement should also be sufficient to decide the legal solvency of his company. At this stage of our professional knowledge and standards, I feel this is a bit presumptuous. There are about 2,000 life companies in the United States, and I am not sure there are enough actuaries whom we, or the regulators, should trust to independently decide as critical an item as legal insolvency -- even if our lawyers and the state would say we could. It would be very nice if an actuary in Company A could prevent a guarantee fund assessment to Company B by a personal opinion relating to Company A and based on a subjective economic scenario. However, at this state of our development, I doubt we, as professionals, should support this idea.

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Of course, any company could, if its regulators approve, hold higher reserves as voluntary reserves just as it can now. The additional computations made by a valuation actuary should help in the justification of these reserves.

When I say an economic scenario, I believe that the valuation actuary's work must be based on the things that he knows about, that we are expert in, such as mortality tables and computational techniques. Most published valuation actuary work deals with cash flow projections, which are based on a subjective economic scenario. I submit no one is an expert in that. We can only operate as an expert in a partial capacity. Ed is recognizing that. The opinion will say it in fancier words, but I think we always have to remember that we are really not as precise in these calculations as we have been in most of the subjects in which we were being prepared for through the Society training. The issue of how to reflect the level and incidence of cash values in reserve standards is still with us -- even with a valuation actuary opinion -- as it has been ever since reserve standards were divorced from cash value standards. This issue should not sidetrack us from pursuing the balance of the valuation actuary objectives such as developing as sound a reserve standard as our computational abilities and ability to forecast the future will permit. Such forecasts are now going to be both in terms of mortality and morbidity statistics with which we should have special knowledge, and in terms of certain economic forecasts for which no one is a reliable expert.

This leads to another issue. The joint Academy and Society committee report on the "role of the valuation actuary in the United States" suggested a requirement of a report involving "internally designated surplus" which might be needed with reserves and future cash flows to cover future plausible fluctuations. I believe that there is a strong feeling that any attempt to influence surplus levels would be an invasion of management's prerogatives.

Some states may feel the necessity to limit mutual company surplus in order to force reasonable dividend distribution. Also there may be a reasonable minimum capital and surplus ratio (using minimum non-opinion reserves to determine the surplus) which, if not met, would allow state regulators to take increasingly restrictive actions. In other words, we may have to allow our regulators, and even encourage them, to move a little more swiftly toward corrective action for

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budding insolvencies. Our purpose is to prevent insolvencies, and we have to allow them to move a little more quickly to influence company actions. To do that, however, I am sure we have to go beyond the opinion point of view and say, "Okay under certain circumstances, based on a non-opinion reserve standard and a capital surplus ratio that seems to be dwindling, you have the right to come in and take some action before technical insolvency occurs." This is a step that would tread on some toes; but I think we have to ask ourselves: What can an actuary do in a forecast based on a subjective economic scenario that involves contingencies that are not necessarily C-1 and C-2 risks?

One of the good actuaries monitoring these developments over the last few years likened the evolution of our valuation standards as reflecting stages on a journey. To this I say, "Yes, but let's not feel we are near the end of the journey." I am not sure we even know where we should be going. Also, it is not clear what it is that we do not yet know about the subject we are attempting to deal with.

The Discussion Note provided by Mr. Kirley, gives some details on the C-3 risk. The gist of it is that when we project both asset and liabilities into the future, their interrelationship adds a very complex dimension to the problem of forecasting the future. We have not yet really described the problem, much less defined or solved it related to cash flow for all business segments.

A key goal to the whole valuation actuary exercise, to me, is to anticipate potential insolvencies. It's not good enough to me to say that with sufficient education and training of the valuation actuary that an insolvency will occur when the valuation actuary says it does. Also, since controlled or uncontrolled action on assets can have as drastic an effect on the balance sheet as action on liabilities, the interrelationship is important. The point is we need many simplifying assumptions (with the uncertainties inherent in simplifying assumptions) to even describe the C-3 risk (and there is still room to work on C-1 and C-2 risks). Much work has been done with GICs and SPDAs, and there is a growing literature base for these important products, but as of now, I am not sure there are many new computational techniques that in and of themselves would significantly shed light on potential insolvencies for traditional life

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and term companies or even for the parts of universal life policies not related to "pour-ins."

The issue here is, are good and sufficient new computational techniques and assumption-choosing procedures in place so that a valuation actuary, after being exposed to them in a reasonable environment, can:

1. Describe to management or regulators, or both, the likelihood of loss from C-1, C-2, or C-3 risks for which the company has not yet set up reserves?
2. Assess the reliability of asset quality judgments made by others as part of the valuation process, such asset quality being a component of cash flow analysis?
3. Prepare cash flow analysis of estimated future events that aid in providing the justification of item 1?

It's an oversimplification, but I sometimes think of the two concepts of: (1) a standard formula reserve calculation, and (2) the scenario testing concept we are trying to describe and set up, as I used to think of the two statistical concepts of "mean" and "standard deviation." At this stage not only am I struggling to see the issues and describe the problem, I'm not sure of the proper confidence interval (determined by scenario) that it is reasonable and proper to put about the mean (legal standard text book reserves) to help management in its deliberations as to the use and distribution of surplus or to prevent potential insolvencies.

I am looking forward to the next step of the journey -- more computational techniques for products other than GIC and SPDA, based on research and accompanied by lists of assumptions, both actuarial and economic. These plus the simplifying techniques with tests of their possible oversimplification will be most useful to clarify what we are trying to do and expose the limitations of our ability to do it. In the meantime, I hope we will keep a questioning attitude towards the "whats" and "whys" of the things we are going to be asked to do in the name of implementing the valuation actuary concept. I hope there is no "issue" on the idea that we should support sound reserving standards and

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the use of the most up-to-date and proven computational techniques and methods. In the Society of Actuaries, we have to find out what these tools are and how good they are.

MR. CARROLL: There are three other things that are in the mill:

First in Canada, a special committee of the Canadian Institute of Actuaries (CIA) was charged with considering whether the CIA should seek a broadened roll for the valuation actuary, and, if so, what it should be. The committee came out with its final report in November, 1985. This is just a report for discussion purposes, but it has at least three major recommendations for broadening the role of the valuation actuary in Canada.

It recommends that the actuary's opinion should encompass the ability of the company to meet its future obligations with respect to both existing and anticipated future new business. It recommends that the job of the valuation actuary should be redefined to be continuous and ongoing, not merely a December 31 snapshot of how the company is doing, but an office that would continuously monitor the financial position of the company. In addition to reports as of December 31, reports would also be required whenever the valuation actuary judged that circumstances required a new report. It recommends that the valuation actuary's report be to the board of directors of the company. These ideas are being discussed, and have met with some resistance.

Second, in 1985, the New York legislature passed a law which practically forces companies in the annuity and GIC business to do the special opinion and supporting memorandum that have been required in New York since 1982. In 1982 when New York enacted its version of the NAIC standard valuation law, it required, as a condition for using the higher valuation interest rates that are associated with annuities and GIC contracts, that a company provide a special actuarial opinion and memorandum explaining how the opinion was reached. The essence of the opinion was that the reserves together with the supporting assets made "good and sufficient" provision. Circular Letter 33 in New York gave guidance as to how the actuary should take into account future cash flow projections in reaching that opinion.

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The change in 1985 practically mandates the opinion. In the past, it could be avoided by using the lower interest rates. The essence of the change is that those companies that don't file an opinion, which, in form and substance is satisfactory to the superintendent, will be subject to a higher minimum reserve standard. There are two task forces in New York, one working on guidance with regard to the opinion and one working on the reserve standards for companies which do and which don't provide a satisfactory opinion. These two different standards are referred to in New York as the two tiers, a low standard for the companies that file a satisfactory opinion and a higher one for those which don't. The regulations are expected this year. There will be an opportunity to comment at a public hearing.

It is likely that the New York work will focus only on reserves and will not discuss the adequacy of surplus or the adequacy of assets in addition to those supporting reserves to withstand more severe fluctuations. The memorandum in New York may be a public record. That raises confidentiality questions, which are being addressed. New York goes further in the discussion of the quality of assets and the guidance that it gives to the actuary than, so far, the Academy seems to be willing to go. The "good and sufficient" language has been maintained rather than switching to language like "appropriate," because the New York law itself uses the language "good and sufficient." New York may specify some scenarios that must be tested, rather than leaving it to the practicing actuary. In general, you will find greater detail in the New York regulations than in the Academy Standards of practice.

Finally, earlier this week at the NAIC Meeting in Boston, John Montgomery, Chairman of the NAIC Actuarial Task Force, has asked that his task force be given a new assignment. The assignment is to commence study toward reconstitution of the standard valuation law including, among other things, (a) incorporating the concept of the valuation actuary (b) considering solvency determination and (c) coordinating life, health, annuity, credit and miscellaneous lines of business. This would be a major revision of the standard valuation law. It would establish the legal framework for the valuation actuary. If the valuation actuary concept is to become a reality, changes in state law will be needed. This is a step toward building a model.

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Note that it would coordinate all lines of business. The standard valuation law in the United States currently covers only life insurance and annuities. In some states another law covers health insurance. By incorporating health insurance, the charge incorporates an issue with which the Academy, the NAIC and the Health Insurance Section of the Society of Actuaries are now wrestling. Some of you may know that the NAIC has exposed a proposed valuation law for health insurance, and that there is a good deal of severe criticism concerning it. The actuarial profession is a long, long way from a consensus on what the standards should be.

A second part of the charge is that the conceptual and drafting support is to be provided by the Standing Technical Advisory Committee (STAC) and such groups as it requests for assistance. The STAC is an NAIC advisory committee, chaired by Charles Greeley and composed of actuaries, which has advised the NAIC on valuation and other matters since 1980. Its surplus and solvency sub-committee, chaired by Walt Rugland, has been responsible for much of the activity in the valuation area. It was responsible for the report back in 1980 when the NAIC adopted its amendments and suggested that there was more to valuation than merely following a formula. It urged the Society to reactivate its Valuation Committee under Don Cody. It was responsible for the formation of the C-3 Risk Task Force. I believe its members agitated for formation of the Joint Committee. Now, the NAIC Actuarial Task Force is being charged to draft a law, and it is being asked to go back to this committee for advice. The project has come full circle.

MR. JAMES W. PILGRIM: I am very concerned about what we say is the responsibility of the valuation actuary and what we really can do when we have an insolvency on our hands. Human beings being what we are, are going to try and find any way to get money from anywhere and have anybody served up as a scapegoat. In that regard, I would like to have you, Bill, give me a little more discussion on the distinction you make between the adequacy of reserves together with assets and income, because Art made the comment that our primary purpose is to prevent insolvencies. When I hear that, it seems to me that this valuation actuary role really is talking about the adequacy of surplus for all future obligations of the company. The other comment I have is more of a question and that is the role, alluded to by Art, between the pricing actuary

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and the valuation actuary. I think that's critical within a company. I draw the analogy to our property and casualty brethren. Throughout the year the production underwriters are producing business, and one day a year, they hand it to the casualty actuary and they say, "Okay, it's all yours. You determine what the IBNR ought to be." In the meantime, the actuary has not had much to do in the way of controlling the business as it comes through the door.

MR. CRAGOE: Well, I am reminded of a little thing I read just the other day from the CIA. It's special committee on the role of the valuation actuary has been in existence a long time. The CIA has had a closer relationship with the U.K. where the valuation actuary concepts have been in force for an even longer time. The CIA takes the best parts of what they hear from the U.S. and from the U.K.

The CIA is still discussing its role in this concept of bringing in new business. It is sort of a trial balloon. I have heard from a couple of CIA members that this might be challenged. I'm digressing a little, but I wanted to get in a comment about that new business thing. I hope that we nip that in the bud. I have seen a great number of companies offered for sale where there are rosy projections for new business by the consulting actuary selling the company, who also might actually serve as valuation actuary for this company. His consulting firm may have a different view on what the future might be on new business. I think that we have to be very careful about new business.

CIA members were talking about the concern that some of their membership were feeling as they approached the actual moment of signing. They said we can even speculate in the short run that some actuaries will feel that they should withdraw from the position of valuation actuary. Some chief actuaries may feel the need to resume these responsibilities. The thought of this Canadian group is that the valuation actuary is really a senior actuary deal. The whistle blowing has to be at the top level. It will include jawboning the Board to do the right thing. To put the responsibility on a junior technical actuary is the wrong way for them to go. The concern was that maybe only a senior actuary with long experience should sign. Obviously, he didn't do a lot of the work so he has to take a little bit of the work on faith. But the CIA is trying to get responsibility at a high level.

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MR. SILINS: I have a comment on whether we are looking at surplus or looking at reserves to prevent insolvencies. I think it's both, and the work the Academy has been looking at primarily is dealing with reserves. The actuarial opinions state that allocated assets are equal to the reserves, and then one makes the test to see if there is going to be enough money to pay the bills. The assets, not the reserves, will pay the bills. We are really testing assets equal to the reserves and then subsequently we are going to look at surplus. We will look at some of the literature, perhaps look at surplus as two pieces, contingency surplus and then vitality surplus. So it is really both reserves and surplus.

MR. RICHARD M. WENNER: I like your idea of a unifying theory, but I don't think we are there yet. Looking at how we reserve now, as I see it, we use as a basis "most-likely" assumptions with a margin for conservatism and then make a statement that the reserves are good and sufficient. So, in concept, we look at a *single* scenario, albeit we may have tested to make sure that it is an adverse scenario, and then we make an absolute statement. It is almost beyond my comprehension why we, as actuaries who deal with future uncertainties, fail to employ directly the concept of probability of adequacy.

For me, the probability-of-adequacy concept and the following approach to reserve setting come close to being the needed unifying concept, the "universal general" as opposed to the "earthly particular" represented by the single-scenario reserve and absolute opinion statement. It seems to me we are headed towards this result, but we are not establishing it as the end goal. We are overly focused on what we can technically do currently. The conceptual approach to reserving that I advocate consists of: (i) envisioning all possible scenarios (either through projections or through statistical means -- there may be other ways of doing it), (ii) determining the relative likelihood of each and the reserve needed for each, and then (iii) assessing what the probability of adequacy is of the particular number (however computationally derived) that we propose to hold as the reserve. When we do that, we then can say in our opinion what we really mean to say -- namely, that the reserves are adequate at an appropriate level of probability. Practical application of this universal general requires all sorts of approximations and shortcuts (and actually results in another earthly particular). There are just as many assumptions and

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judgments involved in this approach as in what we are doing now, but it seems to me, it sets the ultimate target where it ought to be.

Some would argue we are never going to agree on what the appropriate adequacy-probability of reserve is. I would say that if we, the actuarial profession, can't give ourselves some sense, in some way, of whether it is closer to 51%, 75%, 90%, 95% or 99%, then all attempts to define the words "reasonable" and "plausible" referred to earlier are equally fruitless.

Now as to the role of the actuary in evaluating surplus, it seems to me that if I know that the probability of adequacy of reserves that I am expected to attest to is around 51%, then if I don't start looking at surplus, I am not sure that my opinion on reserves says much. On the other hand, if the adequacy probability standard is extremely high, then I would say the actuary does not have to pay as much attention to surplus. (Whether anything at all is said about surplus in the opinion itself, is another issue.)

Projecting asset/liability cash flows in various interest rate scenarios seems to some to be the ultimate in reserve testing. To me, that's still an earthly particular as opposed to a universal general. There are so many other variables that are taking place which can affect the reserves. Yes, we don't have the computational means now to take into account all factors, but that should be our ideal.

Because we insist on using absolutes in our opinion, we look for hedges. One such hedge mentioned involved a caveat with respect to future events. I have forgotten the exact words, but they struck me as strange since all reserves represent the earmarking of funds for future obligations, many of which are contingent on future events. Rather than look for "safe harbors" to use in our opinions, I would advocate saying what we really mean in the first place, which implies talking about the probability of adequacy of the reserves.

MR. LARRY M. GORSKI: Art made some comments concerning changes in the Canadian system. I believe they involve the concept of continuous follow-up or monitoring. That idea has intrigued me for a long time. One of the things we try to do in Illinois is to monitor companies throughout the year on selected

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variables -- adequacy of A & H claim reserves, interest spreads things like that. I was wondering if we could get some comments on requiring that as a form of periodic reporting, let's say on a quarterly basis. I am not speaking of a quarterly statement, but simply of review by the actuary who has signed the annual statement of certain critical variables that a company is dependent on; for instance, Schedule H type analysis throughout the year, interest spread, growth and income, things like that.

MR. CARROLL: May I ask you a question? Isn't this your job that we are talking about? Don't we already have commissioners that are responsible for regulating insurance companies and for appraising their financial condition?

MR. GORSKI: I agree, it is our job. We do this on a selective basis. I was looking for comments as to whether this would be something that seems reasonable to the actuarial profession as a whole. It is something that we do for maybe 35, 40 companies half domestic, half foreign. I am looking for some input as to whether it is something that should be pursued across the board.

MR. SILINS: We had one interesting comment on the Academy's draft on that issue. One person wrote in and said, by the time he develops his computer model; comes up with his assumptions including the economics scenarios; does the calculations; put them in reports; and discusses the report with management, it is probably a year and a half past the time for which he is making the opinion. While that perhaps overstates the case, it brings up an interesting point in the time frame. I don't want to put words into this gentleman's mouth, but I would say that to perform this calculation on a quarterly basis, perhaps might be too onerous to the company.

MR. GORSKI: I think maybe my comments were misunderstood. I wasn't asking for a C-3 type analysis on a quarterly basis. I was simply asking for analysis of the actual experience of the company throughout the year. For instance, as of June 30 of this year, was there a representative spread between what you are earning on your investments and what you are crediting on your interest sensitive products? Look back at your December 31 A & H reserves. Are they adequate with the runout through June 30 plus additional liabilities for the reserves? That is what I am referring to, not going through a mass of

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scenario analysis. What you said seemed to be reasonable at year end and how is that panning out through today?

MR. CRAGOE: What the Canadians said was a little off that subject. They were, I think, borrowing from their British cousins. In the U.K. the appointed actuary has a duty to report when anything serious occurs that he feels would jeopardize the future of his company. I think that they are trying to borrow the U.K. philosophy and not necessarily require more periodic reports from every company. Perhaps, from your point of view, for the monitored companies you would want to do that. From a general viewpoint, it would seem that the valuation actuary, for example, should be involved in the pricing of new products, or at least monitoring the pricing. If he sees something that looks like it is going to give trouble, he does not wait until the next valuation opportunity but makes his report right away. That seems a little extreme, but you can remember that in some reinsurance transactions, things can happen very suddenly or perhaps in the property and casualty world, they can happen a little more suddenly than for most of our traditional life products. I believe this is what they were after, and the ongoing requirement is for when they really need to report something serious.

MR. JOSEPH L. TUPPER III: There is something that bothers me a little bit about concern over the probability of adequacy when we are looking at something like projected cash flows. Each piece of the cash flow has in some sense an expected probability. We are looking now at twenty years, five years, one year, whatever. In a model that has little contagion we would expect that, when we lump all these things together, our variance decreases. If we look at many scenarios, we get something that feels like an expected probability, and we get some feeling for what a confidence interval might be. The problem is that, when you are looking at an economic scenario, the basic underpinning of that scenario is that you have significant contagion. If you have that, then you don't necessarily get a decrease in the variance. You could very well get an increase, and as the time line on your forecast lengthens, the horizon goes further out, it is possible that that variance could grow to be essentially unbounded. In which case, what are we talking about? So, the point of this is that we don't know yet whether we have a theoretically boundable variance.

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MR. CRAGOE: How many times can you go insolvent? If our reserve is like a mean, and the scenarios are like the variance points around what might happen in the future, how bad that variance can really be would depend on how bad your scenarios were, and really is that going to work out?

MR. TUPPER: It may be a little more complicated than that. The problem is that the future of the company is a sum of a lot of little events. The variance on each of those events depends to some extent on the scenario that you choose, or the set of scenarios that you choose. There is reason to presume that if you pick a scenario, you are going to be picking one that has certain kinds of biases built in. It may not really be reflective of the kinds of things you need to test in a solvency test. We tend to pick reasonable kinds of things. Fifteen years ago, we would not have picked what happened in 1981 as a reasonable economic forecast.

MR. RICHARD S. ROBERTSON: Let me call attention to the recent exposure draft issued by the Society's Committee on Valuation Principles which was mailed to all members of the Society a few weeks ago. The exposure period runs until July 1. I want to encourage everybody who has an interest in this subject to read it, think about it, form an opinion and write. There is a lot in that report that I think is quite good. There are also a few things in there that I think are horrid. I am in the camp with Art. I do not believe that we should be defining surplus levels for companies, and even if one believes that that should take place, it certainly is not an actuarial principle. But that's fine, if you agree with that point of view, be sure to write; and if you disagree with it, you should write. We need to get the issues appropriately aired, and this is the best place to do it.

MR. CARROLL: Art, as you know, is a senior actuary in his company. He is example of a person who is both a professional and also a member of the top management of the company. We have in our country many actuaries in that position. If we are going to be asking these actuaries to get involved in making this kind of a public statement, are we putting them at a distance from the rest of their management? You understand what I am getting at, Art? Can you do both jobs? Is the rest of the management team going to want to stand off from you if you become the whistle blower?

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MR. CRAGOE: That's a serious problem and particularly since, the younger actuaries in my company say, "I don't want to be valuation actuary." They are really lining up in a hurry not to be that because they don't want to take the responsibility for the future. Yet, we are a very surplus rich company. We are as solid as we can be. We don't have GICs and things like that. So we don't have to worry. But, nobody wants to go on the risk for twenty years down the line saying, "I guarantee the solvency of my company," because what are you guaranteeing? You are guaranteeing management decisions. I agree, I am one of the management. But, I can get outvoted pretty easily. So, it is not going to be an easy decision. It won't distance me any more, and I don't think it will distance any of us any more than we are now from the point of view of the person who has to be worried about the reserves. In theory, we all have that responsibility right now. I am not sure that the valuation actuary has actually done more than sort of put us a little more into guessing the future. We have been talking about those reserves for a long time. We have been responsible for them. This is more of the same. Hopefully we can keep away from asking for too much from the valuation actuary concept such as assuming we are going to cover all the flaws in the future that could ever happen. Surplus is set aside for a reasonable amount of adverse experience. You had better not touch it for something else. If we can keep on this track, I think we can live with the valuation actuary concept.

MR. SILINS: I would like to ask for your comments. I have called this the theory of everything for insurance companies. It encompasses so many things that are really beyond the purview of the actuary. It incorporates future dividends, it incorporates the ability to manage expenses, it incorporates investment philosophy and the company's ability to ratchet its investment philosophy up or down depending on the scenarios. The list goes on and on, and so many of those responsibilities are generally outside the purview of the actuary alone. In some cases, the actuaries would be responsible. A lot of people have expressed the opinion, and I would concur, that management in general needs to be responsible for a lot of these things. One of the things we tried to do was place reliance by the actuary on certain members of management. There was mixed reaction. But, there is a school of thought that thinks that management in general should be responsible for all these things, not just one of us.

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MR. CRAGOE: The thing that I keep coming back to is the question, what is insolvency? What are we worrying about these things for? We are going to worry about these things when we become insolvent. What is insolvency? If insolvency is what an actuary says it is, then I am not going to worry so much.

I have a lot of friends who tell me that I am not insolvent. But if insolvency is going to continue to have a legal basis, then I think that is where we should be. I am not so sure that we should abandon this.

MR. CARROLL: Ed, regarding your involvement in the draft opinion, you mentioned that you have been trying to find some words that would convey the idea that the opinion is not a forecast of the future. I have my own little analogy that I use when talking about that, and it deals with chess. People who are masters at chess, as some of us are masters at the job of the valuation actuary, are able to look at a game in progress and make a judgment. But the nature of the judgment is usually expressed in words like this: "White has a won game"; not, "White will win." Or, "White is winning"; or, "The position is unclear." These are all statements about how the game now stands. They are not statements about how it is going to come out. I think that the challenge to the Academy drafting group is to try to find a way to write the opinion so that it is a statement about how the company stands as of the statement date, a statement recognizing that how the company stands is in part measured by somehow accessing its ability to meet its future obligations.

MR. SILINS: One way we addressed that was to state in the opinion that these calculations in this opinion are done annually. That implies that there is a time horizon over which the value of these calculations diminishes very quickly. We thought that one year was probably the maximum time horizon for which this opinion was of value; perhaps less than that depending upon what happens in the company.

Second, as I read from the Opinion earlier, we wanted to include that these are projections and lots of things can happen between now and twenty years from now that would cause these projections to be less than totally accurate. If that happens, it's not my fault; things happen. Most of us can't predict what is going to happen next week let alone what the dividend philosophy will be, or

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what the general expenses will be, or what new management might do in any number of areas. So we did try to roll that in and put caveats on them, and I guess that is a different approach than Dick Wenner mentioned before about just coming up front and saying, "I've looked at things and the probability of this company being solvent is X percent." Perhaps the two do the same thing. One gives you more of an absolute at the top and takes it away in the caveats and limitations. The other approach Dick mentioned goes directly at it and says the probability of insolvency is X%.

MR. CRAGOE: We are in a Society of Actuaries meeting. We have not talked too much about the role of the Society. One of the things I noticed in Canada is that the Canadians are working on what they call technique papers. The question that I came away with is do we really want some technique papers? We have gone to a lot of symposiums that talk about how other companies do things. We have not had any recommended standards of practice yet involving detailed methods.

MR. SILINS: That's true. There have been some papers.

MR. CRAGOE: But they are not recognized as standards of practice at this point.

MR. SILINS: No, they are not.

MR. CRAGOE: The question is, "Do we want something?"

As a profession, how are we going to get this work done? Does everybody want to go off on his own? The Academy has given us a nice statement. Now all we have to do is sign it and do some work, but I am not quite sure I know how to do the work yet.

MR. CARROLL: Having sat in on most of the meetings of the Society C-3 Risk Task Force, I can testify that they were very careful in presenting their findings to present them as illustrations of techniques that might be used, as opposed to examples of what you ought to do.

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MR. CRAGOE: Have the examples gone beyond what I call the single premium products?

MR. CARROLL: I think their array of examples covers deferred annuities, universal life, even par and nonpar whole life. Quite a number of different kinds of products were discussed, and this material is in the *Record*. Don Cody's bibliography is an excellent reference to some of the scientific actuarial work that has been done in the last five years or so. One source of it is the pamphlet that was distributed at the Product Development Seminar held the day before the Boston meeting in 1986. We have deliberately avoided discussing the Society aspect of this. We have been focusing on some of the issues that have arisen as standards of practice have evolved; and we have not discussed the work or lack of work by the C-1, C-2, C-3 Risk Task Force, or by the Combined Risk Task Force.

MR. SILINS: As I mentioned earlier, the Academy has slowed down a little bit because we did not want to get too far ahead of the theory. You can't really have standards without practical theory, and that was one of the reasons I indicated that we wanted to move ahead at the same speed that everybody else was. You can't get too far ahead of the pack without the tools to do it.

MR. CARROLL: In my opening remarks, I mentioned that there are three foundations on which the valuation actuary concept is being built. One is the standards of practice which the Academy is working on. One is the basic knowledge of the actuary which individual persons as members of the Society and also committees of the Society have been developing. The third is the legal framework of the whole thing. What Ed is saying is that they have to go together. No one can get too far ahead of the others. We certainly would not want to have laws until we had the standards in place and knew what they meant. Ed is telling us that he does not want to publish standards until we have the theory.