

SESSION 7

A REPORT ON THE STATUS OF THE
SOLVENCY COMMITTEE REPORT
(CANADIAN SESSION)

MR. DAVID R. JOHNSTON: At this session we're going to give an update on the thinking of the CIA's Committee on Solvency Standards. The committee was established last year with a mandate to study solvency testing for financial institutions and to develop standards for actuaries doing this work. At this time we are looking only at insurance companies, even though our mandate is broader. All three of us are members of the CIA Committee on Solvency Standards.

My task is to set the stage for the two speakers who follow me. I want to talk about why there is a need for solvency standards in Canada and, in general terms, how we see the work of our committee proceeding. Trevor Howes will outline basic concepts and principles of solvency reporting as currently being developed by our committee. Bill Black will finish up, describing an initial approach to solvency reporting that we feel may be practical in the short run and that relates to the Canadian Life and Health Insurance Association (CLHIA) formula that Wayne Bergquist described earlier.

The opinions we express and the directions we are considering are neither carved in stone nor as yet approved as official policy by the Canadian Institute of Actuaries. Rather, they indicate our committee's thinking at this time. We hope to get feedback to help us.

As several speakers have pointed out, the valuation actuary concept has existed in Canada since 1978. Since there were no guidelines or statutory regulations existing to help the valuation actuary, the CIA developed the first set of Recommendations, or standards, in 1978 to provide that guidance. These CIA Recommendations have proved invaluable, but nonetheless they have had a number of serious deficiencies.

The primary problem was that in many areas, the guidance given was too general. In particular, the appropriate degree of conservatism in the valuation assumptions was not closely defined. Other matters are only being dealt with now through the device of technique papers.

Over the same period, price competition has sharpened, both with the life insurance industry and against trust companies and banks in connection with common products. As a result, there has been pressure on the valuation actuary to reduce margins. These pressures, combined with the problems I mentioned in the financial reporting recommendations, have led to a general tendency for valuation margins to dwindle over the period since 1978.

Outside the insurance industry there has been even more cause for concern. Speakers yesterday pointed out that several smaller banks and trust companies in Canada have become insolvent. These failures weighed heavily on the minds of both members of Parliament and senators last year when they studied the ramifications of the government's proposals for reform in the financial services industry. Committees from these two groups made recommendations suggesting greater responsibility for actuaries in reporting on the solvency condition of financial institutions. Session 3's speaker, Paul McCrossan, was an influential member of one of those committees.

Partly as a result of these developments, the superintendent of insurance has felt the need for legislated solvency requirements. Draft legislation developed last spring gave the superintendent the authority to prescribe minimum capital and surplus requirements by way of regulations. I think we're fortunate that he has indicated clearly a desire to work with the actuarial profession and the industry association in developing such requirements.

It might be noted here that one of the key recommendations of the CIA's Special Committee on the Role of the Valuation Actuary in Canada concerned the actuary's role in assessing solvency. This committee recommended that the valuation actuary's formal opinion encompass the ability of the company to meet its future obligations with respect to both existing business and anticipated future new business.

I believe this recommendation covers two new directions for the valuation actuary in Canada. First of all, in giving an opinion of the company's ability to meet future obligations, the actuary will effectively be commenting on surplus, as well as liabilities. Second, the actuary will be making this comment in regard to some amount of new business, as well as existing business.

The report of this committee has been studied by the CLHIA as well as the CIA, and it appears that the essential parts of it will be accepted by both bodies. As John Booth pointed out, the ACLI in the United States has decided not to support some of the parts of corresponding valuation actuary recommendations here.

Wayne Bergquist told us about the proposed compensation plan and its surplus formula. Under this proposal, the solvency of a company is monitored through a

specific formula for required minimum capital and surplus. For a company to be covered by the fund, it would need to have enough surplus to meet the formula requirements, both when it joined the fund and on an ongoing basis.

My general concern about this formula is its simplicity. Although it takes 17 pages to describe, the individual components do not reflect some of the characteristics of companies that are key to the assessment of the solvency position of a company. For example, the component of the formula covering the mismatch risk assumes a reasonable degree of matching by all companies rather than attempting to reflect the specific degree of mismatch in any given company. Also, the formula does not recognize the differing degrees of conservatism that may be involved in the underlying liability calculations.

Wayne Bergquist gave a number of reasons why it was appropriate to develop a formula of this sort. Personally, I find it easy to support this approach for the purpose of the compensation plan. Nonetheless, it is obvious that a company could be subject to many risks to its solvency that are not covered by the CLHIA formula.

Our committee, then, was faced with a dilemma. Should we ignore the formula as being useful in only a specific but limited way and independently try to establish professional standards for proper assessment of the solvency position of a company? Or should we try to marry our work in some way to this formula?

Recognizing that the formula seems to be a fact of life and that the actuarial profession should have the key responsibility in utilizing it, our committee has evolved a concept of a three-phase environment for the establishment of

solvency standards for life insurance that involves dealing with the CLHIA formula in the first phase.

Before describing the three phases, I will remind you of the discussion going on in Canada regarding the approach used to value liabilities for income-reporting purposes. Since 1978, when statutory accounting was revised, the 3 groups—the accountants, the actuaries, and the industry have been trying to define GAAP for insurance in Canada. This development is moving slowly but fairly surely, and the accountants feel they can complete the definition by the end of 1988. One of the important elements of discussion from our point of view is the degree of conservatism in liabilities. Up to now, actuarial liabilities have generally been thought of as both solvency- and income-reporting measures. It is not clear to us whether this will continue, or whether actuarial liabilities will tend to become more of an income-reporting measure, with further calculated amounts of surplus being set aside to establish the solvency of a company. In the next session there will be a discussion of the proposed policy premium method of valuation, which could easily be employed in an environment of relatively small margins for adverse deviations. Whether and when this method will be adopted for the valuation of actuarial liabilities is quite uncertain at this point. If it is adopted, it is quite possible it would only be if appropriate standards are in place for reporting on the solvency condition of a company. Such standards could, in theory, also allow for the use of the policy premium method for solvency reporting, but with more substantial margins than are used for income reporting.

With this uncertainty as to the function of the basic actuarial liability and with the development of a guarantee fund with a uniform solvency formula test, our committee felt we should envisage an environment for solvency reporting that had three phases, as follows:

1. Current phase (1987). GAAP reporting for life insurance in Canada is not yet defined. Statutory reporting is still using the 1978 rules. Solvency reporting is dealt with by the industry formula.
2. Transitional phase (1988, 1989?). GAAP is defined with possibly the policy premium method and a closer definition of the provision for adverse deviations. Statutory reporting is presumably modified consistent with GAAP. Solvency reporting is still dealt with by the industry formula.
3. Ultimate phase (1990? on). GAAP is defined. Statutory reporting is defined. Solvency reporting may or may not involve an industry formula, but if it does, the formula will be adjusted where appropriate by the valuation actuary's opinion about the solvency condition of the company. This opinion will take into account any formula that does exist.

With this three-phase environment, we felt our committee was looking at a long time frame with uncertain characteristics over which to develop standards that would permit proper opinions.

Thus, the approach we're adopting is in two directions. First, we want to develop something that addresses the current phase, and in particular, the CLHIA formula. We hope to be able to produce specific proposals for this by midyear 1987. Bill Black is going to speak on this thrust of our committee later.

Second, we want to develop a framework document that would remain relevant through all three phases. This document would contain basic principles that would be interpreted as specific guidelines in each phase.

At this point, Trevor Howes will talk to you about the basic concepts and principles we are currently discussing in our committee, which should be applicable independent of the specific environment. Bill Black will then outline an approach to dealing with the first phase of our work and, in particular, how we see addressing the CLHIA formula as part of our work.

MR. TREVOR C. HOWES: I have been asked to outline the initial conclusions of the committee regarding the general principles and concepts that should be applicable to actuaries working (voluntarily or otherwise) in the area of solvency reporting.

While our committee has been meeting regularly for the past year, much of the early discussion was general and exploratory in nature, and very much a self-education process, I believe. It was only recently that we developed our current action plan. This plan, as Dave Johnston has described, includes as one of its two main objectives the development, for education and discussion purposes, of general principles relating to solvency assessment. Accordingly, the material I am about to present is relatively untested in a broad forum, or even in our

committee in its current format, and therefore might best be described as "a personal version of a rough draft of a preliminary viewpoint, by a portion of our committee, of some of the principles or concepts that we think are important—but then again, we might be wrong"! In all seriousness, though, I believe these ideas represent the generally supported views expressed in our committee's discussions over the past year; the ideas have not evolved without some difficulty and heated debate. We encourage and welcome commentary and reactions from others and consider the public discussion of these ideas as an essential prerequisite to any attempt by the profession in Canada to take on the broadened responsibilities it seems so anxious to acquire.

We have not had much opportunity to choose carefully the most appropriate wording for various principles, or even to decide on what type of document is to be produced eventually and in what format these principles should be presented. Nevertheless, we are anxious for public exposure and consideration, both to generate feedback and to start the process of consciousness raising, as it were, that will be necessary before Canadian valuation actuaries can start to prepare themselves for the new era.

Some of this material was first conceived as components of a manual of professional standards for solvency reporting. However, prior to birth, the more realizable and less strenuous objective of a discussion paper or panel presentation presented itself as a timely and opportune way of achieving some early exposure. Perhaps as this material matures and grows in the light of examination and discussion by the profession, it can eventually be reborn in the form of more polished material suitable for professional standards.

As a last preliminary comment, I must acknowledge the committee's appreciation, even at this early stage, of the enormity of the technical problems and practical complexities facing us as we attempt to develop and recommend methods and techniques, not to mention the problems of those poor souls among us who will eventually have to use them.

Although we realize we do not yet have access to all the tools and technical support necessary to carry out the task we envisage, we have nonetheless felt it worthwhile to propose comprehensive objectives and requirements assuming any technical obstacles can be overcome.

In trying to tie together and organize a somewhat disjointed collection of accumulated ideas for this presentation, I came up with a title that, with a little stretching, covers practically anything: "The Who, Why, What, How, When, and Where of Solvency Reporting."

I'll start off immediately with posing some "who" questions for your consideration and then tell you my suggested answers; for example, Who cares? (about proper solvency assessment, I mean). Clearly, we as actuaries do, and the general public certainly should as policyholders, as potential beneficiaries, and as stockholders. Of course, the regulators do, as we've already heard described. Our employers, the companies themselves, also have a passing interest. Accordingly, if we are to accept a formal role as a profession, we are going to be held responsible in various ways by all these parties for carrying out our role capably, thoroughly, and professionally. We are also going to have to recognize and resolve the potential conflicts of interest that may arise in satisfying these diverse interests.

Another "who" question is, Who is qualified to perform this role? We have argued to the politicians that only we as actuaries are properly qualified to take on this task, and we have even hinted that we can handle other financial institutions besides insurance companies. Please note, however, that our professional standards already require us to perform professional services only when qualified to do so (Rule of Professional Conduct #4), and even this might well be considered too vague for the critical role of solvency reporting.

It is likely more appropriate for the profession specifically to require relevant training and experience, perhaps for a minimum of 2 years, before permitting a member to accept such an appointment. Furthermore, a peer review process may well be essential to provide the degree of support required and to ensure a consistency of results and of quality of work sufficient to retain our credibility with the various publics we serve.

A final "who" question is, Who do we think we are? Lest we get carried away with our own importance, it is wise to stress to ourselves, to our employers, and to all those innocent and trusting members of the public ready and willing to sue the pants off us that any statement, opinion, or report we make on solvency is no guarantee, but merely the informed judgment of a qualified professional.

Why? Why are we developing the expertise to measure and report on solvency? What is our real objective? I would submit that the real objective is not to be able to slap labels on companies for the world to see. Solvent, insolvent—aren't they dangerously close? The real objective is to prevent surplus depletion in the first place. Of course, we cannot have, and do not require, the power to do this all by ourselves, but we certainly can obtain the opportunity to advise company

management on the impact of alternative courses of action, as well as help them steer what we believe to be the safe course, should they choose to do so. Accordingly, we must educate ourselves on the various risks potentially affecting financial soundness and on new techniques to measure and assess them; we must also educate company managements on the same things so that our advice will have credibility and some reasonable likelihood of being understood and acted upon.

In the meantime, while we are developing the knowledge and tools required to do a thorough job, let's not ignore the possibility that existing tools and techniques might well be applied to monitor and project surplus trends, as well as perhaps to help provide an early warning where none now exists. After all, our ultimate goal is prevention, not perfection.

What? What is it we are assessing? What is the task we must perform in order to prepare a report on solvency? We feel that a proper assessment will have two components. First, it will verify the solidity of the enterprise at the specific statement date in question. Second, it will confirm the management's expectation of vitality existing at, and continuing beyond, the statement date for some minimum period—probably up until the next statement date, but at least for as long as the momentum period of the operation.

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What does solidity at a statement date mean? Solidity exists if assets exceed reserves, other liabilities, and designated surplus on a valuation date. Designated surplus is that amount of assets in excess of reserves and other liabilities required to provide for plausible deviations from expected, arising from the existing business on the valuation date. A key aspect of this definition

is that it is a "snapshot measurement"—it relates only to the company's known status at a specific date, based on business transacted up to that time.

Vitality, in contrast, refers to ongoing solidity and corporate wellness. It is measured by the size and dynamics of the excess of assets over those required to assure solidity over a period of time. The degree of vitality will determine a company's ability to grow and carry out its business plans, as opposed to merely surviving. This concept thus requires the evaluation of events occurring since the statement date and projected to occur in the future.

Should this ambitious interpretation of the scope of our interest as covering future events and future new business surprise some of you, I will point out that it is explicitly contemplated by Recommendation No. 1 of the Crawford Committee report on the Role of the Valuation Actuary, as mentioned by earlier speakers. Clearly, the actuary will have a difficult responsibility in producing a report on the impact of the more distant future events according to his understanding and interpretation of the company's formal strategic plans. Many of us may feel this is either an absurdly unrealistic goal or an attempt to intrude on the sacred prerogatives of company management. What is perhaps less arguable and more critical is the need to project the impact of events that occur immediately after the statement date and before a newly alerted management can take corrective action or the regulatory authorities can wrest control.

What is that minimum period I mentioned for measuring vitality, the "momentum period"? This refers to the shortest period following a statement date during which a threat to solvency can be identified and action implemented to amend the terms under which new obligations are undertaken, or to ensure that existing

commitments can be honored. I think of it as the time needed to gain full control, in time of emergency, to either change course or else stop all engines.

Accordingly, a minimum standard of assessment for purposes of a public report must consider vitality over a period at least as long as the momentum period, and probably up to the next reporting date. If the actuary is preparing an internal report for management purposes, his time frame for vitality assessment would likely extend much longer—probably as far, or farther than, the strategic planning horizon.

The preceding are attempts at definitions for terms that may or may not be new to you. They may not be well phrased yet or clear in meaning, and I will attempt in a minute to explain some further implications we see in them. First, though, I should state that our conscious intent is to be consistent in terminology, where possible, with the Society of Actuaries' work in this area. Several of the terms just used and defined have been adopted (and, I hope, correctly) from published materials we have read.

In particular, the related terms "solidity" and "designated surplus" both appear in the recent work on valuation principles, and as such they are considered to apply only to existing business as of a statement date. Let me repeat our contention that "solidity" by itself is an inadequate criterion for a minimum assessment of solvency without consideration of the "vitality" concerns as just discussed.

I used another common term in the definition of designated surplus, which is often thrown around in discussions of solvency matters: "plausible deviations from expected." Our committee has not devoted much discussion to an exact

definition of this term, perhaps because we seem to be comfortable using it without defining it precisely. A first stab at explaining it might be the following: "plausible deviations" refer to those variations from anticipated experience that can be envisaged, are generally accepted as credible, and have material probability of occurrence. You will note that we have still studiously avoided attaching specific probabilities to the term. Nonetheless, if this phrase is to be a part of our formal standards by which we wish to achieve some consistency of results, we will need to be sure ambiguities in definitions are kept to a minimum.

Let's go back over my description of the overall task and expand a little more. The actuary wishes to verify solidity by confirming that sufficient assets exist to cover liabilities and his calculated requirement of designated surplus. To do this, he cannot focus entirely on surplus itself, or on actuarial liabilities, or on any other one component of the balance sheet; instead, he must review and reassess, if necessary, all assets and liabilities, looking at all items individually, collectively, and in combination with one another. Considering the basis on which the values of these items are determined in the balance sheet, he must satisfy himself as to the total additional surplus required to provide the additional margin of safety beyond anticipated experience that is sufficient to allow for all plausible deviations from expected. In conducting his review, he must consider, explicitly or implicitly, all risks inherent in the company's business that have the potential for material impact on the financial condition of the company.

This is probably a good point at which to repeat my early remark regarding the enormity of the task facing us. Consideration of all risks and the execution of

what appears to be a major, if not total, revaluation of balance sheet items is certainly not an undertaking to be sneered at, and that's not all that has to be done.

Assuming he can verify solidity at the statement date, the actuary must then concern himself with the direction in which the company is actually moving at the statement date and its plans for the period immediately following, as well as analyze the impact of these financial changes on assets and liabilities and thus on the surplus levels available for vitality purposes. As stated earlier, the actuary's analysis should extend at least as far as the momentum period described, and depending on the form of opinion he may be providing, the analysis would likely extend to the next statement date.

Although the immediate goal may be the completion of an opinion or the filing of a financial statement or a report to management, the actuary's responsibilities do not end with the completion of that task. Accordingly, while he may rely, out of necessity, on deterministic estimates in valuing assets and liabilities or in calculating the required amount of designated surplus, he must be aware of the impact individually and collectively of each of his assumptions and of the sensitivity of the results to changes in the assumptions. He must also be prepared to monitor actual events between reporting dates on a sufficiently timely basis so as to alter or refine his assessments, and, he must report such changes in conclusions as may be required by the unfolding circumstances and his changing perspectives on the future. This aspect of a continuing and ongoing responsibility was specifically envisaged by the third Recommendation of the recent Crawford Committee report.

Having summarized the essential "what" of the task, the next question is "how": how to accomplish the task and how to organize the problem into manageable action steps.

Before starting to tackle this question, I have to emphasize that the specific ideas I'm about to describe are not so much accepted and immutable principles as proposed concepts for consideration. I personally have encountered difficulty with the variety and complexity of asset/liability environments, risk factors to be considered, and potential techniques for investigating or evaluating each. I've often wanted some overall framework into which all these complex issues could be slotted and evaluated as a part of a bigger process.

In addition, I've felt our committee (and perhaps others, such as the CLHIA subcommittee on solvency testing) has been overly concerned at times with certain issues, such as the relative merits of an add-on adjustment to balance sheet liabilities versus a total revaluation on a new basis. In our evolving and unstable environment, we need a conceptual approach that can adapt to a variety of techniques and methods, to the various corporate situations that must be accommodated, and to changing regulatory requirements and financial reporting practices. Furthermore, I feel it is important to avoid confusing the issue of how to report the results of a solvency assessment with the choice of available methods of making that assessment. Accordingly, although a specific portion of capital and surplus, referred to earlier as designated surplus, may appear in the balance sheet and thus be considered as an "add-on" figure, this should not rule out the possibility of a second valuation of liabilities or assets as one potential technique in the overall process of developing that number.

As an attempt to provide a general conceptual approach that accommodates these concerns, I imagine the task of solvency assessment to be composed of a number of stages or steps. I see an initial stage to be a preparatory one, of course, of laying down groundwork, such as defining the entity to be assessed and the specific balance sheet (that is, date and purpose) for which the calculations are required. Part of the preliminary work will also include planning the remaining steps of the task. The details of these steps will depend on the types and sources of risk factors that the actuary judges to have material impact; the area of the balance sheet and the level at which these risks have their impact; and the techniques, tools, and resources at the actuary's disposal.

Let me elaborate a little. Risk factors can, in general, be considered to affect these four areas: (1) assets only; (2) liabilities only; (3) assets and liabilities, as well as their interrelationship; and (4) the company in general, without a direct link to a balance sheet item. You may note that these four categories correspond fairly closely to the allocation of risks as C-1, C-2, C-3, and C-4, respectively.

A risk affecting a given asset or liability may be considered to have an impact at various levels. The lowest level is on individual asset or liability items. A risk factor at this level can be anticipated by an explicit or implicit margin in an assumption or a specific factor in a valuation model, which is then applied directly to an inventory of assets or liabilities, as the case may be. For example, the risk of misestimation of the expected level of mortality in an insurance

contract may be tackled by adding on margin to the mortality assumption used in a traditional actuarial reserve calculation. Or the risk of a mortgage default might be reflected by a margin in the assumed yield rate used to discount future payments.

The second level of impact is by a group or portfolio of assets or contract liabilities, such as product line or line-of-business groupings. Risks having an impact at this level may be quantified as in the first level, by explicit margin, or perhaps more appropriately by an advanced statistical method such as a stochastic approach to a risk of fluctuation or by a worst-case scenario projection method. Results of these latter methods are generally in the form of an aggregate provision for the grouping or portfolio examined. Examples include: (1) the risk of excess death claims due to random fluctuation, for which an advanced statistical model might be used to predict the probability of such losses as a function of the total amount exposed to risk, and the distribution by age and size; and (2) the risk of asset/liability mismatch, which might be analyzed by a cash flow projection model applied to various corresponding segments of assets and liabilities.

The third level of impact could be described as either on the total company or perhaps of indeterminate level. Risks at this level will generally require formula approximations or perhaps arbitrary provisions not specifically related to the actual volume of any asset or liability item. Catastrophic or general business risks for which quantification is impractical or impossible could be considered in this way. For example, catastrophic claim occurrences or asset destruction, as well as the risks of business fraud or management incompetence, could be included in this category. Also, it may be appropriate to make a final

adjustment in total requirements based on the combinations of asset portfolios and liability lines of business.

On the basis of this kind of analysis, then, the middle stage in the overall task will basically develop the total designated surplus in a layered approach. The first and foundation layer would be calculated by the reassessment and possibly total revaluation of each individual balance sheet item, probably using traditional methods. Individual assumptions used may or may not be the same as those used for calculating balance sheet values, although it is likely the substitution of margins for "plausible" deviations, rather than "reasonable" deviations, will be considered appropriate.

The actuary would then add a second layer of portfolio-based adjustments to the first layer by the application of various more advanced methods or "add-on" formula components that reflect the results of such advanced methods, measure the interdependence of items, and reflect risks having impact at the second level.

Lastly, he would consider the final adjustments to designated surplus relating to companywide or general risks classified as having impact at the highest level.

While a quick verbal description of my concepts of areas of impact and levels of impact of risks may be difficult to grasp, my essential point is that since the actuary is concerned about a wide variety of risk factors, and since he will have

various techniques or combinations of techniques at his disposal, he should make an effort to organize the risks in a form that allows him to choose the methods best suited to the circumstances, as well as to satisfy himself that the impact of all such risks will be adequately addressed.

Having arrived at total designated surplus using whatever combination of techniques and methods is appropriate to the circumstances of that company in this middle stage of his assessment, the actuary would, in the final stage, evaluate the impact on his calculations of projected experience in the subsequent reporting period. He would study both existing business and new business expected to be written, as well as the projected change in asset composition, all based on known business plans and management policies. This step, of course, permits the assessment of the projected vitality of the company over the required period of time.

Having thus neatly disposed of the "how-to" question (in 2,500 words or less), I'll now press on to the final two words in my original list: "when" and "where". By these I mean, What are the prerequisites and conditions required for an adequate assessment?

It is clear that to assess properly the financial condition of a life company and make projections of the likely direction and degree of change in that condition, a complete and thorough analysis is required, which must be based on close contact with the company in question. This is necessary both to ensure that all material risks have been considered and properly assessed, and to permit an informed projection of results, taking into account current plans and new directions in which the company may move. Continuous contact and access to senior

management may also be required to permit timely advice to management as changes to the internal or external environment occur.

For adequate thoroughness, the actuary should address at least the following areas:

1. Familiarity with the subject company, including the following:
 - a. Its insurance products and contracts in force and currently being sold.
 - b. Its marketing and underwriting policies, systems, and practices.
 - c. Its investments, investment policies, and appraisal practices.
 - d. Its reinsurers, reinsurance agreements, and retention policies.
 - e. The management structure, quality, and philosophy.
 - f. The corporate philosophy and strategic plan, including the distribution of surplus among policyholders and/or shareholders.
2. A review of underlying financial data for the company and the systems for generating, editing, and maintaining them, with attention to accuracy, completeness, timeliness, and ease of access.
3. A consideration of the appropriate minimum momentum period for the operation and for various segments of the operation (such as investments versus marketing) or for various product lines (individual annuities, group contracts, etc.), so as to establish proper routines for monitoring ongoing results and to permit adequate extrapolation periods for significant trends that may adversely affect surplus.

In talking about my assigned topic, I undoubtedly missed some points that some of you may feel belong in any compilation of basic principles. If so, as stated earlier, we on the committee would be delighted to receive any and all commentary or other contributions toward our goals.

MR. WILLIAM A. BLACK: Both inflationary growth in sales and the shrinking of profit margins have led in recent years to decreasing levels of surplus for life insurance companies operating in Canada. At the same time, there has been a growing concern about the solvency of financial systems of all types. Two banks, several trust companies, and a number of casualty companies have become insolvent; others have been forced to merge. So far there have been no such insolvencies of life insurance companies.

What is the role to be played by actuaries and, in particular, valuation actuaries in the management of this crucial issue? What are the questions they should be addressing? What kind of independence do they need in order to perform their role? How and to whom should they report?

Historically, the actuary has tended to focus on the liability portion of the balance sheet. It has become increasingly clear, however, that it is impossible to discuss liabilities without also reviewing the assets that are intended to back them up. The methods for evaluating them both must be sound and mutually consistent.

In fact, the recent report of the Special Committee on the Role of the Valuation Actuary states clearly in its first recommendation that the valuation actuary has to take responsibility for all aspects of the balance sheet:

Recommendation 1: That in addition to the present requirements for the completion of valuation reports for life and health insurance companies, the Valuation Actuary be required to report on the ability of the company to meet its future obligations with respect to existing business and anticipated future new business.

In this paper it is assumed (as seems likely) that this recommendation will gain wide acceptance both within and outside the actuarial profession. We are therefore considering the situation where the actuary works with all three portions of the balance sheet—namely, assets, liabilities, and surplus (including capital). We are focussing here on the last of these three elements.

This is not to pretend for a moment that surplus can be considered on its own, any more than liabilities can be evaluated independently of assets. But there seems to be a particular need, in the Canadian context, for statements to actuaries about how to discuss surplus. As the preference grows for reserve patterns that produce smooth emergence of profits, it becomes increasingly important to have surplus standards as protection against unexpected adversity.

WHAT IS SURPLUS?

A great deal has been written about the nature and uses of surplus. Generally, it seems to boil down to two things: (1) provisions for fluctuations or deviations and (2) provisions for investment in new business. What is available for (2) usually turns out to be whatever is left after appropriate provisions have been made for

(1). Of course, it can be redetermined each year and will be increased as profits emerge from existing business.

In Canada the amount of surplus consumed by strain from new business has been reduced since the 1978 valuation changes and may be further reduced if the ceiling on expense amortization is eliminated or if the policy premium method of valuation is adopted. Increasingly, then, surplus is where we provide for those improbable but not implausible deviations and fluctuations.

Let us assume that the actuary has performed, after appropriate study of the company's assets and other relevant factors, the valuation of liabilities in accordance with the recommendations of the profession in Canada. How, then, is he to speak to the question of surplus adequacy?

One can easily imagine a whole array of erudite and sophisticated calculations: deviations from the mean, deviations of the means, stochastic models, worst-case scenarios, etc.—banks of computers purring contentedly into the night. Unhappily, there is some doubt as to whether the outcome of such work will be taken seriously by company management, at least if the results are unfavorable.

This is true, in part, because there does not exist in the current Canadian context a body of literature, generally understood and endorsed, around which the profession can unite and to which a particular actuary can point for independent support of his work. In fact, it is quite likely that different actuaries, working with the same companies and the same information about those companies, would come to widely differing conclusions about the adequacy of surplus levels. (Indeed, there are some grounds for pessimism that valuations

of the same liabilities performed by different valuation actuaries would fall within an acceptably narrow range.)

While the profession has been contemplating these issues, certain realities have begun to intrude into the theoretical environment:

1. In 1983 the federal Department of Insurance commissioned Dr. Allan Brender to produce a paper on adequacy of surplus levels. One result was a draft formula that has since been considerably refined by a CLHIA committee.

Many members of the profession may find a formula surplus requirement distasteful, not only because of its theoretical weaknesses, but also because of the implication that the profession is losing its chance to influence this issue. From the point of view of the regulatory authorities, however, the concept of a formula makes eminent sense. Their job, after all, is to protect the public (at a minimum cost to the taxpayer) from bad luck and/or bad management of the company, most likely the latter. Companies with surplus problems may be either unwilling or unable to support a sophisticated and objective actuarial evaluation of surplus adequacy.

What the regulatory authorities need is a test that can be done quickly and easily, and they need the authority, if the test is not met, to usurp some or all of the management control of the company. Once such a test has been stipulated, management has to learn to live with it, whether or not the formula is viewed as having theoretical

merit. The purpose of the surplus formula is to provide a buffer zone—enough surplus to last between the time when a problem is identified and the time when regulators can take control away from management.

2. On June 26, 1986, the minister of state for finance tabled legislation that would allow the minister to prescribe required levels of surplus, as well as to take control of the assets of a company that did not meet the test. It seems likely that the method of prescription will be by formula. (It is assumed that the bill will be reintroduced in the new session of Parliament.)
3. Industry discussions of a guarantee fund are continuing. It now seems likely that such a fund will be established, and regulators are being urged to make membership in the fund a prerequisite for the writing of new life insurance business.

Where, then, does this leave company management? As is pointed out in the Society of Actuaries exposure draft on life company valuation principles, management of surplus is preeminently a management prerogative. The actuary is the professional advisor in the exercise of this management.

What kind of advice is management going to want? Is it going to want to hear about deviations from the mean, deviations of the mean, stochastic models, worst-case scenarios, etc.? Not exactly. What management is going to want to know at the end of year X is this:

1. How does our surplus compare with the required formula at the end of the current year?

2. How can we expect our surplus levels to compare with the formula requirements in the next few years, based on our business plan for sales and expected experience on mortality, interest, expenses, terminations, etc.?

3. How might our actual surplus versus formula requirements behave in the future, assuming certain pessimistic-but-not-impossible deviations from the assumptions in number 2?

Calculation of the current formula is, of course, a purely mechanical exercise. But it can be seen that the estimations in number 2, and even more so in number 3, require the same scientific principles as the purely theoretical exercise described above. It's really just a different way of phrasing the same type of question.

For how many future years should such a projection be done? Perhaps a very long term forecast is required. Surely there are some limitations, however, especially since the imaginary valuation at the end of the projection period should reflect the deterioration in experience during the projected years. Once the numbers extend much beyond the current planning horizon, they take on an aura of unreality. As a practical matter, doing this for even a few years is going to be a complex task.

Some actuaries might argue that simply testing the sensitivity of the current-year reserves, together with 1- or 2- year forecast of profits (after allowing for the cost of expected new business), will do the job. The problem with this is that it may cause the actuary to assume an unrealistically rapid deterioration in experience or to ignore a potential adversity because "things can't get bad that fast." If there is a long-term deterioration in an experience factor, it is likely to occur gradually rather than instantaneously. The time frame over which a deterioration occurs is important, because it determines how much latitude management has to respond. Thus, the actuary's assumption about the rate of deterioration may be as important as his assumption about how bad things might get.

In what follows, it has been assumed that the projection will be done for years. This is certainly enough time to allow for gradual shifts in experience, and it will be at or beyond the planning horizon for most companies.

The implementation of a required surplus formula does not represent an obstacle to a scientific consideration of surplus requirements; it simply suggests a particular channel by which to make that scientific evaluation.

The profession collectively has an especially important role to play in guiding and supporting individual actuaries on this topic. Crucial decisions by management, and potentially by regulators, will depend on the actuary's view of the company's surplus prospects. When the going gets tough, it will be important for the actuary to show consistency of his work with well-established professional standards. What follows will suggest how these standards might look and will indicate the kind of report the actuary might make, and to whom.

STANDARDS FOR SCENARIO TESTING

It can be imagined that the manifestation of the "most likely case" scenario (type B) would involve assumptions consistent with a valuation that was done at the end of year X. Consistent does not mean equal. Where the actuary feels he has margin in a valuation assumption, it will be appropriate to reflect emergence of profit from that margin during the forecast period.

What is desired is a preview of the balance sheet at the end of year X + 5, so the actuary must forecast his assets and liabilities at that time. To do so, the actuary must know about assets maturing during the next 5 years and must forecast how management might reinvest them. He must make a forecast of profits emerging from the various sources, as well as of future new business.

He will then have to perform an imaginary valuation at the end of year X + 5. This valuation will, in most cases, not use the same assumptions as the current-year valuation, particularly in respect to interest rates. For example, the theoretical asset block five years hence may well have a different average duration. The characteristics of the future asset block, along with the investment prospects at the time, will determine the putative valuation basis.

Especially in the first few years of its use, the type B calculation will be iterative. Based on the actuary's first calculations, company management may well change its plans as to future new sales, investment mix, or other strategies.

Implementation of the above kind of estimation, and especially the future valuation, could be quite difficult. Even more difficult will be testing of the type C scenarios. These will each involve testing of one or more unfavorable

deviations in experience factors. Compared with the type B estimation, there are two added complications:

1. The actuary must imagine how, in the future valuation, he will reflect the assumed unfavorable experience that has occurred during the five-year interval. For example, one scenario might involve new investment rates dropping by 300 basis points in a straight line over the interval. Clearly, the investment income assumption in the future valuation must assume new investment interest rates no higher than those implied by the scenario assumption for the end of the five-year period. Thus, although the scenario test may be limited to five years, manifestation of its unfavorable climate throughout the remaining life of the policies will be implicit in the then-assumed valuation.
2. The actuary must make certain assumptions about how management will behave in the face of adversity. It is reasonable for the actuary to ask, during the type B evaluation, how management intends to respond to the most likely circumstances. It is not reasonable, however, for management to be asked in advance how it will deal with a whole array of possible adverse circumstances. Management will, quite reasonably, want to wait to see what else is happening at the time. But it will not be satisfactory for the actuary to assume that management will ignore adversity when it occurs. For example, the actuary must consider whether, in a declining interest rate scenario, management will change the targets for new business mix or volume, or the asset-liability matching strategies.

To help the actuary perform in this role, the profession has to provide him with technique papers on estimation, a number of stipulated adverse scenarios that must be tested, and guidance in selection of additional scenarios to be tested. To facilitate the development of both the profession's overall understanding and individual effectiveness, a workable peer review and support process will be needed.

SOLVENCY REPORTING

Having completed his research, the actuary must now report his conclusions. How and to whom these are reported are just as crucial as the methodology used in reaching the conclusions.

Neither a totally public nor a totally private reporting protocol seems satisfactory. In a totally public environment, the actuary would be under tremendous pressure to suppress any unhappy conclusions he may have reached, especially those emanating from the pessimistic scenarios. Also, the very publication of such an opinion might doom a company that would otherwise have survived—hardly a desirable result.

Neither does a totally private process recommend itself. If internal management isn't all that anxious to receive the reports, there is some danger that work will not be done or will not be done thoroughly. Also, both regulatory authorities and a guarantee fund could benefit tremendously from some kind of distant early warning about potential problems. Accordingly, the following two-pronged reporting system is advocated.

PUBLIC REPORT

The actuary would make his normal published statement about the valuation of reserves. The actuary would also report the result of the current-year surplus test against a prescribed formula:

1. Normally, of course, the actuary will simply report that the test has been satisfied.
2. In some cases the test may not have been satisfied, but the company may have been able to satisfy the regulatory authority that satisfactory steps had been taken to improve the situation. If this is the case, both facts should be publicly reported, even at the risk of further damage to the company.
3. Of course, if neither of the above conditions apply, the regulatory authorities will probably take control of the company's assets.

PRIVATE REPORT

The private report would be available to the company's board of directors; the regulatory authority; and the guarantee fund, if one exists. In this, the actuary would report the outcome of his testing against his expected future scenario, those other future scenarios prescribed for testing by the profession, and such other scenarios he felt were appropriate to test under the circumstances.

It would be a cause for some concern if a company were maintaining a business plan under which it would expect to fail the surplus test in a future year, even under normal expectations. There should be rather less concern, however, if a

company's surplus situation were forecast to deteriorate under some of the pessimistic scenarios. In fact, one might imagine that a number of otherwise healthy companies might be expected to be in this situation at the end of any particular reporting period.

The great value of these reports is the advance indication that a company is particularly vulnerable to certain adverse circumstances. Highlighting these vulnerabilities will aid both regulators and management. For example, if it is determined that a company is vulnerable to rapidly rising interest rates, the onset of such an increase would be sufficient to trigger action, without the need to wait for completion of the current reporting period.

More important than a company's indicated vulnerability in a particular year's report will be how that vulnerability recedes or advances from one year to the next. By reporting on the progress against such vulnerabilities, the actuary will both aid regulators in their duty to protect the public and guide management in the choice of strategies for maintaining solvency.

When one or more of the scenarios tested produces an unfavorable conclusion, it may well provoke a closer inspection of the valuation of liabilities that has been performed. Although superficially this may appear threatening, in fact, the valuation actuary may well welcome this kind of external support for methods he has been using.

Even if all of the scenarios were to test successfully, it would be presumptuous for the actuary to give as his opinion a global certification of solvency. We are still at a primitive stage of development, and he should restrict himself to a description of scenarios tested and the outcome of those tests.

In the actuarial literature one can find a variety of definitions of "solvency." What is implicitly being used here is rather more pragmatic and perhaps less actuarial. "Solvency" here means that the company's financial affairs are such that the regulatory authorities allow management to maintain control over the company. In this context there are obviously degrees, since a superintendent may impose certain conditions on a company without displacing management from its function.

FUTURE EVOLUTION

If the profession in Canada chooses to follow this approach, one might imagine the following kind of evolution:

1. We need technique papers describing how actuaries should develop and test scenarios.
2. The profession needs to create a short list of carefully considered "prescribed" scenarios, which must be tested for every company.
3. An effective peer review process is required both for valuations and for solvency testing.

4. No doubt all of the theoretical work will benefit tremendously from the results of the early years of practical implementation. Insights will be gained into both methods and assumptions, and it is hoped that a body of literature will arise that can aid actuaries in their work.

5. It will be discovered that there are certain types of risk that do not benefit from having the solvency question addressed in this fashion. These will reveal themselves as practical work is done, and other methods for approaching them will be advocated.

6. Insight will be gained into what constitutes a good or bad required surplus formula. As well as being easily and quickly calculable, the formula should produce a surplus level that does not deplete too quickly as a result of adversities. This doesn't change the fact that once a formula is in place, the theory on which it is developed becomes secondary. The actuary has to deal with it as a given in the equation, like the rules for bringing capital gains or losses into income.

In summary, it is felt that the profession has to deal with a formula surplus requirement as a regulatory reality, at least for the foreseeable future. We can best contribute to discussions of solvency management by providing forecasts of how actual surplus might perform under various scenarios. The results of these forecasts should be made available to both boards of directors and regulators.

There are other valid ways of approaching the solvency issue. However, to proceed without directly recognizing the emerging regulatory realities is to risk becoming irrelevant to the whole solvency discussion.