



Canadian Institute of Actuaries Standards of Practice

January 2008

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1000—GENERAL

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1100 INTRODUCTION

1110 DEFINITIONS

- .01 Each term set over dotted underlining has the meaning given in this section and has its ordinary meaning otherwise (e.g., external user).
- .02 Accepted actuarial practice is the consensus of the actuarial profession on how work should be done. [*pratique actuarielle reconnue*]
- .03 Actuarial cost method is a method to allocate the present value of a plan's obligations to time periods, usually in the form of a service cost and an accrued liability. [*méthode d'évaluation actuarielle*]
- .04 Actuarial present value method is a method to calculate the lump sum equivalent at a specified date of amounts payable or receivable at other dates as the aggregate of the present values of each of those amounts at the specified date, and taking into account both the time value of money and contingent events. [*méthode de la valeur actuarielle*]
- .05 Anti-selection is the tendency of one party in a relationship to exercise options to the detriment of another party when it is to the first party's advantage to do so. [*antisélection*]
- .06 Appointed actuary of an entity is an actuary formally appointed by the entity to monitor the financial condition of that entity. [*actuaire désigné*]
- .07 Appropriate engagement is one which does not impair the actuary's ability to conform to the rules. [*mandat approprié*]
- .08 Benefits liabilities are the liabilities of a plan in respect of claims incurred on or before a calculation date. [*obligations liées aux prestations*]
- .09 Best estimate means without bias, neither conservative nor unconservative. [*meilleure estimation*]
- .10 Calculation date is the effective date of a calculation; e.g., the balance sheet date in the case of a valuation for financial statements. It usually differs from the report date. [*date de calcul*]
- .11 Case estimate at a calculation date is the unpaid amount of one of, or a group of, an insurer's reported claims (perhaps including the amount of claim adjustment expenses), as estimated by a claims professional according to the information available at that date. [*évaluation du dossier*]
- .12 Claim adjustment expenses are internal and external expenses in connection with settlement of claims. [*frais de règlement des sinistres*]
- .13 Claim liabilities are the portion of policy liabilities in respect of claims incurred on or before the balance sheet date. [*passif des sinistres*]
- .14 Contingent event is an event which may or may not happen, or which may happen in more than one way or which may happen at different times. [*éventualité*]

- .15 Contribution is a contribution by a participating employer or a plan member to fund a benefits plan. [*cotisation*]
- .16 Definitive means permanent and final. [*décision définitive*]
- .17 Development of data with respect to a given coverage period is the change in the value of those data from one calculation date to a later date. [*matérialisation*]
- .18 Domain of actuarial practice is the measurement of the current financial implications of future contingent events. [*domaine de la pratique actuarielle*]
- .19 Early implementation means the implementation of new standards before their effective date. [*mise en œuvre anticipée*]
- .20 Earnings-related benefit is a benefit whose amount depends on the recipient's earnings. [*régime salaire de carrière*]
- .21 External user is a user who is not an internal user. [*utilisateur externe*]
- .22 External user report is a report whose users include an external user. [*rapport destiné à un utilisateur externe*]
- .23 Financial condition of an entity at a date is its prospective ability at that date to meet its future obligations, especially obligations to policyholders, members, and those to whom it owes benefits. Financial condition is sometimes called "future financial condition". [*santé financière*]
- .24 Financial position of an entity at a date is its financial state as reflected by the amount, nature, and composition of its assets, liabilities, and equity at that date. [*situation financière*]
- .25 To fund a plan is to dedicate assets to its future benefits and expenses. Similarly for "funded" and "funding". [*capitaliser*]
- .26 Going concern valuation is a valuation which assumes that the entity to which the valuation applies continues indefinitely beyond the calculation date. [*évaluation en continuité*]
- .27 Indexed benefit is a benefit whose amount depends on the movement of an index like the Consumer Price Index. [*prestation indexée*]
- .28 Insurer includes a fraternal benefit society and the Canadian branch of a foreign insurer, but does not include a public personal injury compensation plan or a government monopoly. [*assureur*]
- .29 Internal user is the actuary's client or employer. Internal user and external user are mutually exclusive. [*utilisateur interne*]
- .30 Internal user report is a report all of whose users are internal users. [*rapport destiné à un utilisateur interne*]

- .31 Margin for adverse deviations is the difference between the assumption for a calculation and the corresponding best estimate assumption. [*marge pour écarts défavorables*]
- .32 New standards means new standards, or amendment or rescission of existing standards. [*nouvelles normes*]
- .33 Periodic report is a report that is repeated at regular intervals. [*rapport périodique*]
- .34 Plan Administrator is the person or entity with overall responsibility for the operation of a benefit plan. [*administrateur d'un régime*]
- .35 Policy liabilities in an insurer's balance sheet are the liabilities at the balance sheet date on account of the insurer's policies, including commitments, which are in force at that date or which were in force before that date. [*passif des polices*]
- .36 Practice committee means the committee or committees, either standing or ad hoc, to which the Practice Standards Council has assigned responsibility for the practice area which particular new standards affect. [*commission de pratique*]
- .37 Premium liabilities are the portion of policy liabilities which are not claim liabilities. [*passif des primes*]
- .38 Prescribed means prescribed by these standards. [*prescrit*]
- .39 Provision for adverse deviations is the difference between the actual result of a calculation and the corresponding result using best estimate assumptions. [*provision pour écarts défavorables*]
- .40 Public personal injury compensation plan means a public plan whose primary purpose is to provide benefits and compensation for personal injuries. The compulsory coverage, monopoly powers, and assured continuity of these plans require the selection of methods and assumptions which differ from those which are appropriate for a comparable benefits plan provided by the private sector or by an insurer. The Canada Pension Plan, the Quebec Pension Plan, and the pension provided by the Federal Old Age Security Act are excluded as their primary purpose is the provision of retirement income. [*régime public d'assurance pour préjudices corporels*]
- .41 Recommendation means an italicized recommendation in these standards. Similarly for “recommend”. [*recommandation*]
- .42 Report is an actuary's oral or written communication to users about his or her work. Similarly for “to report”. [*rapport*]
- .43 Report date is the date on which the actuary completes the report on his or her work. It usually differs from the calculation date. [*date du rapport*]
- .44 Report pursuant to law is a report for which the law requires an actuary's opinion. [*rapport en vertu de la loi*]
- .45 Rule means a rule in the Institute's Rules of Professional Conduct. [*règle*]
- .46 Scenario is a set of consistent assumptions. [*scénario*]

- .47 Service cost is that portion of the present value of a plan's obligations which an actuarial cost method allocates to a time period, excluding any payment for that period in respect of unfunded accrued liability. [*cotisation d'exercice*]
- .48 Standard reporting language is standard language for an external user report. [*libellé du rapport type*] [1810](#)
- .49 Subsequent event is an event which occurs after a calculation date but before the corresponding report date. [*événement subséquent*]
- .50 Use means use by the actuary, usually in the context of use of another person's work. [*utilisation*] 1110.21
1110.29
1810.01
- .51 User means an intended user of the actuary's work. [*utilisateur*]
- .52 Virtually definitive means to become definitive upon completion of one or more actions which are seen as formalities. [*pratiquement définitive*]
- .53 Work means the actuary's work within the domain of actuarial practice and usually includes
- acquisition of knowledge of the circumstances of the case,
 - obtaining sufficient and reliable data,
 - selection of assumptions and methods,
 - calculations and examination of the reasonableness of their result,
 - use of other persons' work,
 - formulation of opinion and advice,
 - reporting, and
 - documentation. [*travail*]

1120 INTERPRETATION

Recommendations

- .01 These standards are binding on Fellows, Associates and Affiliates of the Canadian Institute of Actuaries.
- .02 The standards consist of recommendations and other guidance.
- .03 A recommendation is the highest order of guidance in the standards. Unless there is evidence to the contrary, there is a presumption that a deviation from a recommendation is a deviation from accepted actuarial practice.
- .04 Each recommendation is in *italicized text*, followed by its effective date in square brackets.

Other guidance

- .05 The other guidance supports and expands upon the recommendations and is in roman text. The other guidance consists of definitions, explanations, examples, and useful practices.

Effective date of recommendations

- .06 The effective date is usually unrelated to the report date. A superseded recommendation may continue in effect if work is delayed. The notice of adoption would discuss such a case.
- .07 The following four paragraphs (subject to the notice of adoption of new standards in a particular case) describe the application of the effective date to a recommendation in new standards.
- .08 For work related to a fiscal period or periods, a recommendation applies if the first day of the fiscal period is on or after the recommendation's effective date. For example, a recommendation applies
- to work on financial statements if the accounting period of the financial statements begins on or after the recommendation's effective date,
 - to advice on funding a benefits plan during periods which begin on or after the recommendation's effective date, and
 - to dynamic capital adequacy testing if the opening day of the related forecasts is on or after the recommendation's effective date.
- .09 For work related to an event, a recommendation applies if the date of the event is on or after the recommendation's effective date. For example, a recommendation applies
- to work on the wind-up of a benefits plan if the wind-up is effective on or after the recommendation's effective date, and
 - to work on the transfer of policies from one insurer to another if the transfer is effective on or after the recommendation's effective date.

- .10 For calculation of a capitalized value, a recommendation applies if the calculation date is on or after the recommendation's effective date. Examples are the capitalized value of pension plan benefits for a marriage breakdown or for termination of membership in the plan.
- .11 For other work, a recommendation applies if the report date is on or after the recommendation's effective date.

General standards and practice-specific standards

- .12 The standards consist of general standards and practice-specific standards. With the exception noted below, the general standards apply to all areas of actuarial practice.
- .13 Usually, the intent of the practice-specific standards is to narrow the range of practice considered acceptable under the general standards. For example, the practice-specific standards for selection of a margin for adverse deviations for valuation of the policy liabilities of an insurer narrow the range of practice which would be acceptable under the corresponding general standards.
- .14 In exceptional cases, however, the intent of practice-specific standards is to define as acceptable a practice which would *not* be acceptable under the general standards, in which case that intent is specifically noted by words in a practice-specific recommendation like: “*Notwithstanding the general standards, the actuary should...*”, followed by a description in roman text for the exception.

Drafting

- .15 “Should” is the strongest mandating word in the standards, appearing only in recommendations, often in the expression, “The actuary should...”.
- .16 “Would” is a suggestive word appearing in the roman text, often in the expression, “The actuary would...”, and is less forceful than the mandative “should”.
- .17 “May” is a permissive word, appearing in both recommendations and the roman text, often in the expression, “The actuary may...” and often with conditions attached. It defines a safe harbour. For example: in Section 1610.01, the recommendation is that “*The actuary may use and take responsibility for another person's work if such actions are justified.*” and the roman text describes steps which constitute justification. The actuary who is satisfied that the actions are justified has done all that may be reasonably expected and has therefore complied with accepted actuarial practice, even if the use turns out not to be well-founded. 1610
- .18 The standards provide guidance **only** on accepted actuarial practice. 1310
- .19 The examples are often simplified and are not all inclusive.

Lay readers of the standards

- .20 The standards are drafted as much as possible in ordinary business terminology rather than technical actuarial terminology, so that non-actuaries familiar with business terminology may **understand** them. For example, the standards refer to “policy liabilities” rather than to “reserves” because, in financial reporting, “reserve” means an appropriation of surplus rather than a liability.

1130 JUDGMENT

- .01 *The actuary should exercise reasonable judgment in applying the standards. A judgment is reasonable if it is objective and takes account of*
- the spirit and intent of the standards,*
 - the Institute's Guiding Principle No. 1,*
 - the rules,*
 - common sense, and*
 - constraints on time and resources. [Effective December 1, 2002]*

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Need for judgment

- .02 While the standards are drafted so that they are, as much as possible, understandable by lay persons, the judgment of the actuary is necessary for their application.
- .03 The need for judgment is so pervasive that its continual mention is impractical, and so is understood in the drafting. Here are three examples of how recommendations are drafted and how they are to be understood:

Drafted: “*Deviation from a particular recommendation or other guidance in the standards is accepted actuarial practice if the effect of doing so is not material.*”

Understood: “*Deviation from a particular recommendation or other guidance in the standards is accepted actuarial practice if, **in the actuary's judgment**, the effect of doing so is not material.*”

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Drafted: “*The actuary may use and take responsibility for the work of another person if such actions are justified.*”

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Understood: “*The actuary may use and take responsibility for the work of another person if **the actuary is reasonably satisfied that** such actions are justified.*”

Drafted: “*When working with respect to an entity, the actuary should have knowledge of the circumstances of the case which is needed for the work.*”

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Understood: “*When working with respect to an entity, the actuary should have **reasonable** knowledge of the circumstances of the case which is needed for the work.*”

- .04 The exercise of judgment is not clear cut, except perhaps in hindsight. A judgment which is reasonable at its making is not made unreasonable by later hindsight.
- .05 A judgment which is completely subjective would not be reasonable even though it may be based on honest belief. A reasonable judgment would be objective and demonstrably take account of the criteria listed in the recommendation and discussed below.

Spirit and intent

- .06 An actuary who has a question about the standards in a particular case can sometimes answer the question by

considering the Institute's Guiding Principle No. 1 ("In carrying on its activities and programs, the Institute holds the duty of the profession to the public above the needs of the profession and its members"),

considering the rules, especially Rule 1 ("A member shall act honestly, with integrity and competence, and in a manner to fulfil the profession's responsibility to the public and to uphold the reputation of the actuarial profession."), and

posing the question, "If I had to defend my work to my peers, could I persuade them that I had sound reasons underlying my judgment?"

- .07 An actuary who has a question about the standards in a particular case may also consult in confidence with the chairperson or vice-chairperson of the appropriate practice committee, of the Practice Standards Council, or of the Committee on Rules of Professional Conduct. Rule 13 does not apply to such consultation.

- .08 An actuary who has a question about the spirit and intent of the standards in a particular case may also consult another actuary. It is expected that the other actuary will, as a professional courtesy, offer reasonable assistance. Rule 13 applies to such consultation.

Guiding Principle No. 1, rules, and common sense

- .09 A strained interpretation of a rule or recommendation is inappropriate.
- .10 An outlandish result or a seeming impossibility of applying the standards would indicate either a misinterpretation of the standards or their inapplicability to the situation.
- .11 Certain recommendations call for the actuary to obtain information relevant to the circumstances of the case; for example: see sections 1450, 1520, and 1730.06.
- .12 The actuary would conform to the "integrity", and "skill and care" requirements of Rule 1 by making a reasonable effort to obtain that information. The actuary is not responsible if that effort fails because the information is obscure or is withheld.

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Constraint on time and resources

- .13 The standards describe the theoretical ideal. In practice, however, the actuary's work is constrained by available time and resources. The actuary would therefore strive for an interpretation and application of the standards which strikes a reasonable balance between the theory and the constraints. The actuary has two powerful tools in so doing: materiality and approximation.

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1200 APPLICATION

1210 ACCEPTED ACTUARIAL PRACTICE

- .01 *The actuary should conform to accepted actuarial practice except when it conflicts with law or the terms of an appropriate engagement. A user of the actuary's work may assume that it is in accordance with accepted actuarial practice except when the actuary reports otherwise.* [Effective December 1, 2002]
- .02 The rules and the standards are the only explicit articulation of accepted actuarial practice. Explanation, examples, and other useful guidance may also be found in
- new standards, not yet effective but whose early implementation is appropriate,
 - educational notes,
 - actuarial principles,
 - exposure drafts,
 - historical records, and
 - Canadian and international actuarial literature.
- .03 Their applicability and their relative importance in a particular case is a matter for judgment, but the rules are the Institute's highest order of guidance,
- deviation from the rules is professional misconduct, and
- there is a presumption that a deviation from a recommendation is a breach of accepted actuarial practice, so that the onus for justification of that deviation is on the actuary.
- .04 Accepted actuarial practice is sometimes called "generally accepted actuarial practice" (for example, in the federal *Insurance Companies Act*) or "generally accepted actuarial principles".
- .05 The actuary usually reports having done his or her work in accordance with accepted actuarial practice, which is the norm and which, in the absence of disclosure of a deviation, is the expectation of users of actuaries' work. The permitted deviations are for conflict with law and with the terms of an appropriate engagement.

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1220 EDUCATIONAL NOTES

- .01 *The actuary should be familiar with relevant educational notes and other designated educational material.* [Effective December 1, 2002]
- .02 Educational notes and other designated educational material describe but do not recommend practice in illustrative situations.
- .03 A practice which the notes describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation.
- .04 The educational notes are intended to illustrate the application (but not necessarily the only application) of the standards, so there should be no conflict between them. By comparison, research papers and task force reports may or may not be in compliance with the standards. In any case, the educational notes are not binding.

1230 SCOPE

- .01 *The standards apply to work in Canada.*
- .02 *The application of any recommendations beyond their scope should take account of relevant circumstances.* [Effective December 1, 2002]

Work in Canada vs. work in another country

- .03 The distinction between work in Canada and work in another country depends primarily on the ultimate purpose of the work. It does not depend on where the actuary lives or where the actuary happens to be when doing the work.
- .04 Work in compliance with the laws or customs of a country or a particular region within that country is work in that country. Here are examples for financial reporting, taxation, and litigation:

If the work relates to financial reporting in accordance with U.S. generally accepted accounting principles, then the work is work in the U.S.A. Thus, a valuation of the liabilities of a pension plan of a Canadian subsidiary of a U.S. multinational for the consolidated financial statements of the multinational is work in the U.S.A.

If the work relates to taxation under the U.S. *Internal Revenue Code*, then the work is work in the U.S.A. Thus, a valuation of the policy liabilities of the U.S. branch of a Canadian insurer for the insurer's U.S. income tax return is work in the U.S.A.

If the work relates to litigation under U.S. law before a U.S. court, then the work is work in the U.S.A. Thus, a report to the lawyer of a Canadian defendant insured by a Canadian insurer on a claim for damages litigated under U.S. law in a U.S. court is work in the U.S.A.

.05 There may be cases when the distinction is not clear; for example, advice to a Canadian insurer on products to be sold outside Canada. In some of those cases, accepted actuarial practice may be the same in both countries, so the distinction does not matter. If the distinction matters, the actuary would, if practical, agree with the user and report on the appropriate practice and, failing agreement, would report the implications of the distinction.

Work outside Canada

.06 The best guidance for work in another country is the formal guidance, analogous to the rules and standards, which the actuarial profession in that country gives to its members. An example is the *Manual of Actuarial Practice* of the Faculty of Actuaries and the Institute of Actuaries in the United Kingdom. If that guidance does not exist or is limited, then these standards may provide useful guidance. The general standards are more likely to provide useful guidance than the practice-specific standards: in either case, however, the actuary would take account of differences between the laws and customs of the other country and those of Canada.

.07 In some cases, the applicability of foreign guidance to Institute members is formal. The Institute has reciprocal agreements with its counterpart professional organizations in certain other countries under which the Institute deems the formal guidance which the counterpart gives to its members to be applicable to Fellow(s), Associate(s) and Affiliate(s) of the Canadian Institute of Actuaries for work in that country. One of the purposes of the International Actuarial Association is to promote such reciprocal agreements.

.08 For example, for work in the U.S.A., Fellows, Associates and Affiliates of the Canadian Institute of Actuaries are bound by

the Code of Professional Conduct of the American Academy of Actuaries,

the Actuarial Standards of Practice and the Actuarial Practice Guidelines of the Actuarial Standards Board, and

the Qualification Standards of the American Academy of Actuaries.

Extension of scope

.09 The standards applicable to a particular situation do not necessarily provide useful guidance in a second, similar situation for which there are no standards. If they do provide useful guidance in the second situation, then the actuary would consider what modification is necessary in order to take account of the difference between the two situations.

.10 If the standards for the first situation are silent about the second situation, and if the actuary's work in the second situation is in accordance with those standards, appropriately modified, then the actuary would so report. If the standards for the first situation specifically exclude the second situation from their scope, and if it is, either by coincidence or convenience, appropriate for the actuary's work in the second situation to be in accordance with a modification of those standards, then the actuary would report the work without reference to those standards.

- .11 For example, consider the practice-specific standards which apply to the work of the appointed actuary of an insurer:

They include standards for valuation of the insurer's policy liabilities. There are no comparable standards if the insurer has no appointed actuary. An actuary may value that insurer's policy liabilities in accordance with the standards applicable to an appointed actuary to the extent permitted by legislation and would so report.

They also include standards for reporting an adverse condition which requires rectification. The standards explicitly exclude an actuary of an insurer who is not an appointed actuary from their scope because that actuary would not have the necessary authority and legal immunity. Extension of the scope of those standards would not be appropriate.

- .12 Application of standards to work outside Canada is always an application beyond their scope, as the standards apply only to work in Canada, but may be appropriate when the local profession provides no guidance.
- .13 Extension of the scope of the general standards is more likely to be appropriate than extension of the scope of the practice-specific standards.

1240 ASSOCIATES

- .01 “Associate” means a student enrolled pursuant to Section 5 of the Institute’s Bylaws.
- .02 The Institute does not expect an Associate to take responsibility for work. An Associate doing so, however, is as accountable as an actuary for that work and may not plead limited qualification or inexperience as an extenuating circumstance for a breach of accepted actuarial practice. The standards therefore apply to that Associate, with “Associate” substituted for “actuary”, but without any implication that the Associate **is** an actuary.

1300 PERMITTED DEVIATIONS

1310 CONFLICT WITH LAW

.01 *If accepted actuarial practice conflicts with the law, then the actuary should comply with the law, but should report the conflict and, if practical and useful, report the result of applying accepted actuarial practice. [Effective December 1, 2002]*

.02 On occasion, accepted actuarial practice may conflict with applicable law, in which case the law governs. For example:

The amount required to fund a registered pension plan may exceed the amount which the *Income Tax Act* permits a contributor to contribute.

Regulation may preclude the use of present values in valuing an insurer's policy liabilities.

.03 If the law merely requires a practice, or limits practice to a range, which is within the range of accepted actuarial practice, then accepted actuarial practice does not conflict with the law.

.04 If accepted actuarial practice conflicts with a practice which the law permits, but does not require, and if the terms of the actuary's engagement call for that practice, then the actuary would be guided by the recommendation in subsection 1320, Conflict with terms of engagement.

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.05 Description of the conflict and disclosure of its effect is useful in order

to disclose that the work deviates from accepted actuarial practice,

to disclose that the work, insofar as the conflict is concerned, is in accordance with the requirements of the legislator or regulator, which vary by jurisdiction, rather than accepted actuarial practice, which is uniform across Canada, and

to promote eventual adoption of accepted actuarial practice into law.

.06 The actuary may report the result of applying accepted actuarial practice either qualitatively or quantitatively. A quantitative report provides better information but requires more work.

.07 It is practical to report the result of applying accepted actuarial practice unless the work to do so is onerous or the needed data are unobtainable. If a quantified result is not practical, then a verbal description of the result is better than no report.

.08 The usefulness of reporting the result may vary among users. The criterion of usefulness is therefore usefulness to any user.

1320 CONFLICT WITH TERMS OF ENGAGEMENT

- .01 *If accepted actuarial practice conflicts with the terms of an appropriate engagement, then the actuary may comply with the terms of that engagement, but should report the conflict and, if practical and useful, report the result of applying accepted actuarial practice. [Effective December 1, 2002]*
- .02 The recommendation permits no deviation from the rules but may permit deviation from a particular recommendation or other guidance in the standards.
- .03 Usually, the actuary is responsible for all aspects of his or her work and performs it in accordance with accepted actuarial practice. The engagement to which the recommendation applies is usually one in which one or more aspects of work are omitted or are stipulated by the client or employer or the terms of a benefits plan. Here are examples of such an engagement:
- The actuary uses, but does not take responsibility for, the data, the software system, or the work, of the staff of the client or employer. 1610
- The client or employer or the terms of a benefits plan stipulates a method or an assumption which is not in accordance with accepted actuarial practice. 1730
- .04 Conflict between accepted actuarial practice and the law is not the same as conflict between accepted actuarial practice and the terms of an engagement. In the case of conflict with law, the actuary has no discretion: the law calls for a report by an actuary and stipulates the performance of one or more aspects of the needed work. In the case of an engagement whose terms call for deviation from accepted actuarial practice, the actuary has discretion to accept or not to accept the engagement. 1310
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- .05 The practicality and usefulness of reporting a result in accordance with accepted actuarial practice are the same as for subsection 1310, conflict with law. 1310

1330 UNUSUAL AND UNFORESEEN SITUATIONS

- .01 *Deviation from a particular recommendation or other guidance in the standards is accepted actuarial practice for an unusual or unforeseen situation for which the standards are inappropriate. The actuary should disclose, in confidence, that situation to the chairperson or vice-chairperson of the appropriate practice committee, or of the Practice Standards Council, or of the Committee on Rules of Professional Conduct. [Effective December 1, 2002]*
- .02 An unusual or unforeseen situation is rare and would arise because it is neither practical nor useful to anticipate every situation when drafting the standards. Disclosure of such a situation gives the Institute an opportunity to decide whether the standards need to be revised to cater to it, which results in better standards, or whether the situation is so exceptional that the standards cannot reasonably be expected to cater to it. The purpose of the recommended disclosure is not to decide if the actuary's conduct was in accordance with accepted actuarial practice. The actuary may therefore make that disclosure in confidence, either before or after the event. It is not appropriate for the actuary to limit that disclosure to a report which the Institute may not see.

- .03 Accepted actuarial practice evolves. The standards are not intended to inhibit research and discussion which contribute to that evolution. In an unusual or unforeseen situation, they may produce an inappropriate result and are therefore no substitute for sound judgment.
- .04 Rule 13 does not apply to the disclosure.
- .05 Usually, the actuary would report without reservation when deviating from a particular recommendation or other guidance in the standards in accordance with this subsection 1330, but it may sometimes be appropriate to describe and justify the deviation in the report.

1340 MATERIALITY

- .01 *Deviation from a particular recommendation or other guidance in the standards is accepted actuarial practice if the effect of so doing is not material.* [Effective December 1, 2002]
- .02 Judgment about materiality pervades virtually all work and affects the application of nearly all standards. The words “materiality” and “material” seldom appear in the standards, but are understood throughout them. For example, the recommendation that approximation is appropriate if it does not affect the result means that it does not **materially** affect the result.
- .03 “Material” has its ordinary meaning, but judged from the point of view of a user, having regard for the purpose of the work. Thus, an omission, understatement, or overstatement is material if the actuary expects it materially to affect either the user’s decision making or the user’s reasonable expectations. Usually, however, the user does not specify a standard of materiality, so the judgment falls to the actuary. That judgment may be difficult for one or more of these reasons:

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The standard of materiality depends on how the user uses the actuary’s work, which the actuary may be unable to foresee. If practical, the actuary would discuss the standard of materiality with the user. Alternatively, the actuary would report the purpose of the work as precisely as possible, so that the user is warned of the risk of using the work for a different purpose with a more rigorous standard of materiality.

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The standard of materiality may vary among users. The actuary would choose the most rigorous standard of materiality among the users.

The standard of materiality may vary among uses. For example, the same accounting calculations may be used for a pension plan’s financial statements and the financial statements of its participating employer. The actuary would choose the more rigorous standard of materiality between those two uses.

The standard of materiality depends on the user’s reasonable expectations, consistent with the purpose of the work. For example, advice on winding-up a pension plan may affect each participant’s share of its assets, so there is a conflict between equity and practicality. Similarly for advice on a policyholder dividend scale.

.04 The standard of materiality also depends on the work and the entity which is the subject of that work. For example:

A given dollar standard of materiality is more rigorous for a large than for a small entity.

The standard of materiality for valuation of an insurer's policy liabilities is usually more rigorous for those in its financial statements than for those in a forecast in dynamic capital adequacy testing.

The standard of materiality for data is more rigorous for determining an individual benefit (such as in a pension plan wind-up) than for a valuation of a group benefits plan (such as a going concern valuation of a pension plan's liabilities).

The standard of materiality for work involving a threshold, such as a regulatory capital adequacy requirement calculation of an insurer or a statutory minimum or maximum funding level for a pension plan would become more rigorous as the entity approaches that threshold.

.05 The actuary would not report an immaterial deviation from a particular recommendation or other guidance in the standards except if doing so assists a user to decide if the standard of materiality is appropriate for that user.

.06 The recommendation applies to both calculation and reporting standards.

Calculation standards

.07 The result of applying a recommendation may differ immaterially from the result of a simpler practice requiring less time and expense. For example, the practice-specific recommendations for valuation of policy liabilities for term life insurance have little effect on an insurer whose volume of term life insurance is trivial. To ignore them in that situation is accepted actuarial practice if it helps the actuary to concentrate time and resources on material items.

.08 In considering materiality, it is not appropriate to net items which are reported separately. For example, if simple practices requiring less time and expense than those in the recommendations materially overstate the premium liabilities of a property and casualty insurer and materially understate its claim liabilities, but do not materially affect their sum, then the understatement and overstatement are each material if the two items are reported separately. In considering materiality, it is, however, appropriate to net components **within** a separately reported item. To continue the example, it would be appropriate to net the overstatement of premium liabilities with the understatement of claim liabilities if only the sum of the two (i.e., the policy liabilities) is reported.

- .09 The effect of using a simpler practice requiring less time and expense than those in the recommendations may be conservative or unconservative. Usually, the criterion of materiality is the same in both cases.

Reporting standards

- .10 The result of applying a recommendation may provide information which is not useful. For example, disclosure of a material change in the basis for valuing the liabilities with respect to a material class of a benefits plan's members is not useful if that class was trivial at the previous valuation. Also, description of immaterial provisions of a benefits plan is not useful. To ignore the recommendation is accepted actuarial practice in that situation.

1400 THE ENGAGEMENT

1410 ACCEPTING AND CONTINUING AN ENGAGEMENT

- .01 *In accepting an engagement, the actuary should*
- agree on its terms with the client or employer,*
- be satisfied that it is an appropriate engagement, and*
- have reasonable assurance of time, resources, information, access to officers and staff, access to documentation, and the right to communicate information, as may be necessary for the work.*
- .02 *The actuary should consider consultation with the predecessor actuary, if any, to determine if there is any professional reason not to accept the engagement. The predecessor actuary should cooperate with the actuary who seeks to determine if there is any professional reason not to accept the engagement.*
- .03 *In performing the engagement, if the actuary becomes aware of information which, if known beforehand, would have been an impediment to acceptance of the engagement, then the actuary should*
- renegotiate the engagement to remove the impediment,*
- discontinue the engagement, or*
- provided that the engagement continues to be an appropriate engagement, report the impediment and its implications. [Effective December 1, 2002]*

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Terms of the engagement

- .04 The likelihood that work is satisfactory to all users concerned is enhanced by a clear understanding between the actuary and the client or employer on the terms of the engagement. Detailed identification of the time and resources, especially if they are substantial, and of the information needed to be communicated to and by the actuary, especially if it is sensitive or confidential, will avoid misunderstanding.

Appropriateness of engagement

- .05 An appropriate engagement is one which does not impair the actuary's ability to conform to the rules and in particular Rules 1, 2, 5, and 6. An engagement which leads to deviation from any rule is not appropriate. An engagement which leads to deviation from a particular recommendation or other guidance in the standards and even to a deviation from accepted actuarial practice may be an appropriate engagement in the circumstances.

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.06 The following guidance is useful in judging if the engagement is an appropriate engagement:

An engagement is *prima facie* appropriate if there are practice-specific standards which apply to it, especially if it does not call for a deviation from accepted actuarial practice.

An engagement's appropriateness is not likely affected if the actuary's client or employer selects particular assumptions as part of the terms of the engagement and the report describes the assumption and identifies the source, or chooses a value for certain assumptions from within a range selected by the actuary.

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An engagement to report on alternative scenarios or "What if?" questions is appropriate, given appropriate disclosure.

An engagement is less likely to be appropriate if it denies reasonable opportunity for an external user to question the actuary about his or her report.

.07 An engagement may involve a duty of confidentiality which conflicts with a recommendation on disclosure in reporting. That engagement would be appropriate, however, and the duty of confidentiality would supersede (at least temporarily) the duty of disclosure, if

confidentiality is necessary for the legitimate business objective of the client or employer,

the extent of the information to be kept confidential is reasonable,

the length of time for which it is to be kept confidential is reasonable, and

the duty of confidentiality permits reasonable exceptions; for example, if the actuary is permitted to disclose the information to, and to discuss the engagement with, an auditor or a regulator.

.08 For example, the engagement may be appropriate if the actuary temporarily withholds knowledge of

a mistake which favours his or her client in the report of the actuary engaged by the other side in litigation;

the imminent closure of a participating employer's Canadian operations and the consequent job loss and winding-up of the plan in giving advice on its funding, but the actuary would consider the need for an early revaluation or wind-up valuation; or

an insurer's imminent acquisition by new shareholders who will alter its business plan in reporting in the insurer's financial statements, but the actuary would consider the implications of the new business plan in reporting to the insurer's directors on financial condition.

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- .09 That engagement would not be appropriate, however, if the information is to be kept confidential in order to conceal improper business conduct, or to withhold information from users of the actuary's work who may reasonably expect the actuary to report it to them.
- .10 Any duty of confidentiality would give way to a duty of disclosure if disclosure is required by law, or if disclosure is required in order to comply with the bylaws or rules.
- .11 Whether an engagement is appropriate depends on the actuary as well as on the engagement. For example, an actuary would be in breach of the rules by accepting an engagement
- to be an insurer's appointed actuary without having the requisite special qualifications, experience, and knowledge, or
- which involves a conflict of interest which falls outside of the permitted scope of Rule 5.

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Subsequent information

- .12 While performing the engagement, the actuary may become aware of information which, if known beforehand, would have been an impediment to acceptance of the engagement. For example:
- The actuary's understanding of the engagement differs from that of the client or employer.
- The data are not sufficient or not reliable and cannot be remedied.
- Promised resources are not forthcoming and a substitute for them is not practical.
- .13 Renegotiation which removes the impediment would usually be the preferred alternative. Discontinuance would be the only alternative if the new information reveals the engagement not to be appropriate and renegotiation to make it so is impractical, which would be the case, for example, if an appointed actuary is denied access to needed information.
- .14 Failing renegotiation or discontinuance, the actuary would deal with the impediment by reporting it and its implications. Description of the implications would include both qualitative and quantitative aspects and their effect on the actuary's opinion.

1410.04

1420 FINANCIAL INTEREST OF THE ACTUARY

- .01 *The financial interest of the actuary should not influence the result of the actuary's work.* [Effective December 1, 2002]
- .02 The actuary's compensation for work may be fixed or may involve an incentive which is related to the result of the work. Examples of incentives are contingent fees and performance-related bonuses. Fixed compensation or an incentive which is related to efficient or timely performance of the work is not considered as compensation which would influence the result of the actuary's work. This subsection 1420 would apply if the compensation depended on the result of the work; for example, a bonus based on an insurer's net income when the work is to value the insurer's policy liabilities; in that case, the actuary has a financial interest in the result of the work but would not permit that interest to affect the result. On the other hand, it is not inappropriate for the actuary's client in litigation to call on the actuary for calculations based on assumptions which favour its side of the litigation, given an appropriate engagement and given appropriate disclosure in the actuary's report.
- .03 In some cases, it is useful to report the financial interest of the actuary in the result of the work. The practice-specific standards deal with those cases.

1430 FINANCIAL INTEREST OF THE CLIENT OR EMPLOYER

- .01 *The financial interest of the actuary's client or employer should not influence the result of the actuary's work except to the extent that the client or employer selects methods or assumptions for the work.* [Effective December 1, 2002]
- .02 The actuary's client or employer may have a financial interest in the result of the actuary's work. For example, it may be to the client's or employer's interest to maximize or minimize the result. That is usually the case when the actuary's client is one side of opposing interests; for example, the plaintiff or defendant in litigation, the purchaser or vendor in a sale, and the employer or union in labour negotiations.
- .03 In such a case, the actuary's duty of professionalism supersedes the duty of service to the client or employer.
- .04 In giving advice to a participating employer regarding the funding of a benefits plan, the actuary may first calculate a range, at any point of which funding would be appropriate. That range is the crux of the work, so a participating employer's financial interest would not influence its calculation. It is, however, appropriate and usually desirable for the actuary to consult the participating employer in the selection of the recommended funding within the range. The participating employer's financial interest – for example the participating employer's tolerance of fluctuation in the recommended rate of funding between one funding period and the next – would be taken into account in that consultation.

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- .05 Note, however, that the recommendation does not preclude the actuary's use of methods or assumptions selected by the client or employer in an appropriate engagement, but the actuary would report such use. 1410.05
1820.09
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- .06 Note also that the **purpose** of the work will influence the actuary's selection of methods and assumptions. The financial interest of the client or employer may shape the purpose of the work if the engagement is an appropriate engagement and the purpose is reported. 1410.05
1820.12

1440 GENERAL KNOWLEDGE

- .01 *The actuary should have adequate knowledge of the conditions in the practice area in which he or she is working.* [Effective December 1, 2002]
- .02 The relevant conditions may include legislation, accounting, taxation, the financial markets, family law, and court practices. The relevant legislation depends on the engagement, and may include legislation governing securities, pensions, insurance, workers' compensation, and employment standards.

1450 KNOWLEDGE OF THE CIRCUMSTANCES OF THE CASE

- .01 *The actuary should have adequate knowledge of the circumstances of the case on which he or she is working.* [Effective December 1, 2002] 1130.03
1130.12
- .02 The relevant knowledge for a corporate entity or benefits plan is that of the operations of the entity itself and may include that of the industry in which the entity operates. Usually, the entity is the actuary's client or employer but may be a proposed acquisition or merger partner of the client or employer.
- .03 In the case of a benefits plan, the entity is the plan itself, but, depending on the engagement, knowledge of the business conditions of the participating employer(s) may also be relevant.
- .04 The relevant knowledge for calculation with respect to an individual is the demographics of the individual and the context of the calculation.
- .05 Additional conservatism in making a calculation is not a substitute for knowledge of the circumstances of the case.

1500 THE WORK

1510 APPROXIMATION

- .01 *An approximation is appropriate if it reduces the cost of, reduces the time needed for, or improves the actuary's control over, work without affecting the result.* 1340.02
- .02 *If the actuary reports an appropriate approximation, then the report should avoid unintended reservation.*
- .03 *If the appropriateness of an approximation is doubtful, then the actuary should report its use with reservation. [Effective December 1, 2002]*
- .04 Like materiality, to which it is related, approximation pervades virtually all work and affects the application of nearly all standards. The words “approximation” and “approximate” seldom appear in the standards, but are understood throughout them.
- .05 Approximation permits the actuary to strike a balance between the benefit of precision and the effort of arriving at it.

Approximation in selection of a model

- .06 Reality is complex. A simple model reduces not only the time and expense of work but also the risk of calculation and data error. 1710.05
- .07 The appropriateness of a simplification depends on the circumstances of the case and the purpose of the work. For example, in selecting a model for advice on funding a pension plan, it may be appropriate to allow for indexing by modifying the assumption for a contingency of which the model takes account, such as the investment return assumption, to arrive at a suitable composite assumption.

Approximation in the selection of assumptions

- .08 Simplification of an assumption may be an appropriate approximation. For example:

Deaths occur continuously over a year: for simplicity, assume that they all occur at the middle of the year.

Members of a pension plan with early retirement reductions that approximate full actuarial reductions retire at various rates between, say, ages 55 and 65; for simplicity, assume that they all retire at, say, age 62.

If the members of a pension plan who die before retirement are entitled to a benefit which is roughly the same as the present value of the retirement benefit: for simplicity, assume that death rates before retirement are equal to zero.

- .09 To make no assumption about a contingency is usually tantamount to assuming a zero rate for that contingency, which is rarely appropriate in itself, but may be appropriate when combined with an adjustment to a related assumption. For example:

The calculation of the liabilities in a benefits plan using an explicit expense assumption may be approximated by calculating the liabilities without an explicit expense assumption and using a lower liability discount rate assumption than otherwise appropriate.

Approximation by sampling

- .10 A well-chosen sample avoids the extra work of an examination of the entire universe.

Approximations respecting data

- .11 Data may be defective. For example, a benefit plan's records may lack the date of birth of certain members. In some cases there is an appropriate approximation; for example, sampling, or extrapolation from similar situations for which data are available.

Approximation vs. assumption

- .12 A criterion of the appropriateness of an approximation is its effect on the result. If the actuary approximates but is unable to assess the resulting error, then the approximation becomes, in effect, an assumption. For example, data are missing and it is not practical to get them. The actuary would consider whether their lack is so important that a report with reservation is necessary but in any case is obliged to make an assumption about them in order to do the work.

Reporting approximations

- .13 To report appropriate approximations in a longer report may provide information useful to users, but such reporting would avoid unintended reservation, as the use of approximations is a usual part of work. The pervasiveness of approximations in work makes their complete reporting impractical.
- .14 If the actuary reports an implicit assumption used as an approximation, then he or she would also report the corresponding explicit assumption or assumptions. Similarly, if an actuary reports approximations for two offsetting assumptions which results in the same net effect as the underlying explicit assumptions, the actuary would also report the explicit assumptions.
- .15 The actuary would not usually use an approximation whose appropriateness is doubtful. That may be unavoidable, however, if data are insufficient or unreliable or if needed resources are lacking. If the engagement is an appropriate engagement, then the actuary would report with reservation the use of the approximation, so that a user is aware of a limitation to the actuary's work.

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1520 SUBSEQUENT EVENTS

- .01 *The actuary should correct any data defect or calculation error which a subsequent event reveals.*
- .02 *For work with respect to an entity, the actuary should take a subsequent event into account (other than in a pro forma calculation) if the subsequent event* 1520.04
- provides information about the entity as it was at the calculation date,* 1520.07
- retroactively makes the entity a different entity at the calculation date, or* 1520.10
- makes the entity a different entity after the calculation date and a purpose of the work is to report on the entity as it will be as a result of the event.* 1520.13
1520.16
- .03 *The actuary should not take the subsequent event into account if it makes the entity a different entity after the calculation date and a purpose of the work is to report on the entity as it was at the calculation date, but the actuary should report that event. [Effective December 1, 2002]* 1520.13
1520.16

Classification

- .04 *A subsequent event is relevant to the recommendation if it reveals an error, provides information about the entity, or is a decision which changes the entity.*
- .05 *The actuary would correct an error revealed by a subsequent event. The actuary would classify each subsequent event other than those which reveal errors and, depending on the classification, the actuary would either*
- take that event into account, or*
- report that event, but not take it into account.*

Definitive and virtually definitive decisions

- .06 *A definitive decision means a final and permanent decision which is not tentative, provisional, or unsettled. It would be evidenced by an amendment to a benefits plan, a collective bargaining agreement, a binding exchange of letters between two contracting parties, a court order, a legislative bill which has been proclaimed, or the like. A virtually definitive decision is one which is virtually certain to become definitive, but which lacks one or more formalities like ratification, due diligence, regulatory approval, third reading, royal assent, or proclamation. However, a decision which still involves discretion at an executive or administrative level is not virtually definitive.*

Event provides information about entity as it was

.07 Examples of a subsequent event that provides information about an entity as it was at the calculation date are

publication of an experience study which provides information for selection of assumptions,

reporting to an insurer of a claim incurred on or before the balance sheet date, and

adoption of a pension plan amendment that takes effect prior to the calculation date.

.08 In such a case, the effect of the subsequent event on the work is the same as if it had occurred on or before the calculation date.

.09 The actuary would not report the event as being a subsequent event. That is, the actuary would report it only if its importance as an event, whether subsequent or not, warrants reporting.

Event retroactively makes entity different

.10 Examples of events that retroactively make the entity different at the calculation date are definitive or virtually definitive decisions, made after the calculation date, but effective on or before the calculation date

to wind-up a pension plan partially or fully,

to sell a portion of a participating employer's business and consequently to spin-off the corresponding members from the participating employer's pension plan,

to lay off employees who are members of a pension plan,

to report to an insurer a claim incurred after the calculation date,

to amend the benefits of a pension plan, or

to transfer a portion of an insurer's policies to another insurer.

.11 In such a case, the effect of the subsequent event on the work is the same as if it had occurred on or before the calculation date.

.12 The actuary would not report the event as being a subsequent event. That is, the actuary would report it only if its importance as an event, whether subsequent or not, warrants reporting.

Event makes entity different after

.13 If the subsequent event makes the entity a different entity after the calculation date, then the purpose of the work determines whether or not the actuary takes the event into account.

- .14 If the subsequent event makes the entity a different entity after the calculation date and the purpose of the work is to report on the entity as it will be as a result of the event, then the actuary would take that event into account and would describe it in reporting.
- .15 If the subsequent event makes the entity a different entity after the calculation date and the purpose of the work is to report on the entity as it was at that date, then the actuary would not take that event into account but would report the event since it would affect the entity's future operations and the actuary's subsequent calculations.

Classification not clear

- .16 The classification of a subsequent event may be unclear, at least *a priori*, although the circumstances of the case and the actuary's engagement may make it clear. Examples of such events are:

A precipitous fall in the stock market. For financial reporting, one can argue that the stock market crash provides additional information about the entity as it was at the calculation date, because the crash is an indicator of the outlook for common share investments at that date; alternatively, one can argue that the crash makes the entity a different entity only after the calculation date as it creates a new situation. The new situation would be reflected in the financial statements for the subsequent accounting period.

A salary freeze for employees who are members of a pension plan. If the salary freeze is a correction of excessive salaries, then it provides additional information about the entity as it was at the calculation date, because the freeze is an indicator of the outlook for salaries at the calculation date. If the salary freeze deals with a recent problem, then it indicates a change in conditions which makes the entity a different entity after the calculation date. In either case, the actuary would consider the effect of the freeze on the employees' pension benefits. It may be that the freeze will have a lasting effect. Alternatively, it may be that the freeze will be compensated for by higher salaries later on, so that the salary inflation assumption based on historical trends continues to be valid.

Default on a bond. If the default was the culmination of a gradual deterioration in its issuer's financial condition, most of which had occurred before the calculation date but which was not apparent until revealed by the default, then the default provides additional information about the entity as it was at the calculation date. If the default was precipitated by a catastrophe, then it provides information about a change in conditions which makes the entity a different entity after the calculation date.

Insolvency of an insurer's reinsurer. This is similar to default on a bond. If the insolvency was the culmination of a gradual deterioration in the reinsurer's financial condition, most of which had occurred before the calculation date but which was not apparent until revealed by the insolvency, then the insolvency provides information about the entity as it was at the calculation date. If the insolvency was precipitated by a catastrophe, then it provides information about a change in conditions which makes the entity a different entity after the calculation date.

- .17 The following table may assist in determining when a subsequent event does or does not take place and what action to take:

When does actuary first become aware of event?	When did event occur?	How does event change entity?	What is the purpose of the work?	Suggested action
Before <u>calculation date</u>	N/A	N/A	N/A	Treat as other information
After <u>report date</u>	N/A	N/A	N/A	Include in subsequent <u>report</u> and/or withdraw or amend <u>report</u>
After <u>calculation date</u> and before <u>report date</u> (a <u>subsequent event</u>)	Before <u>calculation date</u>	N/A	N/A	Treat as if knowledge obtained before <u>calculation date</u>
	After <u>calculation date</u>	Entity became different as of or prior to <u>calculation date</u>	N/A	Take event into account as if it occurred prior to <u>calculation date</u>
		Entity becomes different after <u>calculation date</u>	Report on entity as it was at <u>calculation date</u>	Report event but do not take into account in calculations
			Report on entity as it will be after <u>calculation date</u>	Report event and take into account in calculations
Unclear		N/A	Gather more information until classification is clear	

1820.33

Reporting

- .18 Sometimes it is practical and useful to report an alternative and opposite calculation; i.e., an alternative calculation which does not so take the subsequent event into account when the main calculation does, or which takes the event into account when the main calculation does not. (For example, in a province for which the calculation date for a pension valuation following marriage breakdown is the date of separation, the plan member has elected at some time between the calculation date and the report date to retire with an early retirement penalty. The actuary would consider reporting values assuming that this subsequent event had been an established intention at the calculation date, instead of or in addition to retirement scenarios otherwise recommended in the practice-specific standards.) In those cases, the actuary makes the same calculations regardless of the purpose of the work but their reporting depends on the purpose of the work.

1530 DATA

.01 *If the actuary reports without reservation with respect to data, then the data should be sufficient and reliable for the work. If sufficient and reliable data are unobtainable but the defect in them does not negate the usefulness of the result, then the actuary should report a usual opinion with reservation in respect of data. If defect in the obtainable data precludes a useful result, then the actuary should so report or make no report.* [Effective December 1, 2002]

.02 The work with respect to data consists of

identifying the data needed,

attempting to obtain them,

reviewing the data obtained, and

assessing sufficiency and reliability of the data obtained.

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.03 If the actuary intends **not** to take responsibility for data, then the actuary would so report and would report any evident shortcomings in those data.

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.04 Examples of the usual practice are:

For a calculation of a pension value in a marriage breakdown, the actuary usually does not take responsibility for data, such as the demographics of the pensioner and the terms of the pension plan. The actuary would usually accept the data supplied by counsel and repeat it in reporting.

For advice in funding a pension plan, the actuary usually does not take responsibility for participant data and usually accepts, without taking responsibility for, the plan's financial statements and its investment data.

For calculating the policy liabilities of an insurer, the actuary usually takes responsibility for all data.

.05 If the data, while usable, are not sufficient and reliable and the actuary's efforts to make them so are unsuccessful, the actuary would not take responsibility for the data and would report with reservation, even when it is usual to take responsibility for them.

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Sufficiency and reliability

.06 Data are sufficient if they include the needed information for the work. For example, participants' dates of birth are needed to value the liabilities of a pension plan. Data are reliable if that information is accurate.

.07 The actuary would usually take responsibility for the sufficiency of the data. Whether the actuary takes responsibility for the reliability of the data depends on the engagement.

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- .08 If the ideal data are unobtainable at reasonable cost within the available time, then the actuary would consider what, if any, alternative data are sufficient and reliable.
- .09 Work usually is both data-dependent, meaning that the quality of the result depends on the sufficiency and reliability of the data, and data-intensive, meaning that the data are both voluminous and detailed.

Obtaining data

- .10 Usually, the actuary has neither custody of nor control over the data, and uses data supplied by other persons. Usually, therefore, after identifying the needed data and attempting to obtain them, the actuary's task is not data creation but data verification, either personally or by using the work of other persons.

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Reviewing data

- .11 Items to consider in reviewing data are
- the procedures for, the controls over, and the qualifications of the persons responsible for, their preparation and maintenance,
 - their internal consistency, their consistency with comparable prior period data, and their consistency with external comparable data, such as other files with common elements,
 - their consistency with the governing plan documents and policy forms, and
 - what, if any, independent confirmation is available.
- .12 If the user is able to verify the data, then the actuary may avoid verification by reporting the data. For example, in the case of an actuarial evidence report on the valuation of a disabled person's lost income, the reported data may be either agreed by the parties to the litigation or proved in court. Such avoidance of data verification is usually not practical when the work is data-intensive or has multiple users.

Assessing sufficiency and reliability of data

- .13 The actuary who takes responsibility for the data classifies them as one of the following:

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Sufficient and reliable, in which case the actuary reports an opinion without reservation on data. That does not imply that the data are perfect. Data are rarely perfect; especially when they are voluminous or complex.

Defective, but not so as to negate the usefulness of the result, in which case the actuary reports a usual opinion with reservation which describes the defect, describes the work done and assumptions made to cope with the defect, and, if practical, quantifies the effect of the defect on the result.

So defective as to preclude a useful result, in which case the actuary reports or makes no report. If a report is useful or legally required, then the actuary would describe the defect, describe the work done and assumptions made to cope with the defect, quantify if practical a result, and explain that an opinion is not given because it is not possible to estimate the effect of the defect on the result. If a report is neither useful nor legally required, then the actuary would make none.

1540 CONTROL

- .01 *Control procedures which prevent and detect error should accompany a calculation.* [Effective December 1, 2002]
- .02 A calculation which is data-intensive, which is complex, which involves physically separate steps like manual and data processing steps or parallel data processing steps, or – especially – a combination of them, is prone to error which appropriate control procedures may prevent or, failing prevention, detect. Appropriate control procedures also help to meet the need for consistency between the actuary's work and other related work; for example, a uniform cut-off date in the preparation of financial statements.
- .03 Examples of control procedures are procedures to assure that
- all steps in the calculation are co-ordinated,
 - all steps in the calculation have been performed and checked,
 - the actuary's data processing does not corrupt the data supplied to the actuary,
 - established procedures (for example, those for a prior period) are not changed inadvertently, and
 - changes in established procedures are made in an orderly manner.
- .04 Examples of control tools are
- random sampling,
 - spot checks, and
 - audit trails.

1550 REASONABLENESS OF RESULT

- .01 *The actuary should examine the reasonableness of a calculation's result.* [Effective December 1, 2002]
- .02 As a result of defective data, defective computer software, a cumulation of individually biased assumptions, or the like, a calculation, especially a complex one like a valuation or financial forecast, may be prone to error which checking of the calculation's **steps** does not reveal but which an examination of its **result** may reveal. Such an examination is therefore useful and prudent.
- .03 The examination would consider simple questions like:
- How does the result compare to the corresponding result for a prior period or a similar case, or to a related but independently determined amount? Comparison of a **benchmark** may be more meaningful than comparison of the **result**. Examples of a benchmark are the forecasted number of retirees divided by the forecasted number of active employees, the loss ratio implied by claim liabilities, and the change during the year of the result.
 - How does the result compare to the corresponding result of a rough approximation?
 - Does the result make common sense?
- .04 The answers to such questions may indicate a need for more work.

1560 DOCUMENTATION

- .01 *The actuary should use his or her best efforts to compile and secure the retention of appropriate documentation.*
- .02 *Where a successor actuary takes possession or control of documentation previously in the possession or control of a predecessor actuary, the successor actuary should use his or her best efforts to make such documentation available to the predecessor actuary, upon request by the predecessor actuary, if needed by the predecessor actuary to respond to queries about the related work.*
- .03 *Where a successor actuary or an employer or client, acting on behalf of a successor actuary, requests access to documentation in the possession or control of a predecessor actuary, in order to carry on work, the predecessor actuary should use his or her best efforts to comply with the request. [Effective December 1, 2002]*
- .04 Documentation is an integral part of work which affects the application of nearly all standards.
- .05 Documentation consists of letters of engagement, working papers, meeting notes, memoranda, correspondence, reports, copies or excerpts of company or plan data and documents, and work plans. Appropriate documentation describes the course of the work and the actuary's compliance with accepted actuarial practice.
- .06 Both professional and legal needs may affect the length of time during which documentation is to be retained.
- .07 An actuary who severs connection with a client or employer (for example, an actuary who retires or changes job) may seek to secure the retention of documentation of work for that client or employer by entrusting it to another actuary, who may be the successor actuary. Said other actuary would use his or her best efforts to make the documentation available to the predecessor actuary if his or her work is questioned or challenged.
- .08 In some circumstances, documentation may not be in the possession or control of an actuary, or an actuary may be unable to release the documentation, particularly in cases involving the proprietary interests of a third party (including a client or employer). In the face of such difficulties, the actuary would seek further advice.

1840

1600 ANOTHER PERSON'S WORK

1610 ACTUARY'S USE OF ANOTHER PERSON'S WORK

- .01 *The actuary may use and take responsibility for another person's work if such actions are justified.*
- .02 *If the actuary uses but does not take responsibility for another person's work, then the actuary should so report. [Effective December 1, 2002]*
- .03 Use of the work of other persons is a usual, indeed often inevitable, part of work. The actuary uses and takes responsibility for the work of colleagues and assistants; that use is usually straightforward because the actuary is able to assess the appropriateness of their work. Use of the work of outsiders raises questions. Is their work appropriate? Should the actuary take responsibility for it?
- .04 To take responsibility for another person's work requires more work of the actuary and may expose the actuary to risk of legal liability, but may give the user greater confidence that the other person's work is appropriate. The actuary would not take such responsibility if doing so constitutes unauthorized practice of the other person's profession, i.e., if doing so is in direct violation of statutes or laws governing who can practice the other person's profession, or would lead a reasonable person to believe that the actuary possessed and purported to exercise the skill and learning of a duly qualified professional in that other person's profession.
- .05 If the actuary does not take such responsibility, then the actuary reports with reservation and the user would seek alternative assurance that the other person's work is appropriate which may or may not be practical.
- .06 Whether or not the actuary takes responsibility for another person's work depends on the engagement and on the nature of the other person's work. Consider, for example, data supplied by another person:

If the terms of the engagement call for it, then the actuary would take responsibility for data, which means that the actuary would audit the data supplied by another person. The audit would be as intense as needed for the actuary to take as much responsibility for the data as he or she would take for the calculations. Such an audit is never a small task when the data are voluminous or complex.

In other cases, it may be satisfactory if the actuary accepts and does not take responsibility for the data supplied by another person. That course avoids expense and saves time. That course would be satisfactory to the actuary's client or employer who supplies the data and who is comfortable with its sufficiency and reliability. Whether that course is satisfactory to another user of the actuary's work depends on whether that user has other assurance that the supplied data are sufficient and reliable. The actuary would report with reservation so that the limitation of his or her responsibility is disclosed.

The supplier of the data would usually be comfortable with their sufficiency and reliability.

Even when the actuary is not taking responsibility for the data, however, he or she would not accept supplied data blindly, but would make checks of reasonableness, if only to assure that the data had lost nothing in the transmission and that the actuary's understanding of the data is the same as the supplier's.

Use and take responsibility

.07 As long as doing so does not constitute unauthorized practice of another person's profession, the actuary may use and take responsibility for another person's work, given confidence that such actions are justified as a result of

early and periodic communication with the other person,
confidence in the other person's qualifications, competence, integrity, and objectivity,
the other person's awareness of how the actuary intends to use the other person's work,
communication to the other person of any information known to the actuary which may affect the other person's work, and vice versa, and
study of any report by the other person and discussion of it with the other person, especially of any reservation in the report.

.08 Failing such confidence, the actuary would not take responsibility for the other person's work.

.09 The Institute encourages the actuary's use of auditor's work in accordance with the *Joint Policy Statement* of the Institute and the Canadian Institute of Chartered Accountants. The *Joint Policy Statement* also provides useful guidance if the actuary uses the work of a person other than an auditor.

1630

.10 In the case of use of another actuary's work,

identification of the differences between accepted actuarial practice in Canada and the practice which the other actuary followed if the other actuary worked outside of Canada, and

review of the other actuary's working papers

may also be helpful.

.11 The actuary would not usually report use of another person's work if the actuary takes responsibility for that work. To do so may imply a reservation. If it is useful, the actuary may report both the use of, and taking responsibility for, another person's work.

Use but not take responsibility

.12 If the actuary uses but does not take responsibility for another person's work, then the actuary would nevertheless examine the other person's work for evident shortcomings and would either report the results of such examination or avoid use of the work.

1620 AUDITOR'S USE OF AN ACTUARY'S WORK

.01 *The actuary should cooperate with an auditor who wishes to use the actuary's work in accordance with the Joint Policy Statement of the Institute and the Canadian Institute of Chartered Accountants. [Effective October 1, 2007]*

1630 CIA/CICA JOINT POLICY STATEMENT

The Canadian Institute of Actuaries and the Canadian Institute of Chartered Accountants agreed that each would incorporate the *Joint Policy Statement* in its standards of practice. Accordingly, the Joint Policy Statement is in the *CICA Handbook-Assurance* and in these standards of practice. Any change to the Agreement requires the consent of both Institutes. As a result, the style of this subsection differs somewhat from the style of the rest of the standards of practice.

JOINT POLICY STATEMENT

CONCERNING COMMUNICATIONS BETWEEN ACTUARIES

INVOLVED IN THE PREPARATION OF FINANCIAL STATEMENTS AND AUDITORS

This Joint Policy Statement effective October 1, 2007 has been approved by the Actuarial Standards Board of the Canadian Institute of Actuaries (CIA) and by the Auditing and Assurance Standards Board of The Canadian Institute of Chartered Accountants (CICA).

PURPOSE AND APPLICATION

- 1 The purpose of the Joint Policy Statement is to discuss:
 - a) communications between actuaries involved in the preparation of financial statements, and auditors, regarding their respective responsibilities;
 - b) how those actuaries and auditors would interact in carrying out their respective responsibilities; and
 - c) how their respective responsibilities may be disclosed to readers of financial statements.
- 2 This Statement applies when an auditor is engaged to carry out an audit of financial statements in accordance with generally accepted auditing standards where the financial statements prepared by management include amounts determined by or with the assistance of an actuary. This Statement also applies when an actuary considers the work of an auditor in connection with conducting the actuarial valuation to determine amounts to be included in the financial statements prepared by management. This statement does not apply to communications with an auditor's actuary or an external review actuary.
- 3 The financial statements of a pension plan or post-employment benefits plan and of the sponsor of such plans, and the financial statements of an insurance enterprise, are the best examples of when this Statement applies.

DEFINITIONS

4 For the purposes of this Statement:

- a) “actuary involved in the preparation of financial statements” means an actuary, either an employee of the company or an independent consultant, who determines and reports on amounts to be included in the financial statements prepared by management.
- b) “applicable professional standards” means:
 - i) when the responding professional is an actuary, the Standards of Practice and the Rules of Professional Conduct of the Canadian Institute of Actuaries; and
 - ii) when the responding professional is the auditor, the CICA Handbook-Assurance and the rules of professional conduct of the provincial Institute of which the auditor is a member.
- c) “auditor” means an auditor who has been appointed to perform an audit and report on financial statements or to perform specified procedures on data;
- d) “auditor’s actuary” means an appropriately qualified actuary who assists the auditor in assessing risk and performing further audit procedures to respond to assessed risk;
- e) “data” includes particulars of:
 - i) invested assets of a pension plan or post-employment benefits plan or an insurance enterprise,
 - ii) membership of a pension plan or post-employment benefits plan,
 - iii) policies of and claims against an insurance enterprise, and
 - iv) reinsurance of an insurance enterprise;
- f) “enquiring professional” means the actuary or the auditor, as the case may be, who is considering the work of the other;
- g) “external review actuary” means an actuary who reviews the work of another actuary at the request of a regulator and provides an opinion to the regulator as to whether the work meets applicable professional standards and accepted actuarial practice;
- h) “insurance enterprise” includes the following enterprises, including companies, branches, fraternal benefit societies and other forms of organizations:

- i) life insurance enterprises;
 - ii) property and casualty insurance enterprises;
 - iii) reinsurance enterprises; and
 - iv) workers' compensation enterprises.
- i) "management" refers to any person(s) having authority and responsibility for planning, directing and controlling the activities of an enterprise;
 - j) "responding professional" means the actuary or the auditor, as the case may be, whose work is being considered by the other.

RESPONSIBILITIES WITH RESPECT TO FINANCIAL STATEMENTS

- 5 The financial statements are the responsibility of management. The representations contained in the financial statements may include amounts determined by an actuary. In determining those amounts, the actuary is responsible for assessing the sufficiency and reliability of the data used in the valuation. The actuary may consider the work of an auditor with respect to data integrity and controls. In such cases, the actuary involved in the preparation of the financial statements acts as the enquiring professional and the auditor acts as the responding professional.
- 6 The auditor, on the other hand, has a responsibility to express an opinion on the fairness with which the financial statements present the financial position, results of operations and cash flows in accordance with the applicable financial reporting framework, which will normally be generally accepted accounting principles. When the financial statements include amounts determined by an actuary, the auditor considers the work of the actuary as part of the audit evidence supporting the actuarial valuation. In such cases, the auditor acts as the enquiring professional and the actuary involved in the preparation of the financial statements acts as the responding professional.

CONSIDERING THE RESPONDING PROFESSIONAL'S WORK

- 7 The enquiring professional may consider the work of the responding professional provided that the enquiring professional takes reasonable care to determine that there is a basis for such consideration. This is done by communicating with the responding professional to establish an understanding of the work to be carried out by each and by considering:
- a) the responding professional's appointment to do the work;
 - b) whether the responding professional has followed the standards of his or her profession in carrying out the work; and
 - c) the appropriateness of the responding professional's findings and opinion.

COMMUNICATION BETWEEN THE TWO PROFESSIONALS

- 8 Communication would be established between the auditor and the actuary involved in the preparation of the financial statements when planning their respective engagements, and further communication would take place as necessary throughout the engagement.
- 9 On a timely basis, each professional seeks from management the right to:
- a) communicate with the other professional; and
 - b) when necessary disclose any relevant information to the other professional.
- 10 The enquiring professional would:
- a) inform the responding professional of the intended consideration of his or her work in accordance with this Statement;
 - b) request confirmation from the responding professional that he or she has been engaged by the shareholders, policyholders, directors, or management to do the work that the enquiring professional intends to consider;
 - c) request confirmation from the responding professional that he or she is a professional in good standing;
 - d) request confirmation from the responding professional that he or she will carry out the work required in accordance with the applicable professional standards; and
 - e) make the responding professional aware of the enquiring professional's needs. This would include a discussion of:
 - i) the application of the concept of materiality to determine that the responding professional will be using a materiality level that is appropriate in relation to the enquiring professional's materiality level in accordance with applicable professional standards;
 - ii) subsequent events, to determine that the responding professional understands how they are to be treated and that he or she will consider the effect of matters that come to his or her attention up to the date of his or her report;
 - iii) the timing of the work to be carried out by the responding professional and the date of his or her report; and
 - iv) any questions relating to the responding professional's work.

- 11 The responding professional would provide a written response to the enquiring professional that would:
- a) confirm the expectation that he or she is available to perform the work that the enquiring professional intends to consider;
 - b) confirm that he or she has been engaged by the shareholders, policyholders, directors, or management to do the work that the enquiring professional intends to consider;
 - c) confirm that he or she is a professional in good standing;
 - d) confirm that he or she is qualified to perform the work that the enquiring professional intends to consider (including having the certifications or designations, if any, required for particular areas of practice) ;
 - e) confirm that this work will be carried out in accordance with the applicable professional standards;
 - f) confirm awareness of the enquiring professional's intended consideration of his or her work; and
 - g) discuss any problems expected in meeting the needs of the enquiring professional on a timely basis.

THE RESPONDING PROFESSIONAL'S QUALIFICATIONS, COMPETENCE, AND INTEGRITY

- 12 In the case of an auditor, prima facie evidence of professional qualification is membership in good standing in a provincial institute of accountants. In the case of an actuary, prima facie evidence of professional qualification is fellowship in good standing in the Canadian Institute of Actuaries.
- 13 When the responding professional is not well known to the enquiring professional, the enquiring professional may obtain assurance as to the responding professional's reputation for competence and integrity by consulting with others who are familiar with the responding professional's work.

THE RESPONDING PROFESSIONAL'S FINDINGS

- 14 The responding professional's written response to the enquiring professional after completion of the work would:
- a) identify the purpose of the work;
 - b) identify the financial statements or data to which it relates;
 - c) identify the responding professional's relationship to the entity to which the financial statements or data pertain;
 - d) confirm awareness that the enquiring professional intends to consider the work in accordance with this Statement; and
 - e) when appropriate, include a copy of the report provided to the party who employed or engaged the responding professional that sets out the findings and, when applicable, opinions of the responding professional, including a representation that the work was performed in accordance with the applicable professional standards.
- 15 When the enquiring professional has a question about an aspect of the responding professional's work, the question would be raised with the responding professional who would provide a reasonable explanation about that aspect of his or her work. This does not, however, limit the right of the enquiring professional to any information or explanation that may be required in the performance of his or her duties in accordance with the applicable professional standards.

DISCLOSURE OF RESPECTIVE RESPONSIBILITIES TO THE READERS OF FINANCIAL STATEMENTS

- 16 When required by law or regulation, a description of the respective responsibilities of the auditor and of the actuary involved in the preparation of the financial statements would accompany the financial statements.

1640 REVIEW OR REPEAT OF ANOTHER ACTUARY'S WORK

- .01 In this subsection 1640,
- “first actuary” means an actuary whose work is reviewed or repeated,
- “review engagement” means an engagement to review the first actuary’s work,
- “reviewer” means the actuary engaged to review or repeat the first actuary’s work, and
- “repeat engagement” means an engagement to repeat all or part of the first actuary’s work.
- .02 The standards in this subsection 1640 apply to a review engagement which is at the instigation of a user. They do not apply to quality control in the first actuary’s firm or employer (sometimes referred to as “internal peer review” or “internal audit”), even if the reviewer is external to the first actuary’s firm or employer. The standards for a review engagement also apply, *mutatis mutandis*, to a repeat engagement.
- .03 *If the terms of the first actuary’s engagement so permit, then the first actuary should cooperate with the reviewer.*
- .04 *If the terms of the review engagement so permit, then the reviewer should, as soon as practical, discuss the review with the first actuary (unless the reviewer’s agreement with the first actuary’s work makes such discussion superfluous), and should attempt to resolve any difference between them. The reviewer should report the result of such discussion.*
- .05 *If the reviewer reports disagreement with the first actuary’s work but that work is within the range of accepted actuarial practice, then the reviewer should so report.*
- .06 *If a limitation in time, information, data, or resources constrained the quality of the first actuary’s work, then the reviewer should so report.*
- .07 *If discussion between the two actuaries results in improvement to the first actuary’s work or, in the case of periodic reporting, to the work expected for the subsequent report, then the reviewer should so report.*
- .08 *If the first actuary’s work is not within the range of accepted actuarial practice, then the reviewer should so report and should consider Rule 13 (apparent material noncompliance with the rules or standards).*
- .09 *A repeat engagement is an appropriate engagement if its purpose is to identify or reduce uncertainty in the matter on which the first actuary reported. [Effective September 1, 2003]*

Applicable rules

- .10 The rules affect a review engagement, in particular Rule 1, on upholding the reputation of the profession; Rule 8, on dealing with other actuaries; and Rule 13, on apparent material noncompliance by another member with the rules or standards.

Selection of reviewer

- .11 The reviewer may be engaged by a user of the first actuary's work or by the first actuary. The latter may not be appropriate if the interests of that user and the first actuary's client or employer are opposed, but otherwise has the merit of
- facilitating compliance with this subsection 1640,
 - helping to assure selection of a qualified reviewer, and
 - avoiding unnecessary duplication by the reviewer of the first actuary's work.
- .12 In selecting a reviewer or agreeing the terms of the engagement, then the first actuary would have regard to the user's objective for the review and would consult with the user as appropriate.
- .13 If an actuary is qualified to perform the work of the first actuary, then that is *prima facie* evidence that the actuary is qualified to be the reviewer.
- .14 The perceived objectivity of the reviewer is enhanced if the reviewer is independent of the first actuary.

Terms of the engagement

- .15 The review may take place prior to the release of the first actuary's report ("pre-release review") or after such release ("post-release review"). A pre-release review provides the opportunity for the reviewer to suggest improvement to the work. A post-release review allows such improvement to be implemented only in future work and in some cases might require a withdrawal of the report and revision to the work. A post-release review would therefore be avoided unless the circumstances of the case require it.
- .16 It is desirable that the terms of the engagement permit timely open discussion between the two actuaries. Such discussion
- facilitates the review,
 - lessens the possibility of reviewer misunderstanding or of unwarranted damage to the first actuary's reputation,
 - reveals possible improvement to the first actuary's work, even if the work is in accordance with accepted actuarial practice, and
 - contributes to the professional development of both actuaries.

Difference between the two actuaries

- .17 It is possible for two actuaries properly to arrive at different results. Avoidance of a dispute about a difference which is not material, or explanation of a difference which is material, serves users and helps to preserve the reputation of the profession.
- .18 If the reviewer has access to different data, information, or resources, or has different time constraints, then the reviewer would so report.
- .19 Insufficiency or unreliability in the data creates uncertainty for both actuaries and increases the likelihood of reviewer disagreement with the first actuary's work. If better data are likely to narrow the range of the disagreement, then the reviewer would so report.

- .20 Discussion between the two actuaries is educational to both and may reveal possible improvements to the first actuary's work. The reviewer's report of those improvements assists the user to assess the utility of the review engagement. It may not be possible to identify those improvements which result from early discussion on matters which the first actuary had not yet decided.
- .21 Review by a third actuary of the reviewer's tentative disagreement with the first actuary's work may help to put the difference between them in perspective. Depending on the extent of the difference and its implications for the users, the reviewer, the first actuary, or both of them together, may wish to consult, in confidence, with the chairperson or vice-chairperson of the appropriate practice committee, the chairperson or vice-chairperson of the Practice Standards Council, or the chairperson or vice-chairperson of the Committee on the Application of Rules and Standards.
- .22 If the review is confidential, then the extent and duration of any exemption provided to the reviewer, as such, from the application of Rule 13 is limited to the circumstances described in its Annotation 13-1.

Review engagement which precludes discussion between the two actuaries

- .23 The reviewer would consider the appropriateness of a review engagement which precludes discussion with the first actuary, especially if the first actuary will not be apprised that the review is to take place. The engagement may be an appropriate engagement in, for example, any of the following cases:
- The interests of the first actuary's client or employer and the reviewer's client or employer are opposed, especially so in the case of actuarial evidence work involving litigation or mediation.
 - The reviewer's client or employer is the police or regulatory authorities who are investigating the first actuary's conduct or the conduct of the first actuary's client or employer.
 - The review is merely preliminary to a further review in which timely open discussion between the two actuaries will be possible.
 - Discretion by the users of the reviewer's report is assured.
- .24 For example, in the case of actuarial evidence work involving litigation or mediation, the reviewer may be asked to report, without discussion with the first actuary,
- results based on assumptions which differ from those in the first actuary's report, or
 - alternatives to the first actuary's reported results which are within the range of accepted actuarial practice.
- .25 An engagement which limits or delays discussion between the two actuaries may be an appropriate engagement if the reviewer's client or employer wants to ensure that the two reports are independent of each other.

Repeat engagement

- .26 In order to identify or reduce uncertainty, the first actuary's client or employer may ask a second actuary to repeat the first actuary's work. A repeat engagement usually requires more time and expense than a review engagement. The second actuary may or may not have knowledge of, or access to, the first actuary's work. If the second actuary knows or suspects that the engagement is a repeat engagement, then he or she would take into account the possibility that the client or employer is "opinion shopping" when determining if it is an appropriate engagement.

1700 ASSUMPTIONS

1710 NEEDED ASSUMPTIONS

- .01 *The needed assumptions for a calculation consist of model assumptions, data assumptions, and other assumptions.*
- .02 *There is a model assumption for each of the matters which the actuary's model takes into account. Those matters should be sufficiently comprehensive for the model reasonably to represent reality.*
- .03 *Data assumptions are the assumptions, if any, needed to relieve insufficiency or unreliability in the obtainable data.*
- .04 *The other assumptions are the assumptions about the legal, economic, demographic, and social environment on which the model and data assumptions depend. [Effective December 1, 2002]*

Model assumptions

- .05 A calculation requires a model, simple or complex, into which assumptions are set. The actuary's model depends on the purpose of the report and the sensitivity of the calculation's results to the various matters about which assumptions could be made. The actuary would strike a balance between the complexity needed for reasonable representation of reality and the simplicity needed for a practical calculation. If the model does not take into account a matter, then the result is an implicit assumption about that matter, usually an assumption of zero probability or zero rate. The actuary may compensate for an inappropriate implicit assumption on a matter which the model does not take into account by altering the explicit assumption on a matter which the model does take into account. For example:

If the model takes account of investment return but does not take account of the risk of asset depreciation. The result, as just noted, is an implicit assumption of zero depreciation.

To compensate, the actuary assumes an investment return rate which is, for example, the best estimate assumption of investment return minus 30 basis points (.3%).

- .06 The model assumptions are quantitative assumptions about contingent events, investment return and other economic matters, such as price and wage indices, and numerical parameters of the environment, such as the income tax rate.

Data assumptions

- .07 The available data may be not sufficient or not reliable. For example, files of pension plan members may lack the date of birth of the members' spouses. Based on sampling, or on comparison with comparable data, it may be appropriate to assume a relationship between spouse and member ages; for example, that a male spouse's date of birth is three years before the member's, and that a female spouse's date of birth is three years after the member's.

Other assumptions

- .08 The other assumptions are assumptions, usually qualitative, about the environment; for example, legislation, like the federal *Income Tax Act*, student education, the medical care system, government social security systems, and international treaties.
- .09 Those assumptions are needed to the extent that the model assumptions and, in some cases, the data assumptions depend on them. Such assumptions are numerous and it is not practical to identify all of them.

Needed assumptions

- .10 Here are examples of matters about which assumptions may be needed:

Economic

discount rates to calculate present values,
investment return rates earned on the investment of positive cash flow or which affects the price at which assets are sold in order to meet negative cash flow,
investment return rates earned on assets which support liabilities,
risk of asset depreciation (C-1 risk),
risk of changes in the level or term structure of interest rates (C-3 risk),
rate of interest on member contributions to registered pension plans,
price and wage inflation rates,
compensation increases,
compensation base on which increases are to apply,
productivity rates,
number of hours worked by employees,
behaviour of indices to which benefits are linked,
rate of increase in maximum allowable pensions under a registered pension plan, and
trend rate (by type of benefit provided under the plan) – initial rate, ultimate rate and the number of years and grading pattern to reach the ultimate rate.

Social

family composition,
marital status,
age difference between spouses, and
judicial decisions in litigation.

Decrement

termination of coverage voluntarily, or through job loss, death, disability, or failure to maintain eligibility.

Benefit entitlement

rates of death, disability, sickness, accident, unemployment, medical treatment, and early, normal, and deferred retirement,
election of options by members and policyholders, and
impact of benefit maxima.

Increment

rates of future new entrants.

Benefit continuance

death, disability recovery, remarriage, termination of economic dependency, and re-employment rates,
post-retirement pension adjustments, and
maintenance expense for a disabled person.

Claims development

reporting patterns,
settlement patterns,
reopened claims,
initial claims cost by type of benefit and age, and
cost-sharing arrangements (such as share of cost borne by members in the form of premiums or contributions, coinsurance, deductibles, annual and lifetime maxima, etc.).

Expense

expenses of marketing, administration, claim adjustment, and investment management.

Taxation

tax rates,
definition of tax base, and
limitations on the funding of registered pension plans.

Other

government benefit plan provisions and their integration with private sector plans, and
portion of claims costs paid under government programs.

1720 SELECTION OF ASSUMPTIONS

- .01 *The assumptions which the actuary selects or for which the actuary takes responsibility, other than alternative assumptions selected for the purpose of sensitivity testing, should in the aggregate be appropriate.* 1610
- .02 *The actuary should select each needed assumption except for those, if any, which are stipulated by the terms of the engagement.*
- .03 *If the actuary does not take responsibility for an assumption, then the actuary should so report. If the actuary considers it practical and useful to do so, the actuary should report the result of an alternative assumption. [Effective December 1, 2002]* 1530.12
1610.02
- .04 If each assumption is appropriate, then the assumptions in the aggregate are *ipso facto* appropriate. If the inappropriateness in a particular assumption is offset by the inappropriateness in another – for example if one is conservative and the other unconservative – then they are in the aggregate appropriate. Such practice may be expedient but introduces a risk of faulty offset.
- .05 Use of an assumption stipulated by the terms of the engagement is use of the work of another person.
- .06 If the stipulated assumption is appropriate but near the end of the accepted range, then it may be useful to report the result of an alternative assumption near the other end of the accepted range, especially in an external user report. Similarly for a stipulated assumption that, for example, the federal *Income Tax Act* continues as is when an amendment to it is virtually definitive.
- .07 In assessing the utility of reporting the result of an alternative to an assumption for which the actuary does not take responsibility, the actuary would consider the dependence of external users on his or her work. For example, utility in actuarial evidence work would be assessed in the context of the adversarial system in tort litigation, which expects each side to develop its own case without help from the other side, and to identify and expose any flaws in the other side's case. It is therefore consistent with that system for the actuary engaged by one side not to report the result of an alternative assumption if the lawyer for the other side is able to compel the actuary (or engage his or her own actuary) to calculate the result of a desired alternative. On the other hand, the members of a pension plan who use the actuary's work would usually depend entirely on the actuary's report to put in perspective the result of a biased assumption for which the actuary did not take responsibility.

1730 APPROPRIATE ASSUMPTIONS

- .01 *The appropriate model or data assumption for a matter is the best estimate assumption of that matter, modified, if appropriate, to make provision for adverse deviations, and taking account of*
- the circumstances of the case, past experience data, the relationship of past to expected future experience, anti-selection, the relationship among matters, and*
- in the case of assumptions on economic matters for calculation of liabilities in a balance sheet, the assets which support those liabilities at the calculation date and the expected policy for asset-liability management after that date.*
- .02 *The appropriate assumption for other matters is continuation of the status quo, unless there is none or unless it will change, and the actuary so reports. [Effective December 1, 2002]*

Acceptable range

- .03 Variability in the circumstances of cases is significant and calls for a significant variation in assumptions among cases. Usually, therefore, the actuary who is familiar with the circumstances of a case makes the best selection of assumptions for that case. Two actuaries, each familiar with the circumstances of a case, may select different assumptions for that case. That is acceptable if the range of their selections is appropriately constrained by standards of practice.
- .04 In other words, the crux of the matter is the selection of assumptions appropriate to a particular case from the relatively wide range of assumptions applicable to all cases. A relatively narrow range of assumptions among actuaries each selecting assumptions for a particular case is less important.
- .05 Sometimes, however, it is desirable that actuaries produce results within a relatively narrow range which the profession and the public perceive to be reasonable and consistent. It is then appropriate for the profession to supersede the actuary's selection by a prescription in the practice-specific standards that is within the range of assumptions otherwise considered acceptable.

Circumstances of the case

- .06 An assumption about a matter would take account of the circumstances of the case if those circumstances affect that matter.
- .07 The circumstances of the case affect experience on most matters other than economic matters. In the case of salaries, however, both the circumstances of the case and the economy affect experience.

Familiarity with the case

- .08 In selecting assumptions, the actuary would have knowledge of the case. That may involve consultation with the persons responsible for the functions which affect experience.
- .09 For example, if the calculation is to value the assets or liabilities of a benefits plan, then the actuary would consult the persons responsible for investments, administration, and decisions on plan changes. If the calculation is to value the policy liabilities of an insurer, then the actuary would consult the officers responsible for investments, underwriting, claims, marketing, product design, policyholder dividends, and policy servicing.

Past experience data

- .10 The available and pertinent past experience data are helpful in the selection of assumptions.
- .11 Other things being the same, pertinent past experience data are data
- of the case itself, rather than of similar cases,
 - of the recent past, rather than of the distant past,
 - which are homogeneous, rather than heterogeneous, and
 - which are statistically credible.

Usually, however, those criteria conflict with each other.

- .12 Consider, for example, claims experience data of a property and casualty insurer. Homogeneous claims are those for like policy benefits having like
- emergence patterns (for example, property insurance claims tend to be reported more quickly than liability insurance claims),
 - settlement patterns (for example, claims for glass damage tend to be settled more quickly than claims for bodily injury), and
 - frequency/severity: high frequency/low severity claims tend to be more stable than low frequency/high severity claims.
- .13 Combination of data, for example, a combination of the insurer's personal lines and commercial lines claims, or a combination of the insurer's claims on primary and excess coverages, make the data less homogeneous. Greater homogeneity requires separation into more groupings, each with fewer data and hence less statistical credibility.
- .14 To be statistically credible, the data may have to include data for the distant as well as the recent past. For example, as a result of periodic revisions to the insurer's policies, the available data may be for claims whose benefit dollar limits are lower than those limits for the claims being valued. Those data lack pertinence.

- .15 Similarly, the insurer's experience data may be unreliable or not statistically credible and the only available data may be intercompany experience data, which may lack pertinence to the insurer.
- .16 The actuary would be prudent in adjusting the available data to take account of the circumstances of the case. For example, without explicit justification, the actuary would not select a best estimate assumption which is more favourable than intercompany experience data in valuing an insurer's policy liabilities.

Expected future experience vs. past experience

- .17 To extrapolate pertinent past experience and its trend to the near future is often, but not necessarily, appropriate. The appropriateness of the extrapolation depends on the matter assumed; for example, pertinent past mortality experience is a better indicator of the outlook than is pertinent past investment return experience. Moreover, any extrapolation would take account of a change which affects the outlook; for example:

adoption of a subsidized early retirement option in a pension plan may affect retirement rates,

a change in an insurer's case estimate practices may affect its claims development,

an insurer's discontinuance of a line of business may affect its expense rates allocable to the remaining lines, and

a change in judicial practice may affect the settlement of claims.

Anti-selection

- .18 Each assumption would normally take account of potential anti-selection.
- .19 One party in a relationship may have the right (or the administration of the relationship may give the privilege) to exercise certain options. That party may be expected to exercise those options to the detriment of the other party in the relationship if it is to the first party's advantage to do so. The first party may be an insurer's policyholder, a benefits plan's member, a borrower, a lender, or a shareholder.
- .20 Examples are the right or privilege of a

pension plan member to select his or her retirement date when the pensions at various retirement ages are not actuarially equivalent,

policyholder to renew term life insurance at its expiry for a stipulated premium,

mortgagor to prepay principal, or an issuer to call a bond or redeem a preferred share, and

a shareholder to retract a share.

- .21 A particular policyholder or plan member exercising a particular option may not be sure that the chosen option is the most advantageous. It is plausible, however, and experience has shown, that policyholders and plan members who can profit from doing so tend to exercise those options to the detriment of the insurer or plan. In the above example of a policyholder's right to renew term life insurance, the stipulated renewal premium to an unhealthy policyholder is less than the premium for a new policy whose purchase is subject to underwriting; the healthy policyholder may be able to purchase replacement insurance for less than that renewal premium.
- .22 Anti-selection also occurs when price does not take proper account of risk classification and the customer is free to buy or not, or to select among sellers. For example, the conversion at retirement of an employee's accumulated fund in a defined contribution pension plan tends to be more attractive to a female than a male if the conversion basis is the same for both. Similarly, automobile collision insurance tends to be more attractive to a young single male than to other members of the driving population if the premium is uniform.
- .23 The extent of anti-selection depends on
- the size of the advantage from each exercise of the option (for example, anti-selection is dampened if the advantage to each policyholder is small even when the aggregate potential detriment to an insurer is large),
 - the concomitance of exercise of the option (for example, election of a favourable early retirement pension may force the plan member into unwanted unemployment, or a policyholder in ill health may be unable to afford to continue an insurance policy with a low premium),
 - the policyholder's or plan member's difficulty in making the required judgment (for example, everyone knows his or her age, but a person in ill health may be unable to gauge its effect on longevity), and
 - the sophistication of the policyholder, plan member, borrower, lender or shareholder.

Related assumptions

- .24 Assumptions may be interrelated. For example:
- Interest rates and inflation rates may be related.
 - Investment policy affects the risk related to interest rate swings.
 - Voluntary termination rates may affect death rates through anti-selection.

Supporting assets

- .25 The investments which support the liabilities at the calculation date and the expected policy for asset-liability management after that date determine matters on which assumptions are needed. For example:

If those investments include bonds rated A–, then an assumption of asset depreciation of those bonds is needed. That depreciation is usually expressed as a deduction from the assumed gross yield.

If that policy includes purchase or sale of such bonds with a particular remaining term, then an assumption of yield on those bonds with that term is needed.

Indexing of benefits

- .26 Workers' compensation benefits are usually indexed to inflation or wage rates, as are certain pension benefits. In such cases, the needed assumption is of the "net" or "real" rate of investment return. While there may be no need for separate assumptions of investment return rates and of inflation or wage rates, it may, in some cases, be preferable to report them separately.
- .27 The indexing may be partial; for example, benefits may be indexed to inflation, subject to a maximum increase of 3% during any year. In such cases, the separate assumptions of investment return rates and of inflation or wage rates are needed in a refined assumption, but a "net" or a modified "net" assumption may be a satisfactory approximation. The approximation techniques for partial indexing in the calculation of transfer values from registered pension plans may be useful.

Assumptions other than model and data assumptions

- .28 Continuation of the status quo is usually the appropriate assumption for other than model and data assumptions; for example, that the fund of a registered pension plan continues to be untaxed or that the capital markets remain more or less as they are. Users may infer that assumption except where the actuary reports otherwise. The actuary would report an assumption

which is different from continuation of the status quo, and

on a matter for which there is no status quo, for example, a student's assumed occupation after completion of education.

- .29 The actuary would also report an assumption of continuation of the status quo whose outlook is doubtful; for example, enactment of a change in tax rates whose proclamation is doubtful or likely to be deferred. It may be useful to report the result of two assumptions without opining on their relative appropriateness and to recommend that each user select that which meets his or her needs.
- .30 An extreme assumption may be appropriate, but in that case the actuary would also report the result of the opposite extreme.

1740 PROVISION FOR ADVERSE DEVIATIONS

- .01 In this subsection, “provision” means “provision for adverse deviations”.
- .02 *A calculation should not include a provision if the related work requires an unbiased calculation.* 1740.06
- .03 *Otherwise, if a provision promotes expectations for financial security, then the calculation should include a provision which* 1740.09
- strikes a balance among the conflicting interests of those affected by the calculation, and*
- takes account of the possibility to offset the effect of adverse deviations by means other than a provision.* 1740.11
- .04 *The amount of that provision should*
- take account of the effect of the uncertainty of the assumptions and data for the calculation on the financial security of those affected by the calculation,* 1740.13
- not take account of the possibility of catastrophe or other major adverse deviation which is implausible in usual operations, except when the calculation specifically addresses that possibility, and* 1740.17
- in the case of a provision in respect of uncertainty of assumptions, result from selection of assumptions which are more conservative than best estimate assumptions.* 1740.20
1740.27
- .05 *The margin for adverse deviations in each assumption should reflect the uncertainty of that assumption and of any related data. [Effective May 1, 2006]* 1740.37
1740.20

Unbiased Calculations

- .06 A provision is contrary to the purpose of the work if the work requires an unbiased calculation, as it does, for example, in splitting the value of a pension benefit fairly between two parties.
- .07 The purpose of a provision is to promote financial security, but it does not follow that there should be a provision simply because financial security is thereby promoted. A provision is used when the entity benefiting from the enhanced financial security has a reasonable expectation that such enhanced security exists. For example, inclusion of a provision for one party in a calculation designed to value a benefit fairly between two parties would promote the financial security of one party at the expense of the other party.
- .08 An unbiased calculation may be described in a variety of ways: “neutral”, “even-handed”, or using “best estimate assumptions”, or “best estimates”.

Conflicting interests

- .09 A provision in a calculation is a bias which may affect two conflicting interests in opposite ways. Hence the need to strike a balance. 1740.30
1740.32
1740.36

- .10 In some cases, the conflicting interests are those of separate users of the actuary's work. In other cases, the conflicting interests are internal to a single user of the actuary's work. For example,

Provision in an insurer's scale of premium rates promotes financial security of its shareholders, but any provision makes the scale less competitive in the marketplace and so militates against another interest of those shareholders.

Provision in funding a pension plan lessens the likelihood that the contributor will be obliged later to increase contributions, but increases the likelihood of later surplus in the plan which may be unavailable to the contributor.

Offsetting adverse deviations by other means

- .11 There may be means other than a provision to offset the effect of adverse deviations. If they exist, those other means tend themselves to involve uncertainty but, to the extent that they are credible, the actuary would approximately reduce the provision, thereby avoiding the distortion which the provision causes. Healthy skepticism is appropriate in assessing their credibility.
- .12 One example of other means is a retrospective rating, when a policyholder is insured at a premium calculated from best estimate assumptions but with an undertaking to reimburse the insurer for adverse deviations in experience.

1740.23

Uncertainty

- .13 If assumptions could be made with complete confidence, if there were no statistical fluctuations, and if data had no defect, then there would be no need for a provision. But assumptions are virtually always uncertain; the exceptions, such as the assumption of the probability of getting a head when tossing a coin, are rarely encountered in practice. Some, especially those about events long after the calculation date, may be conjectural. Even when an assumption can be made with high confidence, the result may be subject to statistical fluctuation; one may not get 5 heads when tossing a coin 10 times.
- .14 Uncertainty in an assumption results from the risk of
- misestimation of the best estimate assumption (sometimes referred to as "misestimation or deterioration of the mean") in the case of all assumptions, and
- statistical fluctuation in the case of aleatory assumptions.
- .15 The risk of defective data also creates uncertainty. Data, especially voluminous or complex data, are rarely without defect.
- .16 That uncertainty of assumptions and data may militate against the financial security of those affected by the calculation. A provision reduces the potential adverse effect of that uncertainty.

Catastrophe or other major adverse deviation

- .17 The provision would not exceed the amount needed fully to offset the effect of adverse deviations which are plausible in usual operations. The provision would only partially offset the effect of catastrophe or other major adverse deviations which are not plausible in usual operations.
- .18 It is difficult to quantify the distinction between adverse deviations which are, and which are not, plausible in usual operations. For each situation, the actuary would adopt a distinction which results in a provision which is not excessive. The intent of the provision is to enhance financial security, but provision for 100% security is excessive.
- .19 The recommendation not to take account of the possibility of catastrophe or major adverse deviation does not apply to a calculation which specifically addresses that possibility; for example, calculation of the minimum capital which an insurer needs in order to have a satisfactory financial position, or a calculation with respect to stop-loss reinsurance, for which catastrophe is the event insured against.

Selection of conservative assumptions

- .20 To make provision in respect of uncertainty of assumptions, the actuary would in some cases select assumptions which, either individually or in the aggregate, are more conservative than best estimate assumptions. Testing may be needed to assure that a contemplated assumption is in fact more conservative than the corresponding best estimate assumption.
- .21 Examples of use of conservative assumptions are
- a best estimate assumption combined with a margin for adverse deviations, and
 - scenario testing of a range of assumptions and selection of a scenario (or a point between two scenarios) which produces a result which is toward the conservative end of the range of possible results.
- .22 One actuarial cost method may be more conservative than another. For example, other things being the same, the entry age normal actuarial cost method, when applied to a group, usually results in higher contributions to a pension plan than the unit credit actuarial cost method. If the unit credit method is the appropriate method, then it would not be appropriate to make provision for adverse deviations by using the entry age normal method and best estimate assumptions. The reason is that there is no assurance that the amount of such a provision is appropriate. The better practice is to make the provision through selection of conservative assumptions.

Adjustments to policyholder dividends, premium rates, contributions, and benefits

- .23 Those adjustments can offset the effect of adverse deviations.
- .24 The insurer promises to declare policyholder dividends in accordance with experience, but does not promise a specified amount of dividends. An insurer's participating insurance policy liabilities include the present value of expected future policyholder dividends. If the insurer experiences adverse deviations and reduces dividends as a result, then the amount included in policy liabilities corresponding to the reduction in dividends becomes available for other

promised benefits and therefore is not needed in the provision. If the amount included for dividends is large, and if the insurer's management of its dividend practices is responsive to change in conditions, then a minimal or, in the extreme case, zero provision for adverse deviations is appropriate.

.25 Similarly, in the event of adverse deviations, contributions may be adjusted, decreases in benefits or even winding-up of the plan may be possible, and the plan may have surplus which can substitute for contributions.

.26 Those adjustments are rarely fully credible. For example, an insurer's legal right to adjust policyholder dividends may be constrained by inertia or marketplace forces; a participating employer who can afford to pay higher contributions today may be unable to do so later; substitution of surplus for contributions may be restricted, and assessment of insurer's or participating employer's ability to make the adjustment may be difficult or impractical.

Provision of zero

.27 A provision of zero is appropriate in two situations, as follows:

work which requires an unbiased calculation. In that situation, the provision of zero is always appropriate;

where the actuary considers a provision but concludes that a provision does not promote expectations for financial security or that there are other means which reduce or eliminate the need for the provision.

Examples

.28 Two important examples of provision for adverse deviations are in the valuation of

the policy liabilities of an insurer for its financial statements if they are prepared in accordance with generally accepted accounting principles, and

the liabilities of a benefits plan if the actuary is giving advice on its funding.

.29 In valuing those liabilities, the actuary would strike a balance between security of benefits promised to policyholders or plan members and equity among conflicting interests.

Security of benefits promised

.30 A provision in liabilities reduces the likelihood that their amount will later prove to be inadequate. As well, if those liabilities (including the provision) are funded (i.e., fully supported by investments) and the provision accelerates the funding of those liabilities, then the provision promotes security of those benefits.

.31 On the other hand, if those liabilities are unfunded, then the provision has no explicit effect on the security of those benefits, (unless some action results which improves benefit security) since the actual ultimate value of the benefits has not changed and neither has the likelihood of them being paid.

Generations of policyholders, shareholders or plan members

- .32 The amount of a provision increases the liabilities of an insurer or a benefits plan, and decreases its equity or surplus, or increases its unfunded liabilities, by the same amount. If the later experience is according to the best estimate assumptions, then the provision will revert to equity or surplus and be available to finance policyholder dividends or benefit increases or contribution decreases. That is an inequitable result if one generation of policyholders, shareholders or plan members bears the cost of making the provision, and if a later generation makes a windfall from its reversion to equity or surplus, but, in striking a balance, the actuary may have to give financial security greater importance than equity unless the terms of the engagement suggest otherwise.
- .33 In the case of policyholders, the provision and its later reversion may affect dividends on participating policies and premiums and benefits on adjustable non-participating policies. It is appropriate for the insurer to manage its dividends and adjustments so that an unneeded provision reverts to the policyholders who made it.
- .34 In the case of shareholders of a client or employer, a provision and its later reversion could transfer share value from the current to a future group of shareholders.
- .35 In the case of benefits plan members, the provision and its later reversion may affect benefits or the members' share of contributions. In those cases, it may be difficult to strike a balance between financial security and the various generations of plan members. The importance of inter-generational interests varies, however, among plans. It tends, for example, to be a more important consideration in

contributory plans when the members pay a percentage share of the contributions,
and

multi-employer plans with negotiated contributions.

Policyholders versus shareholders, and plan members versus the participating employer

- .36 A provision tends to favour policyholders and benefits plan members at the expense of the participating employer and the insurer's shareholders. A participating employer, by establishing a benefits plan, and an insurer, by selling policies, create reasonable expectations among benefits plan members and policyholders for payment of the promised benefits. The actuary would therefore strike a balance which promotes security of promised benefits but which is not excessive. An excessive provision would militate against the willingness of participating employers to improve plan benefits and the ability of insurers to raise needed capital.

Reporting the provision

- .37 The actuary would usually make the calculation including the provision. It is not necessary to report the amount of the provision itself, and in some situations, may be misleading to do so without also reporting a discussion of the related uncertainty and risk. The actuary would calculate the amount of the provision as the difference between the results of two calculations; namely, a calculation including the provision, and one not including the provision; that is practical only when the actuary selects the best estimate assumptions explicitly.

- .38 Reporting the amount of the provision is usually accompanied by a discussion of the related uncertainty and risk. [Effective May 1, 2006]

Assumptions: margin for adverse deviations

- .39 The standards in this subsection apply to the selection of a margin for adverse deviations in an assumption if the actuary uses that margin in order to make provision for adverse deviations. The standards do not apply when the margin in an assumption makes provision for another purpose, such as to make future benefit improvements.

- .40 A margin for adverse deviations may be expressed as one of:

The difference between the assumption used for the valuation and the best estimate assumption. For example, if the actuary expects the interest rate to be 10% and assumes 8%, then the margin for adverse deviations is 2%. The provision for adverse deviations is the dollar amount of increase which results from a margin for adverse deviations. For example, if that 2% margin for adverse deviations in the interest rate assumption increases liabilities from \$100 million to \$120 million, then the provision for adverse deviations is \$20 million.

A multiplier to the liabilities without provision for adverse deviations. For example, if the actuary sets claim liabilities equal to 1.1 x expected claim liabilities, then the margin for adverse deviations factor is 10% and the provision for adverse deviation is .1 x expected claim liabilities.

An addition to the liabilities without provision for adverse deviations, determined through scenario testing.

- .41 Actual future experience will be equal to the combined effect of
expected experience (i.e., in accordance with the best estimate assumption), and
deviation, favourable or adverse, from expected experience.
- .42 Deviation of actual from expected experience may result from one or more of the following:

Error of estimation, which may be favourable or adverse. Except in the simplest cases, it is not possible to determine expected experience with complete confidence. Past experience data may be insufficient or unreliable. Future conditions may differ from the conditions which generated the past experience.

Deterioration or improvement of the expected experience as a result of influences which the actuary does not anticipate.

Statistical fluctuation, which also may be favourable or adverse.

.43 A larger margin for adverse deviations (compared to the best estimate assumption) is appropriate if

the actuary has less confidence in the best estimate assumption,

an approximation with less precision is being used,

the event assumed is farther in the future,

the potential consequence of the event assumed is more severe, or

the occurrence of the event assumed is more subject to statistical fluctuation.

.44 A smaller margin for adverse deviations is appropriate if the opposite is true.

.45 In principle, it is better to reflect an assumption's uncertainty by a margin for adverse deviations in the assumption itself rather than by adjustment to another assumption. For example, except in case of approximation, it is not accepted actuarial practice to make provision for adverse deviations in claim liabilities by assuming that the investment return rate is zero; i.e., by valuing the liabilities undiscounted.

.46 Selection of a relatively large margin for adverse deviations for the assumption whose uncertainty most affects the calculation and a zero margin for the others may be an appropriate approximation.

1510

.47 The choice of the sign (+ or -) of the margin for adverse deviations (i.e., whether the assumption for the valuation is larger or smaller than the best estimate assumption) is sometimes complex, and testing may be necessary to ensure that the margin affects the calculation in the desired direction; i.e., to ensure that the margin is not a margin for favourable deviations. For example:

In the valuation of insurer policy liabilities, the margin for the withdrawal rate assumption may be positive at some policy durations and negative at other policy durations.

In the valuation of the liabilities of a pension plan, a positive margin for the early retirement rate assumption usually, but not always, increases the liabilities, so testing is needed to determine the sign of the margin.

.48 A margin with the seemingly wrong sign in one assumption, is however, appropriate if it ensures consistency with a related assumption having a greater effect on the calculation. For example, in the valuation of liabilities, the margin in the interest rate assumption is usually negative and the margin in the inflation rate assumption is usually positive. If, however, the actuary assumes that the inflation rate is the nominal interest rate minus the real interest rate, then both margins have to have the same sign to ensure consistency: negative if investment income has the greater effect, positive if expenses or inflation-indexing of benefits has the greater effect.

1750 COMPARISON OF CURRENT AND PRIOR ASSUMPTIONS

- .01 *Unless the actuary reports the inconsistency, the assumptions for a calculation for a periodic report should in the aggregate be consistent with those of the prior calculation. [Effective December 1, 2002]*
- .02 The definition of consistency for the purpose of this recommendation varies among practice areas. For advice on funding a pension plan, the assumption at a calculation date is consistent with the corresponding assumption at the prior calculation date if the two are nominally the same. For example, if the investment return rate assumption is 6.5% at the current calculation date and was 7% at the prior calculation date, then the actuary would report the change even if the outlook had changed downward by .5% between the two dates.
- .03 For valuation of an insurer's policy liabilities for its financial reporting, an assumption at a calculation date is consistent with the corresponding assumption at the prior calculation date if the two assumptions
- each reflect the conditions and outlook at their respective calculation dates in the case of a best estimate assumption,
 - each reflect the risks at their respective calculation dates in the case of a margin for adverse deviations, and
 - are located at the same point within the range of accepted actuarial practice.
- .04 The assumptions at a calculation date are in the aggregate consistent with the corresponding assumptions at the prior calculation date if
- each assumption is so consistent, or
 - there are inconsistencies among the assumptions but the result of the calculation is the same as if each assumption were so consistent.
- .05 If the assumptions are in the aggregate not so consistent, then the actuary would report the inconsistency. If practical and useful, the report would quantify the effect of the inconsistency.

1800 REPORTING

1810 STANDARD REPORTING LANGUAGE

- .01 *The actuary's external user report should incorporate any standard reporting language applicable to the work.* [Effective December 1, 2002]
- .02 The practice-specific standards for work describe any applicable standard reporting language.
- .03 The purpose of standard reporting language is to simplify the actuary's communication with users by creating a clear, easy to recognize, distinction between the usual situation and the unusual (sometimes problem) situation. The standard reporting language, while abbreviated, acquires precision by the convention that the situation is usual if there is no reservation. Any reservation is disclosed in a special paragraph and described either there or by reference. Standard reporting language is thus similar to the auditor's standard report on financial statements.
- .04 The standard reporting language may comprise a complete report; for example, an appointed actuary's report accompanying the financial statements of an insurer. Alternatively, it may be included in a larger report; for example, a report giving advice on funding a pension plan.
- .05 Here is the skeletal structure of standard reporting language:

Addressee, which usually identifies the client or employer.

Scope paragraph, which describes the work and its purpose and says that the work was done in accordance with accepted actuarial practice in a usual situation, or that it was done in accordance with accepted actuarial practice "except as described in the following paragraph" in an unusual situation.

Reservations paragraph (omitted in the usual situation), which either compares the particular (unusual) situation to the usual situation or refers to that comparison elsewhere.

Opinion paragraph, which reports the actuary's opinion, without reservation in a usual situation and with reference to the reservations paragraph in an unusual situation. The opinion paragraph either reports the result of the work, which is practical only if the result is short, or references its location.

Identification of the actuary.

Report date.

1820 REPORTING: EXTERNAL USER REPORT

- 1610
- .01 *In an external user report, the actuary should* 1820.06
- identify the client or employer,* 1820.12
- describe the work, its purpose, and its users,* 1820.16
- say whether or not the work is in accordance with accepted actuarial practice and, if not, disclose the deviation from that practice,* 1820.18
- if useful, disclose any unusual application of accepted actuarial practice,* 1820.20
- disclose any aspect of the work for which the actuary does not take responsibility,*
- disclose any assumption which is different from assumption of continuance of the status quo and, if practical and useful, disclose the effect of alternative assumptions,*
- in the case of a periodic report, disclose any inconsistency between the methods and assumptions of the current and prior reports,*
- describe any subsequent event which is not taken into account in the work,* 1520
- disclose any reservation,* 1820.23
- express an opinion on the results of the work,* 1820.27
- identify himself or herself and sign the report, and* 1820.29
- date the report.* 1820.30
- .02 *Any description or disclosure may be in material referred to in the report and either accompanying the report or plausibly available to users.*
- .03 *Subsequently, the actuary should respond to a user's request for explanation except if that is contrary to the terms of the engagement.*
- .04 *Subsequently, the actuary should withdraw or amend the report if information comes to hand after the report date which invalidates the report.*
- .05 *A duty of confidentiality in an appropriate engagement supersedes any of the foregoing portions of this recommendation with which it conflicts, but does not supersede an actuary's obligations to the Institute, pursuant to the Bylaws or the Rules of Professional Conduct. [Effective December 1, 2002]*

Description and disclosure in general

- .06 The range of appropriate reports is relatively narrow for external user reports as compared to that for internal user reports. An external user report is relatively formal and detailed when the actuary does not communicate directly with users or when the interests of an external user and of the actuary's client or employer do not run together.
- .07 Appropriate description and disclosure in a report strike a balance between too little and too much. Too little deprives the user of needed information. Too much may exaggerate the importance of minor matters, imply a diminution of the actuary's responsibility for the work, or make the report hard to read.
- .08 The appropriate criterion for description and disclosure is the question: what qualitative and quantitative information best serves the user's understanding and decision-making? The question: "what information does the user want?" is an insufficient criterion because the circumstances of a case may make the actuary aware of information needs of which the user is unaware.
- .09 Reporting the sensitivity of the results to variations in assumptions is often useful.
- .10 Disclosure need not necessarily be in the report itself except if its importance so warrants or if it cannot be referenced in material available to users. Disclosure in a short report may place undue emphasis on the information disclosed.
- .11 An unintended reservation misleads the user if it implies either that there was a deviation from accepted actuarial practice or that the actuary does not take full responsibility for the work. For example:

Approximation is a usual part of work. Even a moderately complex calculation may involve many approximations. Disclosure of an appropriate approximation may mislead the user by implying that the actuary's work falls short of accepted actuarial practice.

Use of another person's work is also a usual part of work. If the actuary does not take responsibility for the used work, then disclosure is appropriate. Disclosure if the actuary does take responsibility for the used work may mislead the user.

Deviation from a particular recommendation or other guidance in the standards when the result of doing so is not material is also a usual part of work and its disclosure is undesirable.

The work, its purpose, and its users

- .12 Description of the work usually includes the calculation date and the numerical result. If the work is required by law, then citation of the law is useful.
- .13 The amount of detail depends mainly on the needs of users. A separate report may be desirable for a particular user (usually a regulator) whose desire for detail significantly exceeds that of other users.

- .14 Description of the purpose of the work and its users permits another person to assess its appropriateness to his or her needs and may thereby avoid unintended use of the work.
- .15 The users comprise the addressee(s) of the report, and any others explicitly identified in the report.

Accepted actuarial practice

- .16 If the work is in accordance with accepted actuarial practice, then a simple statement to that effect is a powerful statement, and reassuring even to a user with a limited understanding of what accepted actuarial practice is. If the work is not in accordance with accepted actuarial practice, then a statement that it is, except for specified deviations, is a concise description.
- .17 Any deviation from accepted actuarial practice would result from either conflict with law or conflict with the terms of an appropriate engagement. 1310
1320

Unusual application of accepted actuarial practice

- .18 The actuary would not usually report a deviation from a particular recommendation or other guidance in the standards as a result of an unusual or unforeseen situation. 1330
- .19 If, as is common, accepted actuarial practice for an aspect of the work encompasses a range, then the actuary usually reports the work as in accordance with accepted actuarial practice without drawing particular attention to his or her selection within the range. Disclosure of the selection, and of the reason for selecting it, is appropriate, however, if it is any of the following:
- specified by law or by the actuary's client or employer, 1410
 - excluded from the accepted range by an exposure draft or by approved, but not yet effective, new standards, 1210
 - inconsistent with the corresponding assumption of a prior periodic report, 1750
 - dependent on a special permissive feature in the law for its acceptability, or
 - unusual or controversial.

Limitation to actuary's responsibility

- .20 Any diminution of the actuary's responsibility for the work as a result of an engagement whose terms call for a deviation from accepted actuarial practice would be disclosed. 1320

Disclosure of Assumptions

- .21 Disclosure of an assumption includes its description, and, if practical and useful, quantification of alternative assumptions.

Subsequent event not taken into account in the work

- .22 An example of a subsequent event not taken into account in the work is a non-retroactive increase in the benefits of a pension plan for which the actuary is advising on funding. The actuary would describe the increase, report that it was not taken into account in the current advice on funding but that it will be taken into account in future advice, and, if useful, quantify its effect, for example by reporting the pro forma effect on the recommended funding if the benefit increase were effective immediately before the calculation date.

Reservations

- .23 A report with reservation may be undesirable but is unavoidable in the following examples:

The actuary was obliged to use the work of another person and has doubts about the appropriateness of so doing.

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The actuary was obliged to use insufficient or unreliable data.

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There was an undue limitation to the scope of the actuary's work. For example, the time, information, or resources contemplated by the terms of the engagement did not materialize.

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There is an unresolved conflict of interest. Rule 5 permits the actuary who has a conflict of interest to perform professional services if stated conditions are met. In reporting in such a case, it is good practice to note the conflict and confirm that the conditions are met. If, as a result of an apparent but not actual conflict, a user might doubt the actuary's objectivity, then it is useful to report why the conflict is not real. There is no conflict of interest, however, merely because a user and the actuary's client or employer have conflicting interests.

- .24 The actuary would report any remedy, underway or expected, to the problem causing the reservation.

- .25 A serious reservation may call for consultation with another actuary or legal advice.

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- .26 Barring explicit disclosure to the contrary in the report, the user is entitled to assume that

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the work is in accordance with accepted actuarial practice and no reservation is required,

the actuary takes responsibility for all of the work, and

if a periodic report, then the method is the same as that in the prior report and the assumptions are consistent with those in the prior report.

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Opinion

- .27 In giving an opinion, the actuary would begin with “In my opinion,...” which is a signal that he or she is giving a formal, professional opinion on a matter within the domain of actuarial practice. The actuary would add appropriate qualification when giving an opinion on a matter outside that domain but on which he or she is able to comment. For example:

“The valuation of Mrs. Smith’s life interest in Mr. Smith’s estate, and the residual value, both depend on the future value of the residential property which makes up the bulk of that estate. An assumption about future real estate values for any given property is outside the domain of actuarial practice but, in my opinion, it is reasonable to assume that property values will generally continue to increase over time at the same rate as inflation.”

- .28 It may be better to disclose an assumption selected by the client or mandated by law without giving an opinion on it; for example:

“On your [lawyer-client’s] instruction, I assume that the career path of the [injured high school student] is to complete her high school education and then to obtain an undergraduate university degree.”

Identification

- .29 The actuary would usually identify himself or herself simply as “Fellow, Canadian Institute of Actuaries” (or “FCIA” if users recognize the abbreviation), especially when Fellowship in the CIA is required or expected for the work. To add additional identification, such as

the actuary’s relationship with the client or employer (e.g., “Vice-President and Actuary” or “Consulting Actuary”), or

the actuary’s other professional qualification (e.g., “Fellow of the Casualty Actuarial Society”)

may be appropriate but may create confusion about the actuary’s qualification to sign the report and about the standards governing the work, and may diminish the standing of the Institute.

Report date

- .30 In reporting an opinion, the actuary would consider all available information up to the report date, including subsequent events if the report date is after the calculation date.

- .31 The report date would usually be the date at which the actuary has substantially completed the work. The remaining effort may include peer review, typing and photocopying the report, and compilation of documentation.

- .32 The date the actuary signs and delivers the report would be as soon thereafter as practical. If there is an unavoidably long delay, however, then the actuary would consider any additional subsequent events which would result from a current report date.

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Withdrawal or amendment of a report

- .33 After the report date, the actuary has no obligation to seek additional information which, if known at the report date, would have affected the report, but, if additional information comes to hand, would consider if it invalidates the report. Additional information invalidates the report if it
- reveals a data defect or a calculation error,
 - provides additional information about the entity which is the subject of the report as that entity was at the calculation date,
 - retroactively makes that entity a different entity at the calculation date, or
 - makes that entity a different entity after the calculation date and a purpose of the work was to report on the entity as it would be as a result of the information.
- .34 That additional information consists of both external information and internal discovery of an error in the work. Its classification is similar to the classification of subsequent events. That is, if the additional information were a subsequent event, and if it would have to be taken into account in the data, methods, or assumptions for the work, then it invalidates the report. It does not invalidate the report if it makes the entity which is the subject of the report a different entity after the calculation date and a purpose of the work is to report on the entity as it was at the calculation date; for example, if the additional information changes the outlook for the entity which would lead the actuary to select different assumptions at the next calculation date for a periodic report.
- .35 If the actuary withdraws or amends a report, then he or she would seek agreement with the client or employer on the notification to be given to users and on the preparation of an amended or replacement report in cases where there is no legal requirement to do so. Failing such agreement, the actuary would consider seeking legal advice on the discharge of his or her responsibilities, taking consideration of the fact that, to the extent practical and useful, all users should so be informed.

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1830 REPORTING: INTERNAL USER REPORT

- .01 *In the case of an internal user report, the actuary may appropriately abbreviate the recommendation for external user reports. [Effective December 1, 2002]*
- .02 The range of appropriate reports is wider for internal user reports than for external user reports. At one end of the range, a formal internal user report may differ little from an external user report. At the other end of the range, an informal, abbreviated, even oral, report may suffice for an officer with whom the actuary communicates frequently and who is well-versed in the subject of the report. To abbreviate the standards for an internal user report is efficient for both the actuary and the user provided that complete and clear communication is not thereby compromised.

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1840 REPORTING: ORAL REPORT

- .01 Oral reporting, especially to an internal user, is both useful and inevitable in some situations. The disadvantage of oral reporting is that the actuary and user may have differing recollections of what was reported. It is therefore good practice to confirm an oral report in writing, especially when there is an external user, or to record it in documentation.
- .02 Except for signature and report date, the standards are the same for both oral and written reports.

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2000—INSURERS

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2100 VALUATION OF POLICY LIABILITIES: ALL INSURANCE

2110 SCOPE

- .01 The standards in sections 2100, 2200 and 2300 apply to the valuation of the policy liabilities in an insurer's financial statements if the intent is that those statements be in accordance with generally accepted accounting principles. The standards in Part 2000 do not apply to post-employment benefit plans covered by the Practice-Specific Standards for Post-Employment Benefit Plans and do not apply to personal injury compensation plans covered by the Practice-Specific Standards for Public Personal Injury Compensation Plans.
- .02 The standards in this section 2100 apply to all kinds of insurance. The standards in sections 2200 and 2300 following apply respectively to
- property and casualty insurance; that is, to insurance with respect to property (for example, fire and marine insurance), to insurance with respect to the actions of individuals and corporations (for example, liability and fidelity insurance), and to insurance with respect to both (for example, automobile insurance), and [2200](#)
 - life and health insurance (accident and sickness); that is, to insurance with respect to the life and health of persons other than corporations. [2300](#)
- .03 Sometimes, however, techniques described in one section may be useful for the insurance to which the other section applies. For example, while a simple technique is usually appropriate for valuation of life and health insurance claim liabilities, the more sophisticated techniques for valuation of property and casualty insurance claim liabilities may be appropriate for life and health insurance whose claim development is complex. Another example is that a simple technique may be appropriate for travel insurance and other short-term policies sold by property and casualty insurers.

2120 EXTENSION OF SCOPE {tc "Extension of scope " V 2}

- .01 The standards in section 2100, 2200 and 2300 also apply to financial statements of a quasi-insurer if the intent is that those statements be in accordance with generally accepted accounting principles. The actuary would modify the standards to take account of any substantive difference between that quasi-insurer and an insurer; for example, the quasi-insurer's liabilities may be permitted to be less than fully funded. That report would describe the modifications to the standards and their implications.

.02 In part 2000, “quasi-insurer” means an entity which assumes risks which an insurer may assume, without having the legal form of an insurer. Examples of a quasi-insurer are [2140.21](#)

- a federal or provincial crown corporation or agency acting in a capacity similar to a property and casualty insurer,
- a reciprocal insurance exchange,
- a provider of extended warranties,
- a self-funding mechanism, such as a facility association, and
- a charity or not-for-profit organization that issues “self-insured” gift annuities.

.03 The standards in part 2000 may also provide useful guidance for an actuary’s report on the valuation of liabilities for an enterprise which is not an insurer but whose operations include benefits which an insurer may provide. [2110.02](#)

.04 The standards in part 2000 may also provide guidance for a valuation in accordance with a different basis of accounting; for example, where the policy liabilities are calculated in accordance with regulatory prescription which differs from accepted actuarial practice and generally accepted accounting principles.

2130 METHOD {tc "Method " V 2}

.01 *The actuary should value the policy liabilities for the balance sheet and the change in those liabilities for the income statement.*

.02 *The actuary should co-ordinate the valuation with the insurer’s accounting policy as respects the choice between going concern and wind-up accounting, and so that the policy liabilities and other items in the balance sheet*
are consistent,
avoid omission and double counting, and
conform to the presentation of the income statement.

.03 *The relevant policies for the valuation are those which are in force, including those whose issue is then committed, at the balance sheet date, or which were in force earlier and which will generate cash flow after the balance sheet date.*

.04 *The policy liabilities in respect of each of the relevant policies should comprise the net cash flow after the balance sheet date from the premiums, benefits, claims, expenses, and taxes which are incurred during the term of its liabilities.* [2210.02](#)
[2320.04](#)

.05 *The comprised cash flow should include the effect of*
retrospective premium, commission, and similar adjustments,
experience rating refunds,
reinsurance ceded,
subrogation and salvage,
the exercise of policyholder options, and
the deemed termination at the end of the term of its liabilities of each policy then in force.

- .06 *The valuation should take account of the time value of money. [Effective January 1, 2003]*
- .061 *The actuary should ensure that the application of a margin for adverse deviations results in an increase to the value of the liability net of reinsurance. The provision resulting from the application of all margins for adverse deviations, in addition to increasing the net liability, should be appropriate in the aggregate. [Effective October 1, 2006]*

Definitions

- .07 “Policy” includes a financial instrument which is substantively like a policy, such as a reinsurance agreement or an annuity contract, and includes a commitment to issue a policy.
- .08 “Policyholder” includes an individual insured under a group policy, a claimant, a beneficiary, an applicant for a policy, and a customer of a non-insurance service deemed to be a policy.
- .09 “Premiums” include income equivalent to premiums, such as management fees, and cost of insurance charges.

The insurer’s accounting policy

- .10 The preparers of the financial statements make a choice between going concern and wind-up accounting. The actuary would conform the valuation to that choice. If the actuary believes the choice to be inappropriate, then, after consultation with the auditor, he or she would so report. Going concern accounting is appropriate for an insurer that is expected to remain open to new business and in satisfactory financial position indefinitely. Going concern accounting is also appropriate for an insurer which is expected to become closed to new business, but to continue in a satisfactory financial position, either indefinitely or until an increase in capital, combination with another insurer in a satisfactory financial condition, or transfer of its policies to such an insurer brings financial relief.
- .11 Use of the terms “policy liabilities,” “premium liabilities,” and “claim liabilities” is desirable in financial statements, but the choice of their terminology and their itemisation is a management decision. What matters is that the actuary identify, value, and report on all the policy liabilities, whatever they may be called in the financial statements. The classification between premium and claim liabilities is usually evident but is in any case less important than assurance that **all** policy liabilities have been identified and valued.
- .12 Policy liabilities consist of premium liabilities and claim liabilities. Claim liabilities are those in respect of cash flow after the balance sheet date from benefits and claims incurred on or before that date, and their related expenses and taxes; i.e., all of the cash flow, excluding the portion paid before the balance sheet date. Premium liabilities are those in respect of all other cash flow; i.e., that from premiums, benefits, claims, and their related expenses and taxes, incurred after the balance sheet date.

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- .13 The policy liabilities reported in the insurer's balance sheet may be either net of the value of recoveries which are expected from reinsurance ceded or gross of that value. In the latter case, the value of the expected reinsurance recoveries is recorded as an asset. Fair presentation of the reported policy liabilities requires the amount of that asset to be appropriate. The recovery on account of reinsurance ceded would take account of not only the reinsurer's share of claims but also reinsurance commissions, allowances, and retrospective premium adjustments. [2140.01](#)
- .14 The policy liabilities reported in the insurer's balance sheet exclude deposit liabilities of segregated funds but include any related liabilities of the general fund, such as a liability for capital guarantees of amounts in segregated funds.
- .15 The insurer's accounting policy may report amounts related to the relevant policies and the assets which support their policy liabilities, such as
- deposit liabilities (for example, policyholder dividends on deposit),
 - incurred but unpaid items (for example, taxes incurred but not paid and policyholder dividends due but not paid),
 - future tax liabilities and assets (for example, those in connection with the timing differences between accounting and tax liabilities),
 - unamortized realized capital gains,
 - receivables from, payables to, and deposits by reinsurers,
 - the offset to gross liabilities on account of reinsurance ceded and retroceded,
 - amounts recoverable from policyholders,
 - asset impairment, and
 - deferred policy acquisition expenses,
- either as part of the policy liabilities or as separate items in the balance sheet or as a mixture of the two. The actuary would value the policy liabilities so that,
- in the aggregate, the policy liabilities and those separate items are consistent and avoid omission and double counting, and
 - the separate reporting of those items does not affect the insurer's capital (i.e., assets minus liabilities).
- .16 As respects consistency, the actuary would, for example, ensure that the policy liabilities
- provide for any risk of asset depreciation (C-1 risk) and of interest rate change (C-3 risk) for any deposit liabilities which the actuary did not value and which are separately reported without such provision, and
 - provide consistently for cash flow gross of reinsurance and reinsurance cash flow, except that reinsurance cash flow would also take account of the financial condition of the reinsurer.

- .17 As respects double counting and omission, the actuary would, for example, ensure that the same assets are not allocated twice to support liabilities, and provision for asset depreciation (C-1 risk) in valuing the policy liabilities does not duplicate any provision for asset depreciation deducted from the asset side of the balance sheet.

Relevant policies

- .18 The relevant policies for the valuation are those which are in force at the balance sheet date, including those whose issue is then committed, or which were in force earlier and which will generate cash flow after the balance sheet date. There are no policy liabilities in respect of other policies expected to be issued after that date, whether or not they are expected to be profitable.
- .19 There usually are both premium liabilities and claim liabilities in respect of policies which are in force at the balance sheet date.
- .20 There may be claim liabilities in respect of policies which are not in force at the balance sheet date as a result of outstanding claims incurred while they were in force. There may be premium liabilities in respect of those policies as a result of the right of policyholders to reinstate them, or of their unpaid retrospective premium, commission, and similar adjustments, experience rating refunds, reinsurance ceded, and subrogation and salvage.

Term of the Liabilities

- .21 The term of the liabilities of a property and casualty insurance policy ends at its expiry, which usually is within one year of the balance sheet date, unless for example the policy has been cancelled, in which case that term ends at the effective date of cancellation, or the contractual term of the policy exceeds one year; for example, an extended warranty policy which provides coverage for several years after expiry of the basic warranty.

Paragraphs 2320.16 through 2320.27 provide guidance on determination of the term of the liabilities of a life or health insurance policy.

[2320.16](#)
[2320.27](#)

Cash flow comprised in the policy liabilities

- .22 The policy liabilities in respect of a relevant policy comprise all of that policy's cash flow after the balance sheet date, except for cash flow from premiums, benefits, claims, expenses, and taxes which are **incurred** after the term of the policy's liabilities.
- .23 The tax cash flow is limited to that generated by premiums, benefits, claims, and expenses, and by the assets which support policy liabilities. The expense cash flow is limited to that generated by the relevant policies, including overhead allocations. The tax and expense cash flow exclude, for example, tax on investment income from, and the investment expense of, assets which support capital.
- .24 The comprised cash flow for a policy may extend beyond the term of its liabilities as a result of lag between incurral and the resultant cash flow. The extension may be prolonged, for example, for a claim payable in instalments under long term disability insurance, and a claim under product liability insurance which has a long settlement period.

Retrospective premium, commission, and similar adjustments

- .25 In determining the value of a contractual right of the insurer to future premiums which depend on past claims experience, the actuary would take account of credit risk of the policyholder.

Experience rating refunds

- .26 The liability for experience rating refunds would take account of
- the assumptions in calculating the policy liabilities in respect of those matters which determine experience rating refunds,
 - the difference between the basis for policy liabilities and the corresponding basis in the experience rating, and
 - any cross-rating across coverages in the experience rating.
- .27 The experience rating refund element of the policy liabilities would include provision for adverse deviations only for
- risk of misestimation (C-2 risk) of interest rates and risk of interest rate change (C-3 risk) and uncertainty in the calculation of the experience rating refund.

- .28 The experience rating refund element of the policy liabilities would not be negative except to the extent that in settlement it may be offset against another liability or recovered from policyholders.
- .29 Where an insurer holds an asset for an accrued experience rating deficit, the actuary would test the appropriateness and recoverability of the receivable amount using the valuation assumptions and methodology for experience rating refunds, and make an adjustment to the policy liabilities if necessary.

Reinsurance ceded and retroceded

- .30 The recovery on account of reinsurance ceded would take account of the financial condition of the reinsurer.
- .31 The actuary would assume that the insurer and the reinsurer each exercises its control over recapture, cancellation or commutation to its advantage.
- .32 The sign (positive or negative) of an assumption's margin for adverse deviations may depend on that assumption's effect on recapture, cancellation or commutation.

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Subrogation and salvage

- .33 The actuary would either net subrogation and salvage amounts against claims or value them as a separate item, depending on the insurer's accounting policy.

Exercise of policyholder options

- .34 Examples of policyholder options are
- the conversion of group insurance or individual term insurance,
 - the election of a settlement option in individual life insurance,
 - the purchase of additional insurance or coverage without underwriting, and
 - the selection of the amount of premiums for universal life insurance.

Deemed termination of remaining policies

- .35 The comprised cash flow in respect of a policy which is deemed to terminate at the end of the term of its liabilities would include any amount then payable by the insurer in the event of its termination, modified to take account of the fact that the termination is deemed and not actual. For example, the modification would
- forego a surrender charge deducted at an actual termination from the policy's account value to calculate its cash value,
 - forego a deduction at an actual termination from the policy's unearned premium to calculate its premium refund, and
 - anticipate a persistency bonus becoming payable at a date after the end of the term of the policy's liabilities if the policy remains in force to that date.

Time value of money

- .36 In this context, "supporting assets" means the insurer's assets and asset commitments which support its policy liabilities.
- .37 To take account of the time value of money is to express the year-by-year forecast of the cash flow comprised in the policy liabilities as an equivalent single amount at the balance sheet date. There are two methods of doing so – the Canadian asset liability method and the actuarial present value method. In the Canadian asset liability method, the amount of the policy liabilities is the amount of their supporting assets which reduce to zero at the last liability cash flow in the forecast of the cash flow from the assets and liabilities. The Canadian asset liability method is a "roll forward" method applicable to any scenario. The actuarial present value method is a "pull backward" method which produces the same result as the Canadian asset liability method for a particular scenario if present value factors, v^t , exist which replicate the investment return assumptions of that scenario. Such factors do not exist for complex scenarios; for example, a scenario which includes a spike in mortgage lending rates in forecast year 5. [2320](#)
- .38 The discount rates or the forecast of supporting assets, as the case may be, would take account of
- the supporting assets at the balance sheet date and the insurer's policy for asset-liability management after that date and/or
 - assumptions about investment return after the balance sheet date.

- .39 The actuary would value the policy liabilities so that, in the aggregate, they and the other policy-related items in the balance sheet take account of the time value of money.
- .40 In some cases, applicable regulation requires policy liabilities to be valued without taking account of the time value of money; i.e., to be valued as the sum of, rather than the present value of, the cash flow after the balance sheet date. For such a case, the actuary would make a dual valuation of policy liabilities:
- A in accordance with accepted actuarial practice, and
 - B in accordance with accepted actuarial practice but not taking account of the time value of money, with the provision for adverse deviations appropriately reduced.
- .41 If A is acceptable under the applicable regulation (which would usually be the case if A is greater than or equal to B), then the actuary would report A without reservation on account of the regulation.
- .42 If A is not acceptable under the applicable regulation (which would usually be the case if A is less than B), then the actuary would report B with reservation.

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Margin for adverse deviations

- .43 The margin for adverse deviations reflects the degree of uncertainty of the best estimate assumption. This uncertainty results from the risk of misestimation of and deterioration from the best estimate assumption. The potential for misestimation is greater when the past experience has been more volatile and hence would justify a greater margin. However, the margin for adverse deviations would be based on a forward-looking assessment of the expected experience and would not act as a mechanism to absorb changes in observed experience, such as changes caused by statistical fluctuations.

2140 REPORTING

- .01 *The actuary's report should describe*

the valuation and presentation of policy liabilities for the insurer's balance sheet and income statement,

the actuary's opinion on the appropriateness of those liabilities and on the fairness of their presentation, and

the actuary's role in the preparation of the insurer's financial statements if that role is not described in those statements or their accompanying management discussion and analysis.

.02 *If*
the financial statements (or their accompanying management discussion and analysis) describe the actuary's role in their preparation, and
the actuary can report without reservation,
then the actuary's report should conform to the standard reporting language, consisting of
a scope paragraph, which describes the actuary's work, and
an opinion paragraph, which gives the actuary's favourable opinion on the valuation and its presentation.

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[2140.17](#)

.03 *If not, the actuary should modify the standard reporting language to report with reservation.*
[Effective January 1, 2003]

Accounting in the balance sheet

.04 The amount of the policy liabilities is usually the largest amount in the balance sheet, so that its itemisation is desirable.

.05 The reference to "policy liabilities" in the standard reporting language is adequate if
the notes to the financial statements or their accompanying management discussion and analysis verbally define "policy liabilities", or
the balance sheet presents their total amount as a separate item.

Accounting in the income statement

.06 The standard reporting language implies that the income statement accounts for the total change in the policy liabilities during the accounting period. That accounting is direct in the case of a life insurer's actuarial liabilities, whose change is presented as a separate item in the income statement. That accounting is indirect in the case of other policy liabilities, because their change is not separately presented, but is included within other items in the income statement. For example, the item, incurred claims, equals

claims and claim expenses paid during the accounting period, plus

claim liabilities (which are part of the policy liabilities) at the end of the accounting period, minus

claim liabilities at the beginning of the accounting period.

Disclosure of unusual situations

- .07 The items that the actuary values for the financial statements may be misleading if the financial statements do not present them fairly. The actuary's report is a signal to the reader of the financial statements that there is, or is not, fair presentation.
- .08 In an unusual situation, fair presentation may require explanation of an item which the actuary values for the financial statements. Usually, the notes to the financial statements would provide that explanation, including, where appropriate, disclosure of the situation's effect on income and capital. Failing such explanation, the actuary would provide it by a reservation in reporting.
- .09 The question, "Will explanation enhance the user's understanding of the insurer's financial position?" may help the actuary to identify such a situation. Unusual situations may include
- capital appropriated on the actuary's advice,
 - off-balance-sheet obligations, for example, contingent policy liabilities in connection with market conduct,
 - restatement of items for preceding accounting periods,
 - the impracticality of restating any items which are reported in current period financial statements and which were reported inconsistently in preceding period financial statements, 1750.05
 - inconsistency among accounting periods, 1750.05
[2140.11](#)
 - an unusual relationship between the items in current period financial statements and the expected corresponding items in future period financial statements,
 - a change in the method of valuation which does not have an effect in the current accounting period but which is expected to have an effect in future accounting periods,
 - allocation of expense or investment income to a participating account (if reported in the financial statements) other than in accordance with the method approved by the actuary and the insurer's board of directors,
 - a subsequent event, and 1520
 - a difference between the insurer's present practice and that which the actuary assumed in valuing the policy liabilities.
- .10 An example of the last item is the actuary's assumption of a policy for setting dividend scales which differs from the insurer's current policy. The actuary would not, however, report the assumption of a dividend **scale** which is in accordance with an unchanged dividend **policy**. The same applies to a difference between current and assumed policy for setting non-guaranteed cash value scales and premium rates for adjustable policies.

Consistency among accounting periods

- .11 Financial statements usually report results for one or more preceding accounting periods in addition to those for the current period. Meaningful comparability requires the financial statement items for the various periods to be consistent through the restatement of preceding period items if they were inconsistently reported in the preceding period financial statements. A less desirable alternative to restatement is disclosure of the inconsistency.
- .12 A change in the method of valuation creates an inconsistency. If a change in the assumptions for valuation reflects a change in the expected outlook, then it does not create an inconsistency although, if its effect is major, then fair presentation may require its disclosure. 1750
- .13 A change in assumptions which results from the application of new standards may create an inconsistency.

Communication with the auditor

- .14 Communication with the auditor is desirable at various stages of the actuary's work. These include
- use of work in accordance with the *CIA/CICA Joint Policy Statement*, 1630
 - the drafting of common features in the auditor's report and actuary's report, 1520
 - the drafting of a report with reservations,
 - the presentation of the policy liabilities, and
 - the treatment of subsequent events.

Description of the actuary's role

- .15 The actuary would report a description of his or her role in the preparation of the insurer's financial statements only if the financial statements or their accompanying management discussion and analysis do not provide that description.

.16 Here is an illustrative description:

“The Appointed Actuary is

appointed by the [Board of Directors] of [the Company];

responsible for ensuring that the assumptions and methods for the valuation of policy liabilities are in accordance with accepted actuarial practice, applicable legislation, and associated regulations and directives;

required to provide an opinion on the appropriateness of the policy liabilities at the balance sheet date to meet all policyholder obligations of [the Company]. The work to form that opinion includes an examination of the sufficiency and reliability of policy data and an analysis of the ability of the assets to support the policy liabilities; and

required each year to analyse the financial condition of the company and prepare a report for the [Board of Directors]. The analysis tests the capital adequacy of the company until [31 December xxxx] under adverse economic and business conditions.”

Standard reporting language

.17 Here is the standard reporting language:

Appointed Actuary’s Report

To the policyholders [and shareholders] of [the ABC Insurance Company]:

I have valued the policy liabilities of [the Company] for its [consolidated] balance sheet at [31 December xxxx] and their change in the statement of income for the year then ended in accordance with accepted actuarial practice, including selection of appropriate assumptions and methods.

In my opinion, the amount of policy liabilities makes appropriate provision for all policyholder obligations and the [consolidated] financial statements fairly present the results of the valuation.

[Montréal, Québec]

[Report date]

[Mary F. Roe]

Fellow, Canadian Institute of Actuaries

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.18 The language in square brackets is variable and other language may be adjusted to conform to interim financial statements and to the terminology and presentation in the financial statements.

- .19 An auditor's report usually accompanies the financial statements. Uniformity of common features in the two reports will avoid confusion to readers of the financial statements. Those common features include:

Addressees. Usually, the actuary addresses the report to the policyholders of a mutual insurer and to both the policyholders and shareholders of a stock insurer.

Years referenced. Usually, the actuary's report refers only to the current year, even though financial statements usually present results for both the current and prior years.

Report date. If the two reports have the same date, then they would take account of the same subsequent events.

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Reservations in reporting

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- .20 The examples which follow are illustrative.

Quasi-insurer

- .21 Here is an example of a report for a quasi-insurer:

I have valued the outstanding claim liabilities of [the Professional Indemnity Plan] for its balance sheet at [31 December XXXX] in accordance with accepted actuarial practice, including selection of appropriate assumptions and methods.

As explained in Note [XX], the [Plan's] liabilities are not fully funded.

In my opinion, and having regard for Note [XX], the amount of policy liabilities makes appropriate provision for all of the [Plan's] outstanding claims and the financial statements fairly present the results of the valuation.

Note [XX] would quantify and describe the actuary's assumptions with respect to the asset shortfall, describe the plan, if any, for its funding, and explain its implications for the financial security of participants and claimants.

New appointment

- .22 A newly appointed actuary who is unable to use the predecessor actuary's work, but who has no reason to doubt its appropriateness, would modify the standard reporting language as follows:

I have valued the policy liabilities of [the Company] for its [consolidated] balance sheet at [31 December XXXX] and, except as noted in the following paragraph, their change in the statement of income for the year then ended in accordance with accepted actuarial practice, including selection of appropriate assumptions and methods.

I became the [appointed actuary] during the year and was unable to confirm the appropriateness of the valuation for the preceding year.

1610

In my opinion, the amount of policy liabilities makes appropriate provision for all policyholder obligations and the [consolidated] financial statements fairly present the results of the valuation. For the reason stated in the previous paragraph, I am unable to say whether or not those results are consistent with those for the preceding year.

- .23 If the actuary doubts the appropriateness of the predecessor actuary's work as a result of a review of it, then the actuary would consider a more serious reservation.

1640

Impracticality of restatement

- .24 The actuary would if necessary restate the preceding year valuation to be consistent with the current year valuation. If it is not practical to restate the preceding year valuation, then the actuary would modify the opinion paragraph in the standard reporting language as follows:

As explained in Note [XX], the method of valuation for the current year differs from that for the preceding year. In my opinion, except for that lack of consistency, the amount of policy liabilities makes appropriate provision for all policyholder obligations and the [consolidated] financial statements fairly present the results of the valuation.

- .25 Note [XX] would usually explain the change in the basis of valuation, explain the impracticality of applying the new basis retroactively, and disclose the effect of the change on the opening equity at the beginning of the preceding year.

Valuation does not take account of time value of money

- .26 If a regulation that policy liabilities be valued without taking account of the time value of money requires a reservation, then the actuary would modify the standard reporting language as follows:

I have valued the policy liabilities of [the Company] for its [consolidated] balance sheet at [31 December xxxx] and their change in the statement of income for the year then ended in accordance with accepted actuarial practice, including the selection of appropriate assumptions and methods, except as described in the following paragraph.

In accepted actuarial practice, the valuation of policy liabilities reflects the time value of money. Pursuant to the authority granted by the *Insurance Companies Act*, the Superintendent of Financial Institutions has directed that the valuation of some policy liabilities not reflect the time value of money. My valuation complies with that directive.

In my opinion, the amount of policy liabilities makes appropriate provision for all policyholder obligations, except as noted in the previous paragraph, and the [consolidated] financial statements fairly present the results of the valuation.

Takeover of insurer with poor records

- .27 If the insurer took over another insurer with poor records, then the actuary would modify the standard reporting language as follows:

I have valued the policy liabilities of [the Company] for its [consolidated] balance sheet at [31 December xxxx] and their change in the statement of income for the year then ended in accordance with accepted actuarial practice, including selection of appropriate assumptions and methods, except as described in the following paragraph.

During the year, [the Company] took over the assets, liabilities, and policies of [WWW Insurer], whose policy records are, in my opinion, unreliable. [The Company] is making but has not completed the necessary improvements. My valuation with respect to the policies taken over from [WWW Insurer] is therefore uncertain. Their policy liabilities comprise [N]% of the total policy liabilities at [31 December xxxx].

In my opinion, except for the reservation in the previous paragraph, the amount of policy liabilities makes appropriate provision for all policyholder obligations and the [consolidated] financial statements fairly present the results of the valuation.

Liabilities greater than those calculated by the actuary

- .28 If the financial statements of an insurer report policy liabilities which are greater than those calculated and reported by the actuary, and if the notes to those financial statements do not provide sufficient disclosure of the rationale for the greater liabilities, then the actuary would report as follows:

I have valued the policy liabilities of [the Company] for its [consolidated] balance sheet at [31 December XXXX] and their change in the statement of income for the year then ended in accordance with accepted actuarial practice, including selection of appropriate assumptions and methods, except as described in the following paragraph.

In my valuation, the amount of the policy liabilities is \$[X]. The corresponding amount in the [consolidated] financial statements is \$[Y].

In my opinion, the amount of policy liabilities of \$[X] makes appropriate provision for all policyholder obligations and, except as described in the preceding paragraph, the [consolidated] financial statements fairly present the result of the valuation.

2200 VALUATION OF POLICY LIABILITIES: P&C INSURANCE

2210 SCOPE

- .01 The standards in this section 2200 apply in accordance with subsections 2110 and 2120.
- .02 Repealed

2110

2220 CLAIM LIABILITIES

- .01 *The amount of the claim liabilities should be equal to the present value, at the balance sheet date, of cash flow on account of claims (and of related expenses and taxes) incurred before that date. [Effective January 1, 2003]*
- .02 The amount of claim liabilities consists of the following components
- the amount of the case estimates,
 - a provision (which may be positive or negative) for development on reported claims, including claim adjustment expenses, and
 - a provision for incurred but unreported claims, including claim adjustment expenses.
- .03 The development on reported claims compensates for the inadequacy or redundancy in case estimates.
- .04 The incurred but unreported claims are those not yet reported to the insurer, including those reported but not yet recorded.
- .05 The development on reported claims and the incurred but unreported claims need not be calculated separately. Some valuation methods calculate only their combined amount.
- .06 The selection of valuation methods depends on the circumstances of the case. The actuary would usually consider several methods, each of which involves assumptions; e.g., an assumption that the settlement patterns of the available past claims experience are uniform and the same as those of the insurer's future claims experience. The actuary would where practical adjust the available past claims experience in order to recognize those assumptions.

.07 The actuary would consider the circumstances of the case in selecting assumptions. The available past claims experience may lack pertinence for assumptions about the insurer's future claims experience as a result of internal changes, such as changes in

- the insurer's underwriting practice,
- its claims handling practice, including case estimate practice,
- its reinsurance,
- its data processing, and
- its accounting,

and as a result of external changes, such as inflation and changes in the judicial, regulatory, and legislative environment, or residual insurers, like the Facility Association.

1730.08
1730.10
1730.17

.08 The past and future claims experience of a pool or association in which the insurer participates tends to be beyond the insurer's control and may differ from the insurer's own claims experience.

2230 PREMIUM LIABILITIES{TC "PREMIUM LIABILITIES " \L 2}

.01 *The amount of the premium liabilities (after deducting any deferred policy acquisition expense asset) should be equal to the present value, at the balance sheet date, of cash flow on account of premium development and of the claims, expenses, and taxes to be incurred after that date on account of the policies in force at that date or an earlier date. [Effective January 1, 2003]*

[2130.03](#)

.02 The actuary would consider the standards for claim liabilities in selecting assumptions about claims.

.03 Expenses include both claim adjustment expenses and the expense of servicing policies.

.04 Premium development includes additional premiums such as reinstatement premiums and provisions for swing-rated policies.

2240 PRESENT VALUES

.01 The expected investment return rate for calculation of the present value of cash flow is that to be earned on the assets which support the policy liabilities. It depends on

- the method of valuing assets and reporting investment income,
- the allocation of those assets and that income among lines of business,
- the return on the assets at the balance sheet date,
- the yield on assets acquired after the balance sheet date,
- the capital gains and losses on assets sold after the balance sheet date, and
- investment expenses, and losses from default (C-1 risk).

- .02 The actuary need not verify the existence and ownership of the assets at the balance sheet date, but would consider their quality.

2250 MARGIN FOR ADVERSE DEVIATIONS {TC "MARGIN FOR ADVERSE DEVIATIONS " \L 2}

- .01 The standards in this subsection 2250 apply to the selection of a margin for adverse deviations in the assumptions for a valuation of policy liabilities by a single scenario valuation.

1740.39

- .02 *The actuary should select a margin for adverse deviations for an assumption which is within the range defined by the low margin and the high margin for that assumption. The criteria for selection of that margin are the considerations for that assumption.*

[2250.10](#)

- .03 *The selected margin should tend toward the high margin to the extent that those considerations, viewed in the aggregate but considering their individual relative importance,*

have been unstable during the period covered by the experience data on which the selection of the corresponding expected assumption is based and the effect of that instability cannot be quantified, or

otherwise undermine confidence in the selection of the corresponding expected assumption,

and should tend toward the low margin to the extent that the opposite is the case.

- .04 *The selected margin should vary*

between premium liabilities and claim liabilities,

among lines of business, and

among accident years, policy years, or underwriting years, as the case may be,

according to how those considerations so vary. [Effective January 1, 2003]

Assumptions subject to margin

- .05 The actuary would include margin in the assumptions for
- claims development,
 - recovery from reinsurance ceded, and
 - investment return rates.

- .06 The actuary would not usually include margin in the other assumptions. An example of unusual circumstances which warrants an exception is:

Salvage and subrogation assumption: Presentation as an asset separate from the claim liabilities.

Amounts of high and low margins

- .07 The margin for claims development is a percentage of the claim liabilities excluding provision for adverse deviations.
- .08 The margin for recovery from reinsurance ceded is a percentage of the amount deducted on account of reinsurance ceded in calculating the premium liabilities or claim liabilities, as the case may be, without provision for adverse deviations.
- .09 The margin for investment return rate is a deduction from the expected investment return rate per year.
- .10 The amounts of margin are:
- | | <u>High</u> | <u>Low</u> |
|--|------------------|-----------------|
| <u>Claims development</u> | 15% | 2.5% |
| <u>Recovery from reinsurance ceded</u> | 15% | Zero |
| <u>Investment return rates</u> | 200 basis points | 50 basis points |
- .11 Selection of a margin for adverse deviations above the high margin may be appropriate for unusually high uncertainty – for example, during the transition to new insurance coverages.

Considerations

- .12 A consideration for an assumption generates lack of confidence in that assumption as a result of past or future instability of the consideration or a shortcoming in its quality, quantity, or performance. For example,
- Instability in the guidelines for setting and reviewing case estimates may result in inconsistent development among accident years, and
- A history of claim and coverage disputes with a reinsurer creates uncertainty of recovery of 100¢ in each dollar of the reinsurer's share of liabilities.
- .13 The actuary would select and evaluate considerations for each assumption which are appropriate to the circumstances of the insurer, including
- insurer practices, for example, the guidelines for setting and reviewing case estimates,
- data, for example, the stability of claims frequency and average claim cost,
- reinsurance, for example, the history of claim and coverage disputes with reinsurers,
- investments, for example, the matching of assets and liabilities, and
- the external environment, for example, the effect of regulatory change on claim settlements.

**2300 VALUATION OF POLICY LIABILITIES: LIFE AND HEALTH
(ACCIDENT AND SICKNESS) INSURANCE**

2310 SCOPE

- .01 The standards in this section 2300 apply in accordance with subsections 2110 and 2120.

[2110](#)

2320 METHOD

- .01 *The actuary should calculate policy liabilities by the Canadian asset liability method.*
- .02 *The amount of policy liabilities by that method for a particular scenario is equal to the amount of supporting assets at the balance sheet date which are forecasted to reduce to zero at the last liability cash flow in that scenario.*

[2130.37](#)

- .03 The term of the liabilities should take account of any renewal, or any adjustment equivalent to renewal, after the balance sheet date if

[2320.16](#)

the insurer's discretion at that renewal or adjustment is contractually constrained, and

policy liabilities are larger as a result of taking account of that renewal or adjustment.

- .04 *In forecasting the cash flow which the policy liabilities comprise, the actuary should*

[2130.05](#)

take account of policyholder reasonable expectations, and

include policyholder dividends, other than the related transfers to the shareholders account and other than ownership dividends, in the comprised cash flow from benefits.

- .05 The actuary should calculate policy liabilities for multiple scenarios and adopt a scenario whose policy liabilities make sufficient but not excessive provision for the insurer's obligations in respect of the relevant policies.

1740.04

- .06 *The assumptions for a particular scenario consist of*

scenario-tested assumptions, which should include no margin for adverse deviations, and

each other needed assumption, whose best estimate should be consistent with the scenario-tested assumptions and which should include margin for adverse deviations.

- .07 *The scenario-tested assumptions should include at least the interest rate assumptions.*

- .08 The scenarios of interest rate assumptions should comprise
- a base scenario, as defined under paragraph 2330.09.1,*
 - each of the prescribed scenarios in a deterministic application,*
 - ranges which comprehend each of the prescribed scenarios in a stochastic application, and*
 - other scenarios appropriate for the circumstances of the insurer.*
- [Effective October 15, 2006]

Liability grouping and asset segmentation

- .09 The actuary would usually apply the Canadian asset liability method to policies in groups which reflect the insurer's asset-liability management practice for allocation of assets to liabilities and investment strategy. That application is a convenience, however, which would not militate against calculation of policy liabilities that, in the aggregate, reflect the risks to which the insurer is exposed.

Other methods

- .10 For a particular scenario, another method may be equivalent to or approximate the Canadian asset liability method. If the actuary uses that other method, then the calculation for multiple scenarios and the selection of one which makes sufficient but not excessive provision for the insurer's obligations would be the same as for the Canadian asset liability method.

Supporting assets

- .11 In allocating assets to support liabilities, the actuary would preserve the connection between unamortized capital gains, both realized and unrealized, and the asset segments which generated them.
- .12 The value of the assets which support policy liabilities at the balance sheet date would be their value in the insurer's financial statements; i.e., book value, taking account of accrued investment income and of adjustments for impairment, amortized unrealized capital gains, and amortized realized capital gains.
- .13 The forecasted cash flow of the assets would take account of any related, off-balance sheet, financial instruments.
- .14 The forecast of cash flow from taxes would take account of permanent and temporary differences between the amortization of capital gains in accordance with generally accepted accounting principles and in accordance with tax law.

- .15 The assumed cash flow from policyholder dividends would avoid omission and double counting. For example, if the dividend scale includes distribution of a deferred realized capital gain (net of any corresponding future tax asset), then the assumed cash flow from policyholder dividends would exclude that distribution. In the opposite case, the assumed cash flow from policyholder dividends would provide for negative distribution of a deferred realized capital loss asset (net of any corresponding future tax liability). Such avoidance is appropriate only in the case of liabilities and would not be appropriate if the dividend scale included distribution of assets that support capital, or distribution of investment income on assets that support capital.

[2320.35](#)

Term of the liabilities

- .16 If an element of a policy operates independently of the other elements, then it would be treated as a separate policy with its own term of liabilities. Examples are

a flexible premium deferred annuity where the interest guarantee and cash value attached to each premium are independent of those for the other premiums, and

a certificate of voluntary non-contributory association or creditor group insurance.

- .17 The term of a policy's liabilities is not necessarily the same as the contractual term of the policy.

- .18 In this context,

“renewal” means the renewal of a policy at the end of its term, with the insurer having discretion to adjust premiums or coverage for the new term,

“adjustment” means an insurer's adjustment to a policy's coverage or premiums equivalent to that in a renewal, and

“constraint” means a constraint on the insurer's exercise of discretion in renewal or adjustment which results from contractual obligations, legally binding commitments,

[2320.28](#)

and policyholder reasonable expectations. Examples of constraint are an obligation to renew a policy unless renewal is refused for all other policies in the same class, a guarantee of premiums, a guarantee of credited interest rate, a general account guarantee of segregated fund value, and a limitation on the amount of adjustment. “Constraint” would not include a price-competitive market expected at renewal or adjustment.

- .19 The term of a policy's liabilities takes account of all renewals and adjustments before the balance sheet date. Depending on the circumstances, that term may also take account of one or more renewals or adjustments after the balance sheet date.

- .20 If the term of the liabilities is not evident, and if selection of a longer term would reduce policy liabilities, then the actuary would be cautious in making such a selection. On the other hand, if selection of a longer term would increase those liabilities, then the actuary would usually select the longer term. Substance would supersede form in the selection; for example, a universal life policy which is in form an annual premium life insurance policy may be in substance a single premium deferred annuity.
- .21 The term of the liabilities of
- a policy which has been cancelled by the insurer ends at the effective date of cancellation.
 - a policy which has not been cancelled, but which is cancellable by the insurer at or before the date to which its premiums have been paid, ends at that date.
 - an individual annual premium life or accident and sickness insurance policy ends at the last day to which the policyholder may prolong its coverage without the consent of the insurer.
 - a certificate of group insurance if the group policy is in effect a collection of individual policies is the same as if it were an individual policy, unless contributions or experience rating of the group negate anti-selection by certificate holders.
- .22 The term of the liabilities of any other policy ends at the earlier of
- the first renewal or adjustment date at or after the balance sheet date at which there is no constraint, and
 - the renewal or adjustment date after the balance sheet date which maximizes the policy liabilities.
- .23 The actuary would extend such term solely to permit recognition of cash flow to offset acquisition or similar expenses
- whose recovery from cash flow that would otherwise be beyond such term was contemplated by the insurer in pricing the policy, and
 - where the value of the additional cash flow recognized by such extension of the term cannot exceed the value of the remaining balance of acquisition or similar expenses.

- .24 The balance of acquisition or similar expenses would be written down to zero using an appropriate method. Such method would:
- have a term consistent with the extended term established at inception,
 - have a write-down pattern reasonably matched with the net cash flow available to offset these expenses at inception, and
 - be locked in, so the amount of write-down in each period will not fluctuate from the expected amount established at inception provided such balance is recoverable from the additional cash flow recognized at the balance sheet date, and where not fully recoverable at the balance sheet date, is written down to the recoverable amount, with the expected amount of write-down in each future period proportionately reduced.
- .25 That implies that the term ends at
- the balance sheet date if the policy is continually renewable or adjustable without constraint,
 - the first renewal or adjustment after the balance sheet date if there is no constraint at that renewal or adjustment, and
 - a renewal or adjustment determined by testing for any other policy. The actuary would calculate the policy liabilities assuming that the term of its liabilities ends at each renewal or adjustment at or after the balance sheet date up to and including the first renewal or adjustment at which there is no constraint, and would select the term corresponding to the largest policy liabilities.
- .26 A change in the outlook may provoke a change in the term of a policy's liabilities. For example, the constraint of a cost of insurance guarantee which previously lengthened the term of the policy's liabilities may no longer do so if the outlook for mortality improves. On the other hand, the constraint of a guaranteed credited interest rate which previously was considered innocuous may become meaningful, and thereby lengthen the term of the policy's liabilities, if the outlook changes to one of lower interest rates.

- .27 For example, the term of the liabilities ends at
- the balance sheet date for a daily interest rate deposit without minimum guarantee, an administrative services only (ASO) contract without expense guarantee, and the general account portion of a deferred annuity with segregated fund liabilities but without guarantees; for example, with no guarantee of the segregated fund value,
 - the first renewal of a single premium deferred annuity which is, in effect, a term deposit (i.e., having a credited interest rate guarantee for a stipulated period, say three years, beginning at the date of deposit, and no guarantee thereafter),
 - the first renewal (usually one year after the previous renewal) of a group policy which insures employee benefits, unless there is a constraint at that renewal, and
 - the next renewal date or adjustment date even if there is a constraint at renewals and adjustments at and after that date, but the constraint is so weak that its operation does not increase policy liabilities.

Policyholder reasonable expectations

- .28 The insurer's policies define contractually its obligations to its policyholders. The contractual definition may leave certain matters to the insurer's discretion, such as
- the determination of policyholder dividends, experience-rating refunds, and retrospective commission adjustments, and
 - the right to adjust premiums.
- .29 Matters left to the insurer's discretion implicitly include
- underwriting and claim practices, and
 - the right to waive contractual rights and to create extra-contractual obligations.
- .30 Policyholder reasonable expectations are the expectations which
- may be imputed to policyholders as their reasonable expectations of the insurer's exercise of discretion in those matters, and
 - arise from the insurer's communication in marketing and administration, from its past practice, from its current policy, and from general standards of market conduct. Past practice includes the non-exercise of discretion; for example, long non-exercise without affirmation of a right to adjust premiums may undermine it. The insurer's communication includes policyholder dividend and investment performance illustrations at sale of a policy and that of intermediaries reasonably perceived as acting in its behalf.

- .31 In selecting assumptions for the insurer's exercise of discretion in those matters, the actuary would take policyholder reasonable expectations into account. Taking account of policyholder reasonable expectations may affect not only the amount of policy liabilities but also disclosure in the financial statements.
- .32 The determination of policyholder reasonable expectations is straightforward when the insurer's practice has been clear, unvarying, consistent with its communications, consistent with general standards of market conduct, and the insurer does not intend to change it. The actuary would discuss any other practice with the insurer, with a view to clarifying policyholder reasonable expectations.
- .33 If the insurer makes a change which will eventually alter policyholder reasonable expectations, then the actuary would consider both the appropriate disclosure of the change in policyholder communication and the financial statements, and the time elapsed before the altered expectations crystallize.
- .34 A dispute over policyholder reasonable expectations may lead to class action or other litigation by policyholders against the insurer, which may affect policy liabilities or generate contingent liabilities.

Policyholder dividends

- .35 The assumed cash flow from policyholder dividends would be that from both periodic (usually annual) dividends and terminal and other deferred dividends, but excluding that from the related transfers from the participating to the shareholders account in a stock insurer.
- .36 The assumed cash flow from policyholder dividends would avoid omission and double counting with other elements of the policy liabilities and with liabilities other than policy liabilities. For example, if the actuary has valued the policy liabilities for riders and supplementary benefits in participating policies as though they were non-participating—i.e., with provision for adverse deviations in excess of that appropriate for participating insurance – then the assumed cash flow from policyholder dividends would exclude the portion of that excess which is included in the dividend scale.
- .37 The selected policyholder dividend scales in a particular scenario would be consistent with the other elements of that scenario, but would take account of how insurer inertia, policyholder reasonable expectations, and market pressure may preclude the dividend scale from being responsive to changes assumed in the scenario. Those scales would also be consistent with the insurer's dividend policy except in a scenario which that policy does not contemplate and which would provoke a change in it.
- .38 If the current dividend scale anticipates a future deterioration in experience, then the actuary would assume continuance of that scale in response to that deterioration. If the current dividend scale does not respond to a recent deterioration in experience but the insurer's policy is to do so, and if the delay in doing so does not provoke a contrary policyholder reasonable expectation, then the actuary would assume such response.

- .39 An assumption of cash dividends to all policyholders is appropriate only if the alternative options to cash have equivalent value, failing which the actuary would
- either adjust the cash dividends to reflect the non-equivalence or make explicit assumption about policyholder exercise of the various dividend options, and
 - provide for the anti-selection which will result from increasing exercise of the more valuable options.

Forecast of cash flow

- .40 In calculating policy liabilities, the actuary would allocate assets to the liabilities at the balance sheet date, forecast their cash flow after that date, and, by trial and error, adjust the allocated assets so that they reduce to zero at the last cash flow.
- .41 Use of the work of another person may be appropriate for forecasting the cash flow of certain assets, such as real estate. 1610

Income tax and alternative tax

- .42 This item deals with cash flow from tax based on income (herein called “income tax”) and other taxes not based on income but which interact with income tax; for example, certain capital taxes in Canada (herein called “alternative tax”).
- .43 The cash flow from such taxes would be limited to that in respect of the relevant policies and the assets which support their policy liabilities, and thus, with the exception of the recoverability of future tax losses described below would ignore any interaction between that cash flow and cash flow in the rest of the insurer; e.g., it would ignore tax on investment income from assets which support the insurer’s capital. For a particular scenario, forecasted income before tax is equal to zero in each accounting period after the balance sheet date. That is so because that scenario assumes occurrence of the adverse deviations for which it makes provision. If income according to tax rules were equal to income in accordance with generally accepted accounting principles, and if there were no alternative tax, then the corresponding forecasted tax cash flow would also be equal to zero. In reality, however, such tax cash flow may differ from zero because of
- differences—both temporary and permanent—between income in accordance with generally accepted accounting principles and in income in accordance with tax rules,
 - the operation of carry-forward and carry-back in the tax rules, and
 - alternative tax and the interaction between it and income tax.
- .44 An example of a temporary difference is a difference between policy liabilities and the corresponding tax liabilities.

[2320.40](#)

- .45 An example of a permanent difference is a preferential tax rate on the investment income on a class of assets.
- .46 The forecast of cash flow from such taxes would therefore take account of positive or negative tax as a result of permanent and temporary differences at, and arising after, the balance sheet date, and of alternative taxes incurred after the balance sheet date.
- .47 The resulting policy liabilities make appropriate provision for cash flow on account of such taxes. If the insurer's balance sheet records a future tax asset or liability in respect of such taxes, then, in order to avoid double counting, the actuary would adjust the policy liabilities otherwise calculated upward to reflect the existence of the future tax asset and downward to reflect the existence of future tax liability.
- .48 The realization of negative tax depends on the simultaneous availability of income which is otherwise taxable. In forecasting such income, the actuary would [2320.43](#)
make provision for adverse deviations,
take into account the projected tax position of the company overall, but
not take account of the expected release of provisions for adverse deviations in the policy liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

Adverse deviations borne by policyholders

- .49 The policy liabilities need not make provision for adverse deviations to the extent that the insurer can offset its effect by adjustments to policyholder dividends, premium rates, and benefits. The insurer's contractual right of such offset may be constrained by policyholder reasonable expectations, competition, regulation, administrative delays, and the fear of adverse publicity or anti-selection. [1740.12](#)
[1740.24](#)

Adoption of a scenario

- .50 If the selection of scenarios is deterministic, then the actuary would adopt a scenario whose policy liabilities are within the upper part of the range of the policy liabilities for the selected scenarios, provided, however, that the policy liabilities would not be less than those in the prescribed scenario with the largest policy liabilities.
- .51 If the selection of scenarios is stochastic, then the actuary would adopt a scenario whose policy liabilities are within the range defined by
the average of the policy liabilities which are above the 60th percentile of the range of policy liabilities for the selected scenarios, and
the corresponding average for the 80th percentile.

Scenario-tested assumptions

- .52 The provision for adverse deviations in respect of scenario-tested assumptions results from calculating the policy liabilities for multiple scenarios and adopting a scenario whose policy liabilities are relatively high. 1740.21

Other assumptions

- .53 The provision for adverse deviations in respect of each assumption other than the scenario-tested assumptions results from a margin for adverse deviations included in that assumption.
- .54 The assumptions unique to a particular scenario are the scenario-tested assumptions and each other assumption which is correlated with them. For example, policyholder dividends and the exercise of options by borrowers and issuers are strongly correlated with interest rates. Lapses may be correlated or not, depending on the circumstances. The assumption on a matter not so correlated would be common to all scenarios. 1740.39

Margin for adverse deviations

- .55 The margin for adverse deviations would be at least the average of the applicable high and low margin whenever at least one 'significant consideration' exists, or at least one other consideration is significant in the context of the valuation. Significant considerations vary by type of assumption and are described under subsections 2340 and 2350.

2330 SCENARIO ASSUMPTIONS: INTEREST RATES

General Considerations

- .01 An interest rate scenario comprises, for each forecast period between the balance sheet date and the last cash flow,
 an investment strategy, and
 an interest rate for each risk-free asset and the corresponding premium for each asset subject to default.
- .02 Each interest rate scenario would include an assumption with respect to the rate of inflation that is consistent with that scenario.
- .03 The interest rate scenario would be consistent among the insurer's lines of business.
- .04 The investment strategy defines reinvestment and disinvestment practice for each type, default risk classification, and term of the invested assets which support policy liabilities. Assumption of the insurer's current investment strategy implies investment decisions of reinvestment and disinvestment in accordance with that strategy and hence the risk inherent in that strategy.

- .05 The investment strategy for each scenario would be consistent with the insurer's current investment policy. The policy liabilities would therefore make no provision for any increased risk which may result from a change in that policy.
- .06 When using non-debt instruments, the actuary would ensure that the proportion of non-debt instruments, at each duration, would be in accordance with the insurer's current investment policy (regardless of whether net cash flows for the period are positive or negative). This review would be performed without taking into consideration any business that could be issued after the valuation date (new sales) even for a valuation done on a going concern basis as stipulated in paragraph 2130.02. In the case where the investment policy limits are set on a going concern basis, the actuary would be satisfied that the projected proportion of non-debt assets is appropriate to support only the in-force business at the valuation date, and does not explicitly or implicitly assume any future new business. This may create a situation where the actuary would have to assume that non-debt instruments would be divested. This disinvestment is not limited to non-debt instruments acquired after the valuation date.
- .07 The number of assumed terms of assets would be large enough to permit assumption of changes in the shape and steepness of the yield curve. That implies a minimum of a short, a medium, and a long term.
- .08 A scenario for a foreign country's interest rates would be formulated independently of that for Canadian interest rates unless their positive historical correlation is expected to continue.
- .09 The importance of the assumptions for a particular forecast period depends on the magnitude of the net forecasted cash flow for that period.

Base Scenario

- 09.1 The interest rates for investments purchased or sold are based on the following interest rate scenario using the insurer's current investment strategy:

risk-free interest rates effective after the balance sheet date are equal to the forward interest rates implied by the equilibrium risk free market curve at that date, for the first 20 years after the balance sheet date;

at or after the 40th anniversary from the balance sheet date, risk-free interest rates are equal to the sum of ½ of the 60 month and 120 month moving averages of historic long-term Canadian risk-free bond yields (V122544 term-to-maturity>10 years), annualized and rounded to the nearest 10 basis points;

between the 20th and 40th anniversary, the forward risk-free interest rates are determined using a uniform transition; and

the premiums for default risk at all durations, consistent with the current investment strategy and risk premiums available in the market at the balance sheet date.

- .09.2 The provision for adverse deviations for interest rate risk for both deterministic and stochastic applications would be measured as the difference between the reported policy liabilities and the policy liability resulting from the application of the Base Scenario.

Prescribed scenarios

- .10 Because future investment returns and inflation rates are so conjectural, it is desirable that the calculation of policy liabilities for all insurers take account of certain common assumptions. There are therefore nine prescribed scenarios which follow.

- .11 The prescribed scenarios apply to debt investments acquired or sold after the balance sheet date.

- .12 For a prescribed scenario, if the net cash flow forecast for a period is positive, then the actuary would assume its application to repay the outstanding balance, if any, of borrowing in accordance with paragraph 2330.14, and then

assume the reinvestment of any remainder in debt investments,

except that, in lieu of debt investments, the actuary may assume reinvestment in non-debt investments

not to exceed their proportion of investments at the balance sheet date if the insurer controls investment decisions and if such reinvestment is consistent with its investment policy, or

in the proportion expected to be selected by policyholders if policyholders control investment decisions.

- .13 The limitation on reinvestment in non-debt instruments is intended to apply in situations where reflecting increased utilization of these instruments would reduce the policy liabilities.

- .14 For a prescribed scenario, if the net cash flow for a period is negative, then the actuary would assume an offsetting disinvestment or borrowing, or a mix of the two. For insurer controlled investment decisions, any borrowing would be in accordance with the investment policy, would be short term, and would be expected to be soon repayable by subsequent positive forecasted net cash flow.

- .15 The prescribed scenarios provide guidance on interest rates for sale and purchase of investments and on the type and term of investments purchased, but provide no guidance on the type and term of investments sold.

- .15.1 The prescribed range of short-term Canadian risk-free interest rates for the ultimate forecast period is calculated as follows (but see also paragraph 2330.153 below for limitations). The lower bound of the short-term rates is determined as the lesser of 3%, and the rate determined by taking 90% of the sum of 1/2 of the 60 month and 120 month moving averages of historic 91-day Canadian risk-free interest rates. The upper bound of the short-term rates is determined as the greater of 10%, and 110% of the sum of 1/2 of the 60 month and 120 month moving averages of historic 91 day Canadian risk-free rates. These range bounds are rounded to the nearest 10 basis points. The 91 day Canadian risk-free interest rate is defined as the effective annual rate equivalent to the Short Rate: V122531 - Government of Canada 91 Day Treasury Bill Yield rate which is compounded quarterly.
- .15.2 The prescribed range of long-term Canadian risk-free interest rates for the ultimate forecast period is calculated as follows (but see also paragraph 2330.153 below for limitations). The lower bound of the long-term rates is determined as the lesser of 5%, and the rate determined by taking 90% of the sum of 1/2 of the 60 month and 120 month moving averages of historic long-term Canadian risk-free bond interest rates (term-to-maturity >10 years). The upper bound of the long-term rates is determined as the greater of 12%, and 110% of the sum of 1/2 of the 60 month and 120 month moving averages of historic long-term Canadian risk-free bond interest rates (term-to-maturity >10 years). These range bounds are rounded to the nearest 10 basis points. The long-term Canadian risk-free bond interest rate (term-to-maturity >10 years) is defined as the effective annual rate equivalent to the Long Rate: V122544 - Government of Canada Benchmark Bond Yield – Long Term rate which is compounded semi-annually.
- .15.3 The width of the prescribed range of interest rates is exactly 7%. As a result, if the lower bound of the range is below 3% (short-term) or 5% (long-term), the upper bound of the range will be adjusted to be exactly 7% larger than the lower bound. Similarly, if the upper bound of the range is above 10% (short-term) or 12% (long-term), the lower bound of the range will be adjusted to be exactly 7% less than the upper bound.
- .16 The parameters in the prescribed scenarios apply to investments denominated in Canadian dollars. For each prescribed scenario, the actuary would determine the corresponding parameters for investments denominated in a foreign currency from the historical relationship between investments denominated in that currency and investments denominated in the Canadian dollar if the expected continuance of that relationship so permits. Otherwise the actuary would devise independent scenarios for investments denominated in that currency.

- .17 For each of prescribed scenarios 1 to 6 the insurer's reinvestment strategy for debt instruments by type and term

at the balance sheet date is the distribution which the insurer is then purchasing,

at and after the 20th anniversary of the balance sheet date is risk-free coupon bonds with a term of 20 -years or less, and

between those two dates is according to a uniform transition from the balance sheet date distribution to risk-free coupon bonds with a term of 20 years or less.

Prescribed scenario 1

- .18 The risk-free interest rates for investments purchased or sold

at the balance sheet date are those for the distribution of investments which the insurer is then making,

at the first anniversary from the balance sheet date are 90% of the risk-free rates at the balance sheet date,

at and after the 20th anniversary of the balance sheet date are the lower bounds of the short-term and long-term rates as described in paragraphs 2330.15.1 through 2330.15.3, and

between the last two dates are determined according to a uniform transition from the first anniversary rates to the lower bounds of the prescribed range.

Interest rates between the short-term and long-term bounds are determined using yield rates that are appropriate for the terms of those assets, in accordance with the historic relationship between the rates of those assets and the short-term and long-term interest rates.

Prescribed scenario 2

- .19 This scenario is the same as prescribed scenario 1, with the 90% replaced by 110% and with the short-term lower bound replaced by the short-term upper bound and the long-term lower bound replaced by the long-term upper bound.

Prescribed scenario 3

- .20 The long-term risk-free interest rate moves cyclically in 1% steps between the long-term lower and upper bounds of the prescribed range determined in paragraphs 2330.15.1 through 2330.15.3. The first cycle is irregular; at the first anniversary of the balance sheet date, the rate is

the next step higher, such that the interest rate is an integral difference from the bounds of the range, if the actual rate at the balance sheet date is less than the long-term upper bound, with the rate at subsequent anniversaries increasing in 1% steps to the long-term upper bound, at which point the cycle continues regularly, and

the next step lower, such that the interest rate is an integral difference from the bounds of the range, if the actual rate at the balance sheet date is equal to or greater than the long-term upper bound, with the rate at subsequent anniversaries decreasing in 1% steps to the long-term upper bound, at which point the cycle continues regularly.

- .21 The short-term risk-free interest rate changes uniformly over a period, usually not more than three years, from that at the balance sheet date to 60% of the corresponding long-term interest rate, and thereafter remains at 60% of the corresponding long-term interest rate.
- .22 Other interest rates are determined using yield rates that are appropriate for the terms of those assets, in accordance with the historic relationship between the rates of those assets and the short and long-term interest rates.

Prescribed scenario 4

- .23 This scenario is the same as prescribed scenario 3, except that the first irregular cycle reaches the long-term lower bound rather than the long-term upper bound.

Prescribed scenario 5

- .24 This scenario is the same as prescribed scenario 3, except that the short-term interest rate at an anniversary of the balance sheet date is a percentage of the corresponding long-term interest rate. That percentage moves cyclically in 20% annual steps from 40% to 120% and back. The first cycle is irregular; at the first anniversary, the percentage is

the next step above the actual percentage at the balance sheet date if that actual percentage is less than 120%, and

120% otherwise,

after which the cycle continues regularly.

Prescribed scenario 6

- .25 As respects long-term interest rate, this scenario is the same as prescribed scenario 4.
- .26 As respects short-term interest rate, this scenario is the same as prescribed scenario 5, except that, at the first anniversary of the balance sheet date, the percentage is
- the next step below the actual percentage at the balance sheet date if that actual percentage is more than 40%, and
- 40% otherwise.

Prescribed scenario 7

- .27 The interest rates for investment purchased or sold are 100% of the Base Scenario at the balance sheet date and 90% of the Base Scenario at the first anniversary from the balance sheet date and all following durations.

Prescribed scenario 8

- .28 The interest rates for investment purchased or sold are 100% of the Base Scenario at the balance sheet date and 110% of the Base Scenario at the first anniversary from the balance sheet date and all following durations.

Prescribed scenario 9

- .29 This scenario assumes continuance of risk-free interest rates and the premiums for default risk consistent with the current investment strategy and risk premiums available in the market at the balance sheet date.

Other scenarios

- .30 In addition to the prescribed scenarios, which are common to the calculation of policy liabilities for all insurers, the actuary would also select other scenarios which are appropriate to the circumstances of the case. If current rates are near or outside the limits of the prescribed ranges defined, then some scenarios would include rates that, in the near term, are outside the prescribed ranges. The reasonableness of degrees of change of interest rates is largely dependent on the period of time being considered. Other plausible scenarios include parallel shifts up and down as well as flattening and steepening of the yield curve. The scenarios would include those in which the premiums for default risk range from 50% to 200% of the actual premiums at the balance sheet date.

- .31 The number of other interest rate scenarios would be relatively large to the extent that
- the pattern of forecasted net cash flow in the Base Scenario is such that the classification of scenarios between favourable and unfavourable is unclear,
 - forecasted net cash flow is sensitive to the selection of interest rate scenarios,
 - the range of present values of forecasted net cash flow is wide, suggesting exposure to mismatch risk,
 - investment policy does not control mismatch risk,
 - asset-liability management is loose, or
 - flexibility to manage assets or liabilities is limited.

Stochastic scenarios

- .32 If stochastic modelling is performed, the actuary would ensure that the stochastic model includes scenarios that generate policy liabilities outside the range produced by application of the prescribed deterministic scenarios.

2340 OTHER ASSUMPTIONS: ECONOMIC

Margin for adverse deviations

- .001 The following significant considerations indicate difficulties in properly estimating the best estimate assumption:
- there is little relevant experience,
 - future experience is difficult to estimate,
 - operational risks adversely impact the likelihood of obtaining the best estimate assumption,
 - asset underwriting criteria are weak or poorly controlled,
 - there are liquidity concerns,
 - there is uncertainty regarding the credit enhancement techniques used,
 - the trust structure and legal responsibilities of the different parties for a securitized asset are not clearly understood in a practical and/or legal sense,
 - the asset held is from a non-passthrough structure with a repackaging of the credit risk that is difficult to understand,
 - the asset held is from a lower quality tranche of a non-passthrough structure that repackages credit risks,
 - there is uncertainty about the counterparty credit, or
 - there is no netting of the aggregate exposure with a counterparty.

.002 Other significant considerations indicative of a potential deterioration of the best estimate assumption include:

there is significant concentration of risks and/or lack of diversification, or

operational risks are present such that the likelihood of continuing to obtain the best estimate assumption is adversely impacted.

Fixed income assets: investment return

.01 The forecast of cash flow from a fixed income asset would be the promised cash flow over the term of the asset, modified for asset depreciation and borrower and issuer options.

2340.02
[2340.08](#)

Fixed income assets: asset depreciation

.02 The actuary's best estimate of asset depreciation would depend on

asset type, credit rating, liquidity, term, and duration since issue,

subordination to other debt of borrower or issuer,

the insurer's credit underwriting standards, diversification within a particular type of investments,

to the extent that it is indicative of the future, the insurer's own experience,

the insurance industry's experience,

guarantees which offset depreciation, such as that in an insured mortgage, and

potential for anti-selection by borrowers and issuers.

.03 Asset depreciation comprises that of both assets impaired at the balance sheet date and assets which become impaired after the balance sheet date, and includes loss of interest, loss of principal, and expense of managing default.

.04 Asset depreciation is likely to be relatively high after the forced renewal of a mortgage loan; i.e., one where the mortgagor can neither pay, nor find an alternative mortgagee for the balance outstanding at the end of its term but is able to continue its amortization. The explicit forecasting of subsequent cash flow is usually so conjectural that, to commute the cost of that asset depreciation to the end of the term of the mortgage is an acceptable approximation unless it undermines the interest rate assumption in the scenario.

.05 The actuary would not necessarily assume that the best estimate of asset depreciation is less than the premium of an asset's investment return over the corresponding default-free interest rate.

.06 The low and high margins for adverse deviations for a scenario are respectively 25% and 100% of the best estimate for that scenario, except that

a higher range is appropriate where those percentages of an unusually low best estimate are not meaningful, and

zero is usually appropriate for an Organisation for Economic Cooperation and Development (OECD) government's debt denominated in its own currency.

.07 Repealed

Fixed income assets: exercise of borrower and issuer options

.08 Examples of borrower and issuer options are the option to prepay a mortgage loan, to extend the term of a loan, and to call a bond.

.09 The assumed exercise may depend on the interest rates in the scenario. Anti-selection by commercial borrowers and issuers would usually be intense.

.10 Forecasted cash flow would include any penalty generated by exercise of an option.

Non-fixed income assets: investment return

.11 The actuary's best estimate of investment return on a non-fixed income asset would not be more favourable than a benchmark based on historical performance of assets of its class and characteristics.

.12 The low and high margins for adverse deviations in the assumptions of common share dividends and real estate rental income are respectively 5% and 20%.

.13 The margin for adverse deviations in the assumption of common share and real estate capital gains is 20% of the best estimate plus an assumption that those assets change in value at the time when the change is most adverse. That time would be determined by testing, but usually is the time when their book value is largest. The assumed change as a percentage of market value

of a diversified portfolio of North American common shares is 30%, and

of any other portfolio is in the range of 25% to 40% depending on the relative volatility of the two portfolios.

.14 Whether the assumed change is a gain or loss depends on its effect on benefits to policyholders. A capital loss may reduce policy liabilities as a result of that effect.

Taxation

1520.06

- .15 The best estimate would be for continuation of the tax regime at the balance sheet date, except that the best estimate should anticipate a definitive or virtually definitive decision to change that regime. The margin for adverse deviations would be zero.

Foreign exchange

- .16 The needed assumptions would include foreign exchange rates when policy liabilities and their supported assets are denominated in different currencies.
- .17 The best estimate would be for continuance of the foreign exchange rates at the balance sheet date, except that the best estimate should anticipate any imminent unfavourable devaluation. There would be a provision for adverse deviations in respect of a currency mismatch.

2350 OTHER ASSUMPTIONS: NON-ECONOMIC

Margin for adverse deviations

- .01 The actuary would select a margin for adverse deviations between a low margin and a high margin specified for each best estimate assumption discussed below, and of 5% and 20% (or -5% and -20%) respectively of each other best estimate assumption.
- .02 Provided, however, that, if a margin for adverse deviations cannot be defined as a percentage of the best estimate assumption, then the related provision for adverse deviations would be taken as the increase in policy liabilities which results from substitution of a conservative assumption for the best estimate assumption.
- .03 The following significant considerations indicate difficulties in properly estimating the best estimate assumption:
- the credibility of the company's experience is too low to be the primary source of data,
 - future experience is difficult to estimate,
 - the cohort of risks lack homogeneity,
 - operational risks adversely impact the likelihood of obtaining best estimate assumption, or
 - the derivation of the best estimate assumption is unrefined.

1740.39

.031 Other significant considerations indicative of a potential deterioration of the best estimate assumption include:

there is significant concentration of risks and/or lack of diversification,
operational risks adversely impact the likelihood of continuing to obtain best estimate assumption, or
past experience may not be representative of future experience and the experience may deteriorate.

Other significant considerations may exist, but are tied to specific assumptions. Where applicable, they are described below.

.04 A selection above the high margin is appropriate, however, for unusually high uncertainty or if the resulting provision for adverse deviations is unreasonably low because the margin is expressed as a percentage and the best estimate is unusually low.

Insurance mortality

.05 The actuary's best estimate of insurance mortality would depend on

the life insured's age, sex, smoking habit, health, and lifestyle,
duration since issue of the policy,
plan of insurance and its benefits provided,
the insurer's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies,
the size of the policy, and
the insurer's distribution system and other marketing practice,

and would include the effect of any anti-selection.

.06 If the actuary's best estimate assumption includes a secular trend toward lower mortality rates whose effect is to reduce the policy liabilities, then it is prescribed that the actuary negate that trend by an offsetting increase or decrease in what the actuary would otherwise select as a margin for adverse deviations.

.07 The low and high margins for adverse deviations for the mortality rate per 1,000 are respectively an addition of 3.75 and 15, each divided by the best estimate curtate expectation of life at the life insured's projected attained age.

.08 Repealed

1730.18

Annuity mortality

- .09 The actuary's best estimate assumption of annuity mortality would depend on
the annuitant's age, sex, smoking habit, health, and lifestyle,
size of premium,
plan of annuity and its benefits provided, and
whether registered or not, whether structured settlement, and whether
group or individual contract,
and would include the effect of any anti-selection resulting from the annuitant's option to
select the timing, form, or amount of annuity payment, or to commute annuity payments. 1730.18
- .10 The insurance underwriting in a "back-to-back" insurance/annuity package may
unfavourably affect the best estimate.
- .11 It is prescribed that the actuary's best estimate includes a secular trend toward lower
mortality rates as promulgated from time to time.
- .12 The low and high margins for adverse deviations are respectively a subtraction of 5% and
15% of the best estimate.
- .13 An additional significant consideration for the determination of the level of margin for
adverse deviations is the possibility of commuting survival dependent benefits after periodic
payments have started. [2350.01](#)

Morbidity

- .14 The actuary's best estimate of insurance morbidity would depend on
the life insured's age, sex, smoking habit, occupation, industry, health, and
lifestyle,
duration since issue of the policy,
in the case of income replacement insurance, definition of disability,
unemployment levels, and, in the case of an outstanding claim, cause of
disability,
plan of insurance and its benefits provided, including elimination period,
guarantees, deductibles, coinsurance, return-of-premium benefits, and
benefit limits, indexation, and offsets,

the insurer's underwriting practice (that of its reinsurer for facultative reinsurance), including, if applicable to the policy, the absence of underwriting or less stringent underwriting for a group of simultaneously sold policies,

the insurer's administration and claim adjudication practice,

the size of the policy,

seasonal variations,

in the case of group insurance, participation level, and

environmental factors, such as a change in the offset to government benefits,

1730.18

and would include the effect of any anti-selection.

- .15 If the actuary selects a higher-than-usual best estimate of disability incidence because of an outlook for a high level of unemployment, he or she would not necessarily select a concomitant higher-than-usual best estimate of disability termination.

.16 Repealed

- .17 The low and high margins for adverse deviations are respectively an addition of 5% and 20% of the best estimate of morbidity incidence rates, and a subtraction of 5% to 20% of the best estimate morbidity termination rates. The actuary's selection would reflect any expected correlation between incidence and termination rates.

- .18 The following additional significant considerations are taken into account when determining the level of margin for adverse deviations:

[2350.01](#)

the contract wording is not tight enough to protect against medical advances,

definitions of claim events are not precise and/or provide for potential anti-selection, or

the interpretation of claim event definitions by the court is uncertain.

Withdrawal and partial withdrawal

- .19 The actuary's best estimate of withdrawal rates would depend on
- policy plan and options,
 - the life insured's attained age,
 - duration since issue of the policy,
 - method of payment and frequency of premiums,
 - premium paying status,
 - policy size,
 - the policy's competitiveness, surrender charges, persistency bonuses, taxation upon withdrawal, and other incentives and disincentives to withdrawal,
 - policyholder and sales representative sophistication,
 - the insurer's distribution system and its commission, conversion, replacement, and other marketing practices, and
 - the interest rate scenario,
- and would include the effect of any anti-selection.
- .20 The insurer's withdrawal experience is pertinent and usually credible. It is not available for new products and for higher durations on recent products, which is a problem for the actuary if their policy liabilities are sensitive to withdrawal rates.
- .21 The automatic payment of insurance premiums by the annuity benefit in a "back-to-back" insurance/annuity package is a disincentive to withdrawal.
- .22 Reinsurance assumed withdrawal rates depend on practice in the direct insurer.
- .23 A "cliff" is a sudden significant increase in the benefit available at withdrawal. That increase may result from increase in cash value, decrease in surrender charge, or availability of a maturity benefit or persistency bonus. Unless there is pertinent persistency experience data to the contrary, the actuary's best estimate withdrawal rates would grade to zero as the cliff approaches and remains at zero for an interval before the cliff is reached. The same applies to a return of premium benefit in life insurance and to one in accident and sickness insurance, with modification in the latter case if the benefit is contingent upon zero claims or reduced by the amount of claims.
- .24 The actuary's best estimate withdrawal rate would be zero for a paid-up policy without non-forfeiture benefit.

1730.18

.25 The low and high margins for adverse deviations are respectively an addition or subtraction, as appropriate, of 5% and 20% of the best estimate withdrawal rates. In order to ensure that the margin for adverse deviations increases policy liabilities, the choice between addition and subtraction may need to vary by interest scenario, age, policy duration, and other parameters. In the case of partial withdrawal, two assumptions are needed – the amount withdrawn and the partial withdrawal rate.

.26 The following additional significant considerations are taken into account when determining the level of margin for adverse deviations in situations where a decrease in lapse rates increases the policy liabilities:

the remuneration policy encourages persistency, or

the cancellation of a contract would be clearly detrimental to the policyholder.

.261 The following additional significant considerations are taken into account when determining the level of margin for adverse deviations in situations where an increase in lapse rates increases the policy liabilities:

the remuneration policy encourages terminations,

cancellation of a contract would be clearly beneficial to the policyholder,

the company's contracts have provisions where rating decreases may trigger additional withdrawals, or

there is no market value adjustment on withdrawals for deposits and deferred annuities.

Anti-selective lapse

.27 Strictly speaking, "lapse" means termination of a policy with forfeiture, but in the context of anti-selection has come to include any termination or the election of the extended term insurance non-forfeiture option. "Anti-selective lapse" is a tendency of healthy policyholders to lapse or unhealthy policyholders not to lapse, with a concomitant deterioration in the insurer's mortality or morbidity experience. To determine whether the tendency has operated in a particular case requires either a re-underwriting of those who have lapsed and those who have not, or a study of the mortality among those who lapsed, neither of which is likely to be practical. Policyholders will, however, make decisions in their own perceived interest, so that anti-selective lapse is plausible whenever that perceived interest is for unhealthy policyholders not to lapse or for healthy policyholders to lapse.

- .28 It is difficult to estimate with confidence the intensity of anti-selective lapse. It is plausible that the intensity will be proportional to the intensity of policyholder perceived interest. However anti-selective lapse is merely a tendency provoked by the policyholder's perceived interest. The policyholder may not know the true state of his or her health. The policyholder may imprudently favour or be obliged by financial pressure to adopt a short-term interest with long-term detriment; thus, an unhealthy policyholder may lapse when the premium increases, perceiving the policy as no longer affordable. Through ignorance or inertia, a healthy policyholder may continue a policy which could be replaced by a superior one. Moreover, anti-selective lapse is not the unvarying effect of a decision in the policyholder's perceived interest: an unhealthy policyholder may lapse a policy no longer needed for which the healthy policyholder perceives continuing need. Without pertinent and reliable experience, however, the actuary would not assume that the non-lapsation of healthy policyholders favourably affects the best estimate for the persisting policyholders.
- .29 The premise to the actuary's assumptions would be that policyholder decisions
will tend to serve their perceived interest, and
not serve the insurer's interest unless the two run together.
- .30 Here are examples where the perceived interest of the healthy policyholder may be to lapse:
- a premium increase at renewal of term insurance,
 - an unfavourable underwriting decision at renewal of re-entry term insurance,
 - a benefit decrease or premium increase of adjustable insurance,
 - a premium needed to avoid termination of universal life insurance with exhausted funding,
 - a reduction in policyholder dividend scale,
 - an offer or availability of a superior replacement policy, such as by the creation of a preferred underwriting class,
 - a significant but temporary increase (spike) in non-forfeiture value, and
 - a downgrade in the insurer's credit rating.

1730.18

Expense

- .31 The actuary would select a best estimate assumption which provides for the expense of the relevant policies and their supporting assets, including overhead. The insurer's other expense is irrelevant to the valuation of policy liabilities. Other expense includes
- expense related to policies which, for the relevant policies, was incurred before the balance sheet date, such as marketing and other acquisition expense, and
 - expense not related to the relevant policies and their supporting assets, such as investment expense for the assets which support capital.
- .32 The assumption would provide for future expense inflation consistent with that in the interest rate scenario. [2330.01](#)
- .33 A stable insurer's expense experience is pertinent if its expense allocation is appropriate for valuation of policy liabilities (or if the actuary can correct the inappropriateness, e.g., by reallocating corporate expense to operating lines of business).
- .34 A particular insurer may have an expectation of reduced expense rates, but the actuary would anticipate only a reduction which is forecasted with confidence.
- .35 Investment expense comprises
- administration expense, both internal and external,
 - expense related to investment income, such as deferred fees and commissions and direct taxes, and
 - interest on money borrowed to finance investment.
- .36 The insurer incurs neither cash rental expense nor cash rental income on real estate which it owns and occupies. The actuary would deem such expense and, if the real estate supports the policy liabilities, such income at a reasonable rate in the selection of an assumption of expense and investment return.
- .37 Certain taxes are akin to expenses. The actuary would make similar provision for them in the policy liabilities to the extent that they relate to the relevant policies and their supporting assets. They include both premium taxes, which are straightforward, and taxes whose basis is neither income nor net income but which may be complicated by a relationship with income tax; for example, those currently incurred may be offset against later income tax. [2320.42](#)
- .38 The low and high margins for adverse deviations are respectively 2.5% and 10% of best estimate expense including inflation thereof. No margin for adverse deviations is needed for a tax, such as premium tax, whose history has been stable.

.39 The following additional significant considerations are taken into account when determining the level of margin for adverse deviations:

the distribution of general expenses by line of business, by product, or by issue and administrative expenses is not based on a recent internal expense study,

the allocation is not an appropriate basis for the best estimate expense assumption,

the expense study does not adequately reflect the appropriate expense drivers, or

future reductions in unit expenses (before inflation) are assumed.

Policyholder options

.40 Examples of policyholder options are an option

to purchase additional insurance,

to convert term to permanent insurance,

to select the extended term insurance non-forfeiture option,

to make partial withdrawal from a universal life insurance policy,

to select the amount of premium for a flexible premium policy, and

to purchase an annuity at a guaranteed rate.

.41 The actuary would select a best estimate assumption of policyholder exercise of both contractual options and extra-contractual options of which they have reasonable expectation.

.42 The actuary's best estimate would depend on

the life insured's attained age,

duration since issue of the policy,

plan of insurance and its benefits provided,

historical premium payment patterns,

method of premium payment,

sophistication of the policyholder and the intermediary,

perceived self-interest of the policyholder and the intermediary,

the policy's competitiveness, and

the insurer's distribution system and other marketing practice,

and would make provision for anti-selection.

- .43 The actuary would make provision for adverse deviations by testing the effect on policy liabilities of plausible alternative assumptions of policyholder exercise of options and adopting one with relatively high policy liabilities.

2400 THE APPOINTED ACTUARY

2410 DEFINITIONS

- .01 In sections 2400 and 2500, “senior management” means
- in the case of a Canadian insurer, both the chief executive officer and the chief financial officer, and,
 - in the case of a foreign insurer, both the Chief Agent for Canada and the person designated by the insurer as having responsibility for its Canadian operation.
- .02 In this section 2400, “directors” means an insurer’s Board of Directors and, in the case of a foreign insurer, includes the person whom they designate as responsible for the insurer’s Canadian branch.

2420 SCOPE {TC "SCOPE " \L 2}

- .01 The standards in this section 2400 apply to an appointed actuary who, pursuant to
- the federal *Insurance Companies Act*, is the actuary of a company or society,
 - the federal *Insurance Companies Act*, is the actuary of the Canadian branch of a foreign company, or
 - a provincial Act, has the access to information, protection against civil liability, and duties in an insurer which are substantially the same as those of the appointed actuary in the federal *Act*.

2430 EXTENSION OF SCOPE {TC "EXTENSION OF SCOPE " \L 2}

- .01 The standards in this section 2400 do not apply to an actuary who is not an appointed actuary unless that actuary has the access to information and protection against civil liability equivalent to that which the federal *Insurance Companies Act* grants to an appointed actuary.

2440 ACCEPTING AND CONTINUING AN ENGAGEMENT {TC "ACCEPTING AND CONTINUING AN ENGAGEMENT " \L 2}

- .01 *Section 1400 applies rigorously to the engagement.* [Effective January 1, 2003]

Qualifications, experience, and knowledge

- .02 As respects Rule 3, the necessary qualifications, experience, and knowledge go beyond technical understanding and include the awareness which comes with maturity, communications with other actuaries, discussions at Institute meetings, and familiarity with conditions both internal and external to the insurer, and include communications skills.

- .03 An actuary accepting an engagement for the first time may wish to arrange professional, formal, and timely access to another actuary with experience as an appointed actuary.
- .04 It is important that the insurer's directors understand and accept the actuary's role and its requirements for time, resources, and access to information. The actuary may wish written confirmation of the understanding and acceptance unless the role is part of the insurer's corporate culture.

Information needed

- .05 The information necessary for the work consists of the records, accounts, documents, and oral briefings which provide an understanding of the insurer's operations, its obligations and the resources available to meet those obligations. That information includes
- files of inforce policies and outstanding claims, including their reinsurance,
 - policy provisions and other communications with policyholders,
 - past experience data,
 - past financial data,
 - communications with auditors and regulators,
 - pricing practice,
 - underwriting practice,
 - claims settlement practice (including case estimate practice) and cost,
 - asset-liability management practice, and
 - capital management practice.
- .06 The process to identify and assure timely receipt of that information includes
- an understanding of the insurer's decision making,
 - continual communication with members of management who can supply information, and
 - continual communication with the auditor in accordance with the *CIA/CICA Joint Policy Statement*.

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2450 REPORT ON MATTERS REQUIRING RECTIFICATION

- .01 *The actuary should identify and monitor matters which may threaten the insurer's financial condition. The actuary should investigate and then report any such matter which requires rectification to the senior management and, in the case of a Canadian insurer, send a copy of the report to the directors. The report may include recommendations for rectification and should specify a deadline for rectification which the actuary may later extend if appropriate. If there is no suitable rectification by that deadline or its extension, then the actuary should report the matter to the insurer's regulator. [Effective January 1, 2003]*
- .02 The sensitivity of financial condition to adverse conditions and events varies among insurers. For example, an increase in withdrawal rates among policies may be devastating in one life insurer and may be beneficial in another. Financial condition, and hence the magnitude of the conditions and events which may threaten it, also varies among insurers.
- .03 The frequency and intensity of the monitoring depend on the threatening conditions and events and on the circumstances of the insurer. A quarterly review would usually be a minimum.
- .04 There would be no such report to senior management of an adverse condition which does not threaten the insurer's financial condition. Informal notification and consultation would usually precede, and may obviate, that report to senior management.
- .05 That report would describe the threatening condition or event and the methods and assumptions in the actuary's investigation of it. It is desirable that the report includes recommendations for its rectification.
- .06 The deadline would allow time which is reasonable in the circumstances to arrange rectification.
- .07 The report to the regulator would describe the actuary's investigation, the report to senior management, and senior management's response to that report. The actuary would advise the directors of the report to the regulator.

2460 REPORT TO THE DIRECTORS

- .01 *The actuary for a Canadian insurer should investigate and report at least yearly to the directors or to their audit committee if they so delegate*

on the insurer's financial position and financial condition and,

if the insurer has a participating account, on the allocation of income among accounts and on the dividend policy and dividend scales for the participating policyholders.

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- .02 *The actuary for a foreign insurer should report at least yearly to its Chief Agent for Canada on its financial position and financial condition.* [Effective January 1, 2003]

Allocation of income

- .03 The report on allocation of income among accounts would consider its fairness and equity to participating policyholders.

Dividend policy and dividend scale

- .04 The report on dividend policy and dividend scale would consider conformity of the dividend scale to the dividend policy.

2470 COMMUNICATION WITH THE AUDITOR

- .01 Communication with the insurer's auditor is desirable when the actuary makes a report to the insurer's senior management on a matter requiring rectification or makes an unfavourable report on the insurer's financial condition.

2480 CERTIFICATION OF REGULATORY CAPITAL FILING

- .01 This subsection 2480 applies to the appointed actuary of a life insurer when giving an opinion on the appropriateness of capital requirement calculations pursuant to law.
- .02 *The certification should contain an opinion signed by the actuary.*
- .03 *The actuary should prepare a memorandum to support the opinion that outlines the areas where the calculation required discretion or significant technical calculations, and the methodologies and judgments that were applied. The memorandum should be completed before the provision of a signed opinion pursuant to subsection 2480.* [Effective September 30, 2006]
- .04 The opinion will be made annually in support of the fiscal year-end regulatory capital filing on form(s) as prescribed by the regulator.
- .05 In providing such an opinion, the actuary is not opining on whether the underlying factors or specified methods to be followed are appropriate but rather on the appropriateness of any interpretation and discretionary technical calculations and methods with respect to such guidelines.

- .06 The wording of the opinion follows: [insert appropriate wording where indicated by square brackets]

“I have reviewed the calculation of the Minimum Continuing Capital and Surplus Requirement ratios of [Company name] as at [Date]. In my opinion, the calculation of the components of the required and available capital have been determined in accordance with the regulatory guidelines, and the components of the calculation requiring discretion were determined using methodologies and judgment appropriate to the circumstances of the company.”

[Note: For Test of Adequacy of Assets in Canada and Margin Requirements form filings “Minimum Continuing Capital and Surplus Requirement ratios”, and “required and available capital” are replaced by “Test of adequacy of margin”, and “required and available margin”.]

[Note: For filings for provincially regulated companies, the ratio definition and definitions of required and available resources should be amended to reflect the appropriate definitions in the provincial requirements.]

2500 DYNAMIC CAPITAL ADEQUACY TESTING

2510 SCOPE

- .01 This section 2500 applies to the appointed actuary of an insurer when preparing a report on the insurer's financial condition pursuant to law.

2520 INVESTIGATION

- .01 *The actuary should make an annual investigation of the insurer's recent and current financial position, and financial condition, as revealed by dynamic capital adequacy testing for various scenarios.*
- .02 *The actuary should make a report of each investigation in writing to the insurer's Board of Directors (or to their audit committee if they so delegate) or Chief Agent for Canada. The report should identify possible actions for dealing with any threats to satisfactory financial condition that the investigation reveals.*
- .03 *The actuary should also make an interim investigation if there is a material adverse change in the insurer's circumstances. [Effective January 1, 2003]*

2530 METHOD

Recent and current financial position

- .01 The investigation would review operations of recent years (normally at least three years) and the financial position at the end of each of those years.

Dynamic capital adequacy testing

- .02 Dynamic capital adequacy testing examines the effect of various plausible adverse scenarios on the insurer's forecasted capital adequacy. It is the actuary's primary tool for investigation of an insurer's financial condition.
- .03 The purpose of dynamic capital adequacy testing is to identify plausible threats to satisfactory financial condition, actions which lessen the likelihood of those threats, and actions that would mitigate a threat if it materialized.
- .04 Dynamic capital adequacy testing is defensive: it addresses threats to financial condition rather than the exploitation of opportunity.

Satisfactory financial condition

- .05 The insurer's financial condition is satisfactory if throughout the forecast period it is able to meet all its future obligations under the base scenario and all plausible adverse scenarios, and under the base scenario it meets the minimum regulatory capital requirement.
- .06 The minimum regulatory capital requirement is the requirement imposed by the regulator requiring the actuary's report on the insurer's financial condition or, in the absence of such a requirement, that selected by the insurer and approved by the regulator(s).

Forecast period

- .07 The forecast period begins at the most recent available fiscal year-end balance sheet date. The forecast period for a scenario would be long enough to capture the effect of its adversity and the ability of management to react. The forecast period for a typical life insurer would be five fiscal years. The forecast period for a typical property and casualty insurer would be three fiscal years.

Scenarios

- .08 The scenarios consist of a base scenario and several plausible adverse scenarios. Each scenario takes into account not only in force policies but also the policies assumed to be sold during the forecast period, and both insurance and non-insurance operations. (For example, the operations of an insurer's trust company subsidiary.)

Base scenario

- .09 The base scenario is a realistic set of assumptions used to forecast the insurer's financial position over the forecast period. Normally, the base scenario is consistent with the insurer's business plan. It is awkward if the base scenario is not consistent with the business plan, because that implies a difference in outlook between the insurer's management and the actuary. The actuary would normally accept the business plan's assumptions for use in the base scenario unless these assumptions are so inconsistent or unrealistic that the resulting report would be misleading. The actuary would report any material inconsistency between the base scenario and the business plan.

Plausible adverse scenarios

- .10 A plausible adverse scenario is a scenario of adverse, but plausible, assumptions about matters to which the insurer's financial condition is sensitive. Plausible adverse scenarios vary among insurers and may vary over time for a particular insurer.
- .11 The actuary would consider plausible material risks to the insurer. Scenario testing may be required for the actuary to determine the sensitivity of the insurer's capital adequacy to each risk. It is expected that the actuary would scenario test and report annually on the base scenario, and a minimum of three plausible adverse scenarios posing the greatest risk for the insurer. Fewer than three adverse scenarios may be reported only in the rare event that it is not possible to develop three plausible adverse scenarios.

- .12 For life insurers, the actuary would consider threats to capital adequacy under plausible adverse scenarios that include but are not limited to the following risk categories:
- mortality,
 - morbidity,
 - persistency and lapse,
 - cash flow mismatch (C-3 risk),
 - deterioration of asset values (C-1 risk),
 - new business,
 - expense,
 - reinsurance,
 - government and political,
 - off balance sheet, and
 - related companies.
- .13 For property and casualty insurers, the actuary would consider threats to capital adequacy under plausible adverse scenarios that include but are not limited to the following risk categories:
- frequency and severity,
 - pricing,
 - misestimation of policy liabilities,
 - inflation,
 - interest rate,
 - premium volume,
 - expense,
 - reinsurance,
 - deterioration of asset values (C-1 risk),
 - government and political action,
 - off balance sheet, and
 - related companies.
- .14 To help the actuary determine if a risk is material and plausible, it may be useful to stress test the capital adequacy of the insurer. The actuary might determine how much a base scenario assumption needs to be changed before an adverse scenario gives rise to an unsatisfactory financial condition. The actuary can then judge whether a plausible risk or event exists for the insurer over the forecast period.

Integrated scenarios

- .15 In many cases, plausible adverse scenarios are associated with a low probability of occurrence. In such cases, it is usually not necessary for the actuary to construct integrated scenarios by combining two or more low probability adverse scenarios.
- .16 In some cases, however, the probability associated with a plausible adverse scenario may be close to the probability associated with the base scenario. For example, a significant asset on the balance sheet may be showing early signs of distress. In such cases, an integrated scenario would be constructed by combining each more probable adverse scenario, with a low probability adverse scenario. The low probability adverse scenario selected would be the one that has the greatest effect on the insurer's financial condition and is plausible when combined with the more probable adverse scenario.

- .17 An integrated scenario would be included in the minimum of three plausible adverse scenarios required by 2530.11 if it (i.e., an integrated scenario) was found to be one of the three most adverse scenarios.

Ripple effects

- .18 In assuring consistency within each scenario, the actuary would consider “ripple” effects. Although most of the other assumptions used in the base scenario may remain appropriate under the plausible adverse scenario, some may require adjustment to reflect the interdependence of assumptions in the plausible adverse scenario.
- .19 Ripple effects include both policyholder action and the insurer’s expected response to adversity. Selection of the assumptions for the insurer’s response would, where appropriate, take into account:
- the effectiveness of the insurer’s management information systems and adjustment mechanisms,
 - the insurer’s historical record of promptness and willingness, when faced with adversity, to make difficult decisions, and
 - the external environment assumed in the scenario.

The actuary would report the expected response, so that users may consider its practicality and adequacy. The actuary may also report the results assuming that the insurer does not respond to the adversity.

- .20 Ripple effects also include regulatory action, especially under any plausible adverse scenario where the insurer fails to meet the minimum regulatory capital requirement. The actuary would consider action that could be taken by the Canadian regulator(s) as well as action taken by regulators in foreign jurisdictions. Such regulatory action and associated management response would consider the local assessment of solvency regardless of the insurer’s worldwide solvency position as measured by Canadian regulatory standards.

Scope of the investigation and report

- .21 The report would contain the key assumptions of the base scenario and the plausible adverse scenarios posing the greatest risk to the satisfactory financial condition of the insurer. The report would disclose each of the risk categories considered in undertaking the dynamic capital adequacy testing analysis, including those identified in this standard. The meaning of satisfactory financial condition under this standard would be disclosed in the report.
- .22 The report would also contain the plausible adverse scenarios examined that cause the insurer to fall below the minimum regulatory capital requirement. Even though the actuary may have signed a satisfactory financial condition opinion, the report would make it clear that under these scenarios the regulators may impose restrictions on the operations of the insurer, including its ability to write new business.

- .23 If the investigation identifies any plausible threat to satisfactory financial condition, then the actuary would attempt to identify extraordinary management action that would lessen the likelihood of that threat, or which would mitigate that threat, if it materialized. For each such plausible adverse scenario reported upon, the actuary would report the results with the insurer's expected response to adversity but before extraordinary management action, and additionally including the effect of any extraordinary management action. The actuary would report the extraordinary management action so that users may consider its practicality and adequacy.

[2530.20](#)

Revaluation of the policy liabilities

- .24 Ideally, for each adverse scenario, the policy liabilities would be revalued throughout the forecast period. But their revaluation only at the end of the forecast period may be a suitable compromise, unless the actuary believes, given the financial position at the end of the forecast period, that the financial condition would not be satisfactory at some point during the forecast period if revaluation were performed at that point.

Interim investigation

- .25 In rare cases, a material adverse change in the insurer's circumstances since the last annual investigation may be so far reaching that to delay reporting to the time of the next annual investigation would be imprudent. For example, failure to meet the minimum applicable regulatory capital requirement, or adoption of a radically different business plan, may make an immediate report urgent. In such a case, the actuary would undertake and report on an interim investigation.

2540 REPORTING

- .01 In the case of a Canadian insurer, the actuary would report to the Board of Directors or to their audit committee if they so delegate. In the case of a Canadian branch of a foreign insurer, the actuary would report to the Chief Agent for Canada and may also report to the responsible senior executive in the parent head office.
- .02 In order to give the insurer's senior management an opportunity to react to the results of the investigation, the actuary would normally discuss the report with the insurer's senior management in advance of its submission to the Board of Directors or Chief Agent for Canada.
- .03 The report would be in writing, but an additional oral report that permits questions and discussions is desirable. An interpretative report is more useful than a statistical report.
- .04 The timing of the report would depend on the urgency of the matters reported and on the desirability of integrating dynamic capital adequacy testing into the insurer's annual financial planning cycle. The annual report would be submitted within twelve months of each fiscal year-end.

2550 OPINION

- .01 *The report should contain an opinion signed by the actuary. The purpose of the opinion is to report on the financial condition of the insurer. [Effective January 1, 2003]*
- .02 In this opinion, “future financial condition” has the same meaning as “financial condition.” The actuary may use the words “future financial condition” in order to comply with legislation or regulation in some jurisdictions.
- .03 The wording of the opinion follows: [insert appropriate wording where indicated by square brackets]

“I have completed my annual investigation of the [future] financial condition of [company name] as at [date] in accordance with accepted actuarial practice. I have analyzed the forecasted financial positions of the company during the [number] year forecast period under a series of scenarios. A description of these scenarios and their impact on the company is included within this report.

The analysis incorporates assumptions relating to business growth, investments, [mortality, morbidity, claims frequency, capital injections, other policy-related experience] and other internal and external conditions during the forecast period as well as potential management responses to various plausible adverse scenarios. The most significant assumptions are described within this report.

In my opinion, the [future] financial condition of the company [is satisfactory under these assumptions or is not satisfactory for the following reason(s)...].

[Montréal, Québec]

[Mary F. Roe]

[Report date]

Fellow, Canadian Institute of Actuaries

3000 – PENSION PLANS

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3100 SCOPE

.01 The standards in sections 3100 through 3700 apply to an actuary's advice on the financial position or financial condition of a pension plan which provides lifetime retirement income to its members, whether funded or not, whether registered or not, and whether in the private or public sector, except for the following:

A plan for which no unfunded actuarial liabilities may ever exist by reason of the nature of the plan; i.e., a pure defined contribution pension plan. The standards apply, however, to any hybrid of defined contribution and defined benefit pension plans, such as modified defined contribution, target benefit, floor, and cash balance pension plans.

A plan whose benefits are guaranteed by a life insurer.

Social security programs like the Canada Pension Plan, Québec Pension Plan, and the pension provided by the federal *Old Age Security Act*.

.02 The standards in sections 3100 through 3600 apply to all such advice, including wind-up, hypothetical wind-up and solvency valuations, while the standards in section 3700 apply only to the valuation of a pension plan registered under the *Income Tax Act (Canada)* which is being wound up, fully or partially, actually or hypothetically, including a solvency valuation.

.03 An actuary's advice on the financial position or financial condition of a pension plan may relate to items such as

its funding,

the application to its funding of the limitations in the federal *Income Tax Act (Canada)* and of the requirements of pension plan legislation,

its solvency, as required by pension plan legislation,

its financial statements,

its accounting in the employer's financial statements, or

the allocation or distribution of its assets if it is wound up or if all or part of the employer's operations are disposed of or shut down.

.04 The standards in section 3800 apply to an actuary's advice on the computation of commuted values in the circumstances described in subsection 3810.

3200 METHODS

- .01 *The actuary should select an asset valuation method and an actuarial cost method which are appropriate for the purpose and circumstances of the work.*
- .02 *The actuary should not select a forecast actuarial cost method to value a plan's liabilities for giving advice on its funding if it is a registered pension plan under the Income Tax Act.*
- .03 *The actuary should assume that the plan continues as a going concern, but may assume otherwise if wind-up liabilities exceed going concern liabilities, and should assume otherwise if wind-up is imminent. [Effective December 1, 2002]*

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Valuation of assets

- .04 For a going concern valuation, the value of assets may be any of
- their market value,
 - their market value adjusted to moderate its volatility,
 - the present value of their cash flows after the calculation date, and
 - their value assuming a constant rate of return to maturity in the case of illiquid assets with fixed redemption values.

Actuarial cost methods

- .05 For a going concern valuation, actuarial cost methods include:
- Cost allocation methods, which allocate the cost of projected benefits among time periods. They include attained age actuarial cost methods, entry age actuarial cost methods, aggregate actuarial cost methods, and individual level premium actuarial cost methods.
 - Benefit allocation methods, which allocate cost for a time period as a function of the change in accrued benefits during the period. They include the accrued benefit actuarial cost method, the unit credit actuarial cost method and the projected unit credit actuarial cost method.

There are also forecast actuarial cost methods, which allocate cost to the forecast period based on

the liabilities at the end of the period including, if appropriate, benefits for those who become members between the calculation date and the end of the period, minus

the corresponding liabilities at the calculation date, brought forward with interest to the end of the period, plus

the benefits expected to be paid during the period, brought forward with interest to the end of the period.

.06 When using a forecast actuarial cost method, the beginning and ending liabilities may be calculated from either a wind-up or a going concern valuation. Where appropriate, the actuary would select a sufficiently long forecast period that the valuation reflects the long term cost allocation pattern.

.07 No provision is needed for expenses to be paid by the employer. In case of doubt, it would be prudent to assume that expenses are paid from the plan's assets.

Imminent wind-up

.08 The actuary would base advice on a wind-up valuation if there is a definitive or virtually definitive decision to wind-up the plan

made on or before the calculation date and effective after that date, or

made after the calculation date and effective on or before that date.

.09 If the decision to wind up is both made and effective after the calculation date, then the actuary would decide between anticipating and not anticipating the wind-up in accordance with the recommendation for subsequent events.

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3300 ASSUMPTIONS

.01 *The assumptions for a going concern valuation of the liabilities of an earnings-related pension plan should include an assumption about members' earnings between the calculation date and*

their dates of termination of active membership in the case of a cost allocation method or benefit allocation method, and

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at least the end of the forecast period in the case of a forecast method.

.02 *In the case of a career average plan, that assumption about members' future earnings is needed only if it is relevant to the actuarial cost method selected by the actuary.*

.03 *The assumptions used to value liabilities should be consistent with the asset valuation method selected.*

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.04 *The actuary should make provision for any expenses that are expected to be paid from the plan's assets. [Effective December 1, 2002]*

.05 *The consistency required by paragraph .03 is achieved if the asset valuation method, when considered in conjunction with the assumed rate of investment return, can reasonably be expected to result in gains and losses which will offset each other over the long term. In assessing this consistency, the actuary may ignore any margins for adverse deviations or compensating adjustments in related assumptions.*

3400 FUNDING

.01 The standards in this section apply to advice on funding a plan. Advice on funding does not necessarily include advice on the effect of a proposed change to a plan.

.02 *The actuary's advice on funding should take account of the objectives of funding and of the relationship between the plan's assets and liabilities.*

.03 *The actuary's advice on funding should take account of the plan's benefits at the calculation date, except that, subject to disclosure, that advice*

subject to discussion with the plan administrator, may anticipate an expected amendment to the plan which increases its benefits,

in respect of funding between the calculation date and the effective date of a pending amendment to the plan, may disregard that amendment,

if the law requires, may disregard certain benefits stipulated in law, but the actuary should, unless

the plan is a "designated plan" that has as members only persons "connected" with the employer (as those two terms are defined in the Income Tax Regulations), and

the sole purpose of the valuation is to determine the maximum contributions permitted under the Income Tax Act,

also report the funding required in accordance with accepted actuarial practice, and

if the law permits, may disregard certain benefits stipulated by the terms of the engagement, but the actuary should also report the funding required in accordance with accepted actuarial practice.

.04 *The actuary's advice on funding should cover at least the period between the calculation date and the next calculation date. [Effective December 1, 2002]*

Objectives of funding

.05 The objectives of funding a plan in accordance with accepted actuarial practice are

the systematic accumulation over time of dedicated assets which, without recourse to the employer's assets, secure the plan's benefits in respect of members' service already rendered, and

the orderly and rational allocation of contributions among time periods.

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Range of Contributions

.06 The actuary's advice on funding may allow a range of contributions.

Anticipated funding of expected amendment

.07 The actuary's advice on funding may, subject to disclosure, anticipate an expected amendment to the plan that increases its benefits. For example:

An amendment to take advantage of scheduled relaxation of a limitation in the federal *Income Tax Act* on the level of benefits which may be funded.

An amendment in accordance with custom. For example, the plan, while nominally a career average pension plan, may effectively have been operating, and may be expected to continue to operate, as a final earnings pension plan as a result of periodic increases in accrued benefits to reflect current earnings.

Deferred funding of pending amendment

.08 If, at the calculation date, an amendment to the plan is definitive or virtually definitive, and if the effective date of the amendment is

during the period for which the report gives advice on funding, then the advice on funding up to that effective date may disregard the amendment, but the advice on funding thereafter would take the amendment into account, or

after the period for which the report gives advice on funding, then that advice may, subject to disclosure, disregard the amendment.

.09 "Effective date of the amendment" is the date at which the amended benefits take effect, as opposed to the date at which the amendment becomes definitive.

Next calculation date

.10 The next calculation date would be the latest date which will be appropriate for the next valuation.

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3500 ACCOUNTING FOR PENSION COSTS

.01 The standards in this section apply to advice on accounting for a plan's costs and obligations in the employer's or the plan's financial statements. 1410

.02 *If called for by the engagement, the actuary should select methods and assumptions for the valuation of assets and liabilities that are appropriate to the basis of accounting in the employer's or plan's financial statements, as applicable.*

.03 *The assumptions which the actuary selects should be best estimate assumptions.*

.04 *With respect to the assumptions, the actuary should report one of the following*

the preparers of the financial statements have selected the assumptions and the actuary expresses no opinion on them,

the preparers of the financial statements have selected the assumptions and they are, or are not, in accordance with accepted actuarial practice, or

the actuary has selected the assumptions and they are in accordance with accepted actuarial practice. [Effective December 1, 2002]

.05 The actuary would reflect the accounting standards specified by the terms of the engagement. For work in Canada, the CICA Handbook and other CICA guidance would usually be specified. In particular, if the actuary is aware at the time of preparation of the report of any subsequent event that makes the entity a different entity after the calculation date, the actuary would report an estimate of the financial effect of such subsequent event, or in the rare circumstance that it is impractical to make such an estimate, include a statement to that effect. 1720
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.06 If the preparers of the financial statements select the assumptions and they are not in accordance with accepted actuarial practice, Rule 6 may apply. That is so whether or not the actuary expresses an opinion on the assumptions.

3600 REPORTING: EXTERNAL USER REPORT
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.01 *In the case of an external user report on work which includes a valuation of assets and liabilities, the actuary should summarize the result of the valuation and should*

describe the source and verification of data with respect to members, plan provisions, and assets, and the date at which they were compiled,

describe the data with respect to members,

describe the plan's provisions, including the identification of any expected amendment that has been valued,

disclose subsequent events, whether or not the events are taken into account in the work, and, if there are no subsequent events, include a statement to that effect,

describe the method and assumptions for valuation of the liabilities, and

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describe the method to value the assets, disclose their value, and, if available, their market value and their value in the plan's financial statements, and provide an explanation of any differences among them.

.02 *If the valuation includes no provision for adverse deviations, the actuary should say so and say why.*

.03 *If the report gives advice on funding, then the actuary should*

describe the actuarial cost method in the case of a going concern valuation and the method to value benefits in the case of a wind-up valuation,

if recommending contributions, describe their determination between the calculation date and the next calculation date,

if contributions are fixed, either

report that the contributions are adequate to fund the plan, or

report the required increase in contributions, the required reduction in benefits, or the combination thereof that will address the funding shortfall,

except where

the plan is a “designated plan” that has as members only persons “connected” with the employer (as those two terms are defined in the Income Tax Regulations), and

the sole purpose of the valuation is to determine the maximum contributions permitted under the Income Tax Act,

disclose the amount of funding needed in accordance with accepted actuarial practice if reporting lower funding for a registered plan in accordance with law or the terms of the engagement,

name the next calculation date,

disclose any pending but definitive or virtually definitive amendment, the funding of which has been deferred beyond the next calculation date,

in the case of a going concern valuation, describe and quantify the gains and losses between the prior calculation date and the calculation date,

disclose the financial position of the plan if it were to be wound up on the calculation date, unless the plan does not define the benefits payable upon wind-up, in which case the actuary should include a statement to that effect, and

if the report gives advice on funding, the description of assumptions should include the rationale for the selection of each assumption that is material to such advice.

.04 *If the report gives advice on accounting, the actuary should*

describe the actuarial cost method,

describe the method and period selected in connection with any amortization of pension costs,

if the valuation is an extrapolation of an earlier valuation, describe the method and any assumptions for, and the period of, the extrapolation,

state whether or not the valuation conforms with the accounting standards specified by the terms of the engagement, and

either opine that the assumptions used are, or are not, in accordance with accepted actuarial practice, or state that the actuary expresses no such opinion.

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.05 *The report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation.*

Statements of Opinion

.06 *If the report gives advice on funding, the actuary should provide the following four statements of opinion, all in the same section of the report and in the following order:*

1. *a statement as to data, which should usually be as follows: “In my/our opinion, the data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;* 1530
2. *a statement as to assumptions, which should usually be as follows: “In my/our opinion, the assumptions are, in aggregate, appropriate for the purpose(s) of”;* 1730
3. *a statement as to methods, which should usually be as follows: “In my/our opinion, the methods employed in the valuation are appropriate for the purpose(s) of”; and*
4. *a statement as to conformation, which should be as follows: “This report has been prepared, and my/our opinions given, in accordance with accepted actuarial practice.” [Effective December 1, 2002]*

.07 Where different statements of opinion apply in respect of different purposes of the valuation, the above requirements may be modified but would be followed to the extent practicable.

.08 While a separate statement as to assumptions would generally be included in respect of each purpose of the valuation, the statements as to assumptions may be combined where the statements do not differ between some or all of the valuation’s purposes. The report would clearly indicate which statement as to assumptions applies to each of the valuation’s purposes.

.09 While a separate statement as to methods would generally be included in respect of each purpose of the valuation, the statements as to methods may be combined where the statements do not differ between some or all of the valuation’s purposes. The report would clearly indicate which statement as to methods applies to each of the valuation’s purposes.

Data

.10 The description of verification of data would include a description of the main tests of the data’s sufficiency and reliability and of any assumptions in respect of insufficient or unreliable data.

Assumptions

.11 The description of assumptions would include a description of each nominal change to the assumptions of the prior valuation and a quantification of their aggregate effect. However, if a plan amendment prompts the actuary to change the assumptions, the actuary may report the combined effect of the amendment and the resultant change in assumptions. 1510.13
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Methods

- .12 The description of the method to value the assets would include a description of any change to the method of the prior valuation and a quantification of the effect of the change.
- .13 The description of the actuarial cost method would include a description of any change to the method of the prior valuation and a quantification of the effect of the change.
- .14 For a funding valuation, the description of the actuarial cost method would include a description of
- the effect of the selected actuarial cost method on the security of benefits and on the pattern of future contributions,
- the options with respect to any shortfall or excess of assets over liabilities, and
- any anticipated or deferred funding, any taking account of imminent wind-up and, in the case of anticipated or deferred funding, a quantification of its financial effect on the value of benefits and on the pattern of future contributions.

3700 WIND-UP, HYPOTHETICAL WIND-UP, OR SOLVENCY VALUATION

3710 SCOPE

- .01 The standards in this section 3700 apply to the valuation of a pension plan registered under the *Income Tax Act* which is being wound-up, fully or partially, actually or hypothetically, including a solvency valuation. The standards in sections 3100 through 3600 also apply.
- .02 This section is not intended to prescribe the manner in which
- the assets would be allocated between jurisdictions in the case of wind-up of a pension plan covering members in several jurisdictions,
 - final benefit entitlements would be determined,
 - contributions to a pension benefits guarantee fund would be determined,
 - funding obligations would be determined, or
 - assets would be allocated between the employer and the members or between the members themselves.
- .03 Rather, those issues would be determined in accordance with law or the plan provisions, or an entity empowered thereunder to make that determination. It may, however, be appropriate to use the results of the valuation to address one or more of those issues, or to disclose their resolution in the report.

3720 WIND-UP VALUATION

Assumptions and methods

- .01 *The selected assumptions should*
- be best estimate assumptions,*
 - be determined as at the cut-off date,*
 - in respect of benefit entitlements that are expected to be settled by purchase of annuities, reflect single premium annuity rates, and*
 - in respect of benefit entitlements that are expected to be settled by lump sum transfer, reflect the recommendations respecting capitalized values.*

.02 *The actuary should either*
select and report an explicit assumption regarding the expenses of wind-up and
offset the resulting expense provision against the plan's assets, or
justify the expectation that expenses will not be paid from the plan's assets.

.03 *The actuary should take subsequent events up to the cut-off date into account. The actuary*
should report an undertaking to produce a later report if the actuary expects that a later report
date would reveal additional subsequent events.

.04 *The plan's assets should be valued at liquidation value.*

Reporting

.05 *If the report is preliminary, then the actuary should report that the financial position at*
settlement may differ from that reported. If the report is final and there has been a preliminary
report, then the actuary should explain the differences between the reported financial positions.

.06 *The actuary should report*
the wind-up date, the calculation date, the cut-off date, and the report date,
a description of the events precipitating the wind-up that affect the terms of the
wind-up, the benefit entitlements, or the valuation results,
if the actuary relies upon written direction concerning unclear or contentious
issues,
each issue on which the actuary relies on written direction,
the identity and basis of authority of the person providing such written
direction, and
the written direction relied upon or, where appropriate, a summary
thereof,
the determination and amount of any claims to a pension benefit guarantee fund,
the amount of any claims to a trustee in bankruptcy,
either the detailed individual membership data or an offer to provide them on
request to the employer, the plan administrator, or the regulator,

any amendments made since the last valuation report which affect the distribution of assets or benefit entitlements,

assumptions made about missing data,

where the plan participant has a choice which he/she has not yet made between a transfer value and insuring his/her benefits, the assumptions made regarding such choice,

a description of the post-wind-up contingencies which affect benefit entitlements,

any benefits that have been insured,

if applicable, the method to allocate assets among classes of liabilities, the method to distribute surplus, the justification of those methods, and their effect,

a summary of the assets by major category,

the actuary's role in calculating capitalized values, the standards for their calculation, and an opinion on whether their calculation is in accordance with accepted actuarial practice,

whether a recalculation of the value of benefit entitlements is required at settlement, and

the sensitivity of the valuation results to the plan's investment policy and to market conditions between the report date and the settlement date. [Effective December 1, 2002]

Dates

.07 The wind-up date is the date of termination of the pension plan as determined by law, the plan provisions, the regulator, or the plan administrator, usually in that order of priority.

.08 The calculation date for the plan's financial position is usually the wind-up date. The calculation of the benefit entitlements would not be affected by the choice of the calculation date.

.09 The cut-off date is the date up to which subsequent events would be recognized in the valuation.

.10 For a particular member,

the date of calculation of benefit entitlement depends on the circumstances of the wind-up, the terms of the plan, and the law, and may be the date of termination of employment, the date of termination of membership, the wind-up date, or another date, and

the settlement date is the date of settlement of his or her benefit entitlement.

Nature of wind-ups

- .11 The purpose of a wind-up valuation may be to determine, or to provide the basis for determining
- the financial position of the plan,
 - the total value of the benefit entitlements of all plan members prior to taking account of the financial position of the plan,
 - any required additional funding,
 - the amounts and methods of settlement of benefit entitlements, including any adjustment required due to a wind-up deficit, or
 - the amount and method of distribution of a wind-up surplus.
- .12 Plan wind-up is complex and may take a long time. Months and sometimes years elapse between the wind-up date and the settlement date. Delay creates difficulties which may require a series of reports by the actuary. Since the financial position of the plan determines whether benefit entitlements can be settled in full, the reflection of subsequent events in each report is critical.
- .13 For example, between the wind-up date and the settlement date
- the wind-up liabilities will fluctuate if there are fluctuations in interest rates and annuity prices, and
 - the surplus will fluctuate if there are fluctuations in interest rates and the assets and liabilities are not matched.
- .14 The actuary would usually report the value of the benefit entitlements of all plan members and the financial position of the plan. That report would be filed with the regulator for approval. After that approval, the plan administrator would settle the benefit entitlements.
- .15 The actuary may prepare or may be required to prepare a final report after settlement of all benefit entitlements. Such report, if any, would document the distribution of the plan's assets by describing those entitlements and their settlement.

Data

- .16 The data are the responsibility of the plan administrator. The actuary would, however, report on the sufficiency and reliability of the data, including specifically the capitalized values included in the valuation whether or not the plan administrator was the calculator thereof.
- .17 The finality of wind-up calls for the actuary to obtain precise data. The actuary may, in rare circumstances, include contingency reserves in the wind-up valuation of the pension plan with respect to missing plan members, if the actuary has reason to believe that additional members still have benefit entitlements under the pension plan but their membership information is missing.

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.18 The reported membership data would include details of the amount and terms of payment of each member's benefits.

Use of another person's work

.19 Some aspects of plan wind-up may be unclear or contentious. Examples are

- interpretation of the law,
- the determination of the wind-up date,
- the members, former members or recently terminated members to be included in the wind-up,
- whether or not to assume salary increases in determining benefit entitlements,
- eligibility for plant closure benefits and permanent lay-off benefits,
- eligibility for benefits payable only with the consent of the employer or plan administrator,
- the liquidation value of the plan's assets,
- the method to allocate the plan's assets among members,
- the allocation of surplus between the employer and the members, and
- whether or not wind-up expenses are to be paid from the plan's assets.

.20 To decide those aspects, the actuary may rely upon written direction from another person with the necessary knowledge, such as legal counsel or the employer, or the necessary authority, such as a regulator or the plan administrator. The actuary would consider any issues of confidentiality or privilege that may arise.

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Settlement methods

.21 Examples of settlement methods are:

Determine the capitalized value at the wind-up date and then accumulate the result to the settlement date using the interest rate underlying the capitalized value calculation. This method is often required by law.

Determine the capitalized value at the settlement date based on the benefit entitlements at the wind-up date, but with assumptions for capitalized values at the settlement date.

Determine the percentage of the plan's assets payable at the wind-up date to each member based on the pro rata value of the member's benefit entitlements to the value of all benefit entitlements. The member's percentage is then multiplied by the actual value of the plan's assets at the settlement date. This method is sometimes referred to as the "unitization" method.

.22 Under these and other methods, adjustment would be made for benefit payments and/or contributions between the wind-up date and the settlement date.

.23 Accepted actuarial practice provides no guidance on selection of the settlement method. The actuary may rely upon written direction on its selection from the plan administrator or the regulator.

Assumptions

.24 The best estimate assumptions selected would be chosen so as not to distort, favourably or unfavourably, the value of any member's, or former member's, benefit entitlement relative to others.

.25 If a bona fide annuity quotation is unavailable, the actuary may substitute an adjusted capitalized value based on the recommendations for capitalized values. The adjustment would be made in order to more closely approximate an annuity premium by, for example,

removing the monthly lag in economic indices in the prescribed assumptions for capitalized values,

adjusting the prescribed assumptions to reflect recent historical differences between capitalized values and annuity premium rates, or

adjusting for any commissions payable.

.26 If future benefits depend on continued employment (e.g., the plan is terminating but employment is not), the actuary would consider reflecting contingencies such as future salary increases and termination of employment.

.27 If the plan provides special early retirement allowances that may be reduced if the member has employment income during their term, then the wind-up valuation requires assumptions regarding the likelihood and the amount of the member's future employment income. To extrapolate the plan's historical experience as a going concern is not necessarily appropriate in selecting those assumptions.

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.28 Wind-up expenses usually include

fees related to the actuarial wind-up report,

fees imposed by a pension supervisory authority,

legal fees,

administration expenses, and

custodial and investment management expenses.

.29 The actuary would net wind-up expenses against the plan's assets in calculating the ratio of assets to liabilities as a measure of financial security of the benefit entitlements. However, an exception may be made for future custodial and investment management expenses, which may be netted against future investment return in the treatment of subsequent events.

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Benefit entitlements

.30 Post-wind-up contingencies may affect benefit entitlements. Examples are

- member election of optional forms of benefits,
- salary increases, and
- change in marital status.

Subsequent events

.31 In contrast to a going concern valuation, in a wind-up valuation all subsequent events would ideally be reflected. This ensures that the financial position of the plan is presented as fairly as possible as of the report date. However, it is impossible to recognize subsequent events right up to the report date. Accordingly, the actuary would select a cut-off date which is close to the report date.

.32 The actuary would ascertain that no subsequent events have occurred between the cut-off date and the report date that would significantly change the plan's financial position, otherwise the actuary would select a later cut-off date. For clarity, a subsequent event may be material yet not be so significant as to require selection of a later cut-off date.

.33 It may be appropriate to have more than one cut-off date. For example, the actuary may select one cut-off date for the active membership data and another cut-off date for the inactive membership data.

.34 Common subsequent events are

- contributions,
- expenses paid from the plan's assets,
- the actual investment return on the plan's assets,
- a change in annuity purchase rates,
- a change in assumptions for the calculation of capitalized values,
- data corrections,
- deaths of members, and
- elections of optional forms of benefits by members.

1520.13

.35 An accepted practice for taking account of subsequent events is to determine the liabilities as of the cut-off date and then discount such liabilities back to the calculation date at an interest rate equal to the rate of investment return, net of investment expenses, earned on the assets between the calculation date and the cut-off date. The assets would be determined at the calculation date, but adjusted for the subsequent events (such as contributions and non-investment expenses) which affect assets.

.36 There may be situations where, due to law or practical considerations, subsequent events are not recognized, at least in a preliminary report. Current examples of such situations relate to certain reports submitted to the regulator of the Ontario Pension Benefits Guarantee Fund and to reports submitted to the Québec regulator. In such reports, the effect of subsequent events may be quantified in an approximate manner provided that the financial position of the plan as indicated in the valuation report does not have a direct bearing on the members' eventual settlement. Where the effect of subsequent events is provided in a later report, it may be practical in that report to use a calculation date corresponding to the cut-off date.

3730 PARTIAL WIND-UP VALUATION

.01 A partial wind-up occurs when a subset of the members terminates membership in circumstances which require wind-up with respect to those members. Such wind-up does not apply to the continuing members, although it may be necessary for legal or other reasons to also value the benefits of the continuing members.

.02 The laws regarding partial wind-ups vary by jurisdiction. As a result, their application can cause a partial wind-up to range from an insignificant change in the plan to something similar to a total wind-up.

.03 The standards for a partial wind-up are the same as the standards for a "full" wind-up. Their application may be easier, however, when the partial wind-up applies to relatively few members. For example,

the standard of materiality for determination of benefit entitlements may be less rigorous for continuing members than for those to whom the partial wind-up applies, and

the standards for reporting may be abbreviated; for example, the reporting of immaterial wind-up expenses is unnecessary.

3740 HYPOTHETICAL WIND-UP VALUATION

.01 This subsection applies to a hypothetical wind-up valuation
to provide an alternative funding basis to a going concern valuation (that is, wind-up is not imminent, but wind-up liabilities exceed going concern liabilities), or
to illustrate the financial position of the plan if it were wound up.

.02 The standards for a wind-up valuation apply to a hypothetical wind-up valuation except
as superseded by the following recommendations and
detailed individual membership data need not be reported.

.03 *The actuary should determine benefit entitlements on the premise that the pension plan has neither a surplus nor a deficit.*

.04 *The actuary should include contingent wind-up benefits in the valuation when the valuation is to illustrate the financial position of the plan if it were wound-up.*

.05 *The actuary should assume that the wind-up date, the calculation date and the settlement date are coincident.*

.06 *The actuary should report any explicit assumption of expenses payable from the plan's assets required to wind-up the plan, including any assumptions with respect to the solvency of the employer in deriving the expense assumption. [Effective December 1, 2002]*

Membership data

3740.09

.07 The precision of the data on plan membership is less critical for a hypothetical wind-up valuation than for an actual wind-up valuation.

.08 Since an actual wind-up is not occurring, pertinent membership data may not be available (e.g., actual final average earnings). The actuary would make appropriate assumptions regarding such missing data. For example, it may be appropriate to retroject current earnings based on aggregate historical pay increases in order to estimate final average earnings.

Contingent wind-up benefits

.09 Contingent wind-up benefits are those benefit entitlements which depend on the circumstances of the wind-up. For instance, some benefit entitlements may apply only if the plan wind-up is concurrent with the closure of a plant or if employment continues. Accordingly, the effect of contingent wind-up benefits on the valuation may depend on the scenario that the actuary postulates. The actuary may postulate any internally consistent scenario, except that a scenario which maximizes wind-up liabilities would be used if the purpose of the valuation is to illustrate the financial position of the plan if it were wound-up.

Subsequent Events

- .10 The actuary may reflect subsequent events in the valuation provided that doing so either increases the liabilities or reduces the assets of the plan.

Valuation of assets

- .11 It is not necessary to determine the value of assets whose market value is not readily available, unless the value of these assets has a material effect on the financial position of the pension plan.
- .12 The actuary may use a reasonable approximation for the market value and disclose the approximation in the valuation report.

Wind-up expenses

- .13 Since the actuary would assume that the plan has neither a surplus nor a deficit, wind-up expenses related to the resolution of surplus or deficit issues need not be considered.

3750 SOLVENCY VALUATION

- .01 A solvency valuation is a hypothetical wind-up valuation which is prescribed by legislation and which imposes a floor to required contributions and a ceiling on what may be transferred out of the plan's assets upon termination of membership.

- .02 The actuary would apply to a solvency valuation the standards for a hypothetical wind-up valuation unless

otherwise required by legislation, or

otherwise permitted by legislation and if called for by the terms of the engagement.

- .03 For example, in some jurisdictions,

the actuary may opine that the plan is solvent without making the valuation, but the actuary would then report the assumptions that he or she would use if making the valuation,

the actuary may reflect smoothing in the valuation of the plan's assets or the selection of the investment return assumption, or

the actuary may assume that wind-up does not trigger contingent wind-up benefits, provided that is consistent with the scenario that the actuary postulates and that the actuary also reports the scenario that would result in the highest wind-up liabilities, including a quantification of those liabilities.

- .04 Wind-up expenses may be ignored altogether in a solvency valuation if their inclusion would not decrease the solvency ratio below 100%. If included in the valuation, wind-up expenses would be deducted from the plan's assets in calculating the solvency ratio.

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3800 PENSION COMMUTED VALUES

3810 SCOPE

- .01 The standards in this section 3800 apply to an actuary's advice on the computation of commuted values, including commuted values to be paid from a pension plan that is registered under an Act when the method of settlement is a lump sum payment in lieu of an immediate or deferred pension resulting from death or individual termination of plan membership except for the specific circumstances which are described below in paragraph 3810.03. In particular, the standards in this section 3800 apply,
- in a jurisdiction whether or not there is legislation in that jurisdiction which specifically provides for portability of pension benefit credits,
 - regardless of limits imposed by the *Income Tax Act (Canada)* on amounts that may be transferred to other tax-sheltered retirement plans, and
 - under a reciprocal pension agreement between plan sponsors where the result of the reciprocal agreement is either to establish a pension amount determined on a defined contribution basis or to establish an account balance under a defined contribution provision of a plan, whether the account balance is to be converted immediately or subsequently into a pension.
- .02 The standards in this Section 3800 also apply to the determination of a lump sum payment from the pension plan in lieu of an immediate or deferred pension to which a plan member's former spouse is entitled after a division of the member's pension on marital breakdown.
- .03 The standards in this section 3800 do not apply,
- under a reciprocal pension agreement between plan sponsors where the result of the reciprocal agreement is to provide defined pension benefits for the plan member,
 - to the determination of commuted values of pensions and deferred pensions payable from pension arrangements that are not registered under an Act,
 - to the conversion of defined pension benefits to a defined contribution arrangement where there is no termination of active employment,
 - to the determination of commuted values of pensions that have commenced payment and where commutation is at the discretion of the member, except as explicitly required under 3810.02 or 3860.01, or
 - when calculating the capitalized value of pension benefits for actuarial evidence purposes, pursuant to Part 4000, where such value does not relate to a commuted value payable from a registered pension plan.

Act

.04 For the purposes of this section 3800, “Act” means a pension benefits standards act of a province or the federal government of Canada or the *Income Tax Act (Canada)*.

Retirement Compensation Arrangements

.05 As Retirement Compensation Arrangements (RCAs) are not required to be registered under the *Income Tax Act (Canada)*, this section 3800 applies to commuted values payable from an RCA only if the RCA is registered under a pension benefits standards act of a province or the federal government of Canada.

3820 METHOD

.01 *The commuted value should be independent of the financial position of the pension plan at the valuation date.*

.02 *The actuary should establish the period for which the commuted value applies before recomputation is required, taking into account the requirements of applicable legislation and the plan rules. Commuted values paid after the end of such period should be recomputed on the basis of a new valuation date.*

.03 *The commuted value should be adjusted for a reasonable rate of interest, taking into account the requirements of applicable legislation, between the valuation date and the first of the month in which the payment is made.*

.04 *The commuted value should reflect the plan member’s full benefit entitlement as a deferred or immediate pensioner, as may be applicable, determined under the terms of the pension plan. In the case of a deferred pensioner, the commuted value should include the value of the death benefit that would have applied before commencement of the deferred pension.*

.05 *The actuary should not calculate a commuted value using methods or assumptions that produce a commuted value smaller than the value computed in accordance with this section 3800. [Effective February 1, 2005]*

Valuation date

.06 The valuation date means the date as at which a value is being computed. Generally, this would be the date on which the plan member becomes entitled to an immediate or deferred pension resulting from death or individual termination of plan membership, or as of such other date as may be determined either by legislation, by the plan rules, or by a plan administrator who is empowered to do so, on which the right to receive a commuted value becomes effective.

.07 In the event that recomputation is required in accordance with this standard, the actuary would establish a new valuation date. The actuary would make calculations at the new valuation date in accordance with the standard in effect on the new valuation date.

Conditions attached to payment

.08 Applicable legislation or the plan provisions may attach conditions to the payment of a portion of the commuted value when the plan is less than fully funded on a plan termination basis.

Benefit entitlement

.09 Where, at the valuation date, a plan member has the right as a deferred or immediate pensioner, as may be applicable, to optional forms of pension or optional commencement dates, and where such right is contingent on an action which is within the member's control and where it is reasonable to assume that the member will act so as to maximize the value of the benefit, the option which has the greatest value would be used in the determination of the commuted value. For example, where a member has terminated employment and, upon application, is eligible for a particular benefit that has a value, it is reasonable to assume that, upon acquiring expert advice, the member will apply for the benefit.

.10 However, where such right is contingent upon an action which is within the member's control and where it is not reasonable to assume that the member will act so as to maximize the value of the benefit, an appropriate allowance would be made for the likelihood and timing of such action. For example, where a member is continuing in employment and is entitled to an unreduced pension that commences upon termination of employment, it may not be reasonable to assume that the member will immediately terminate employment in order to maximize the value of the benefit. In determining the likelihood and timing of such action, the actuary may use group data, and the actuary would be prepared to justify the allowance that has been made.

.11 The commuted value determined by the actuary using these assumptions made in accordance with the preceding paragraphs 3820.09 and 3820.10 may prove to have recognized certain potential entitlements that are never realized, or may prove to have disregarded certain entitlements that ultimately provide value.

Alternative methods and assumptions

.12 The actuary may calculate a commuted value on methods and assumptions that differ from those prescribed in this standard only if

the resulting value is larger, and

such value is required by the plan terms or applicable legislation, or by a plan administrator who is empowered to specify the basis on which commuted values are to be determined.

3830 DEMOGRAPHIC ASSUMPTIONS

.01 The demographic assumptions are the same for all types of immediate and deferred pensions.

- .02 *Except for situations specifically noted below, the actuary should assume, separate mortality rates for male and female members, and mortality rates equal to the UP-94 Table projected forward to the year 2015 using mortality projection Scale AA (UP-94@2015).*
- .03 *No adjustment should be made to reflect the health or smoker status of the member.*
- .04 *The current age of the plan member should be used when valuing an immediate pension.*
- .05 *If the plan provides a contingent benefit only to the person who is the plan member's spouse at the date of termination of membership, the actual age of the spouse, if any, should be used in the computation. If this information cannot be obtained, an appropriate proportion married and age difference between the plan member and spouse should be assumed.*
- .06 *Where the plan provides a contingent benefit to a plan member's spouse and a change in the member's marital status after the valuation date is relevant to the determination of the commuted value, the actuary should make an appropriate assumption concerning the likelihood of there being an eligible spouse, and the age of that spouse, at the time of death.*
- .07 *When valuing deferred pensions, including deferred pensions for a plan member who may also be entitled to an immediate pension, the normal retirement age should be used, except in the situation where the terminated plan member has the right to elect an earlier commencement date and the consequent early retirement pension exceeds the amount which is of actuarial equivalent value to the pension payable at normal retirement age. The retirement age should be determined in a manner consistent with paragraph 3820.09. [Effective February 1, 2005]*

Mortality

- .08 *The actuary would calculate commuted values that do not vary according to the sex of the plan member where the actuary is required to do so by applicable legislation or by the provisions of the plan or by the plan administrator if the administrator is so empowered by the provisions of the plan. In this case, the actuary would adopt a blended mortality approach by either developing a mortality table based on a combination of male and female mortality rates, or computing the commuted value as a weighted average of the commuted value based on male mortality rates and that based on female mortality rates. The relative proportions of males versus females would be appropriate for the particular plan.*
- .09 *If the requirement that commuted values do not vary according to the sex of the plan member is legislated and applies only to benefits earned after a particular date or only to a subgroup of plan members, the actuary may extend the use of a blended mortality approach to commuted values of benefits earned prior to such date or to commuted values of benefits of all members.*

3840 ECONOMIC ASSUMPTIONS

.01 *The actuary should select economic assumptions that vary depending on whether the pension is fully indexed, partially indexed or non-indexed.*

.02 *The actuary should select economic assumptions that depend on the reported rates for the applicable CANSIM series for the second calendar month preceding the month in which the valuation date falls.*

.03 *The actuary should calculate two interest rates, one applicable to the first ten years after the valuation date and the second applicable to all years thereafter.*

.04 *The commuted value of a fully or partially indexed pension should be at least equal to the commuted value applicable to a non-indexed pension in the same amount and having similar characteristics.*

.05 *The actuary should determine from the CANSIM series the following three factors:*

CANSIM Series	Description	Factor
B14070 (V122542)	7-year Government of Canada benchmark bond yield, annualized	i_7
B14072 (V122544)	Long-term Government of Canada benchmark bond yield, annualized	i_L
B14081 (V122553)	Long-term real return Government of Canada bond yield, annualized	r_L

Note that the factors provided do not reflect the reported CANSIM series, but the annualized value of the reported figure.

.06 *The actuary should also determine a fourth factor, calculated as follows:*

$$r_7 = r_L * (i_7 / i_L)$$

.07 *The actuary should determine the interest rates as follows:*

	Non-Indexed	Indexed
First 10 Years	$i_{1-10} = i_7 + 0.50\%$	$r_{1-10} = r_7 + 0.50\%$
After 10 Years	$i_{10+} = i_L + 0.5 * (i_L - i_7) + 0.50\%$	$r_{10+} = r_L + 0.5 * (r_L - r_7) + 0.50\%$

.08 *The actuary should calculate the commuted value of a non-indexed pension using a two tier interest rate of*

i_{1-10} for the first ten years and i_{10+} thereafter.

.09 *The actuary should calculate the commuted value of a pension which is fully indexed to increases in the Consumer Price Index using a two tier interest rate of*

r_{1-10} for the first ten years and r_{10+} thereafter.

.10 *For pensions that are partially indexed to increases in the Consumer Price Index, the actuary should determine the implied rates of increase in the Consumer Price Index in the first 10 years and thereafter that make the above assumptions for non-indexed and fully indexed pensions internally consistent. The actuary should then determine the rates of pension escalation that are produced by applying to those implied rates of increase in the Consumer Price Index the partial indexing formula of the plan. The actuary should determine the adjusted interest rates applicable to partially indexed pensions by appropriately reducing on a geometric basis the non-indexed rates of interest to reflect the rates of pension escalation.*

.11 *Where increases in pensions are related to increases in the average wage index, the actuary should assume that the average wage index will increase at rates that are one percentage point higher than the implied rates of increase in the Consumer Price Index.*

.12 *A pension that is indexed according to an excess interest approach involves increases that are linked to the excess of formula A over formula B, where A is some proportion of the rate of return on the pension fund or on a particular class of assets, and B is a base rate or some proportion of the rate of return on another asset class. In determining the interest rates under formula A and formula B, the actuary should use the interest rate applicable to a non-indexed pension as a proxy for the rate of return on the pension fund or on any particular asset class for which the rate of return is expected to be equal to or greater than the rate of return on long-term provincial bonds.*

.13 *Prior to calculating the commuted value, the actuary should round the rates of interest determined in accordance with this subsection 3840 to the nearest multiple of 0.25%. The actuary should round only the interest rates to be used in the calculation of the commuted value. The actuary should not round any rates of interest, increase or escalation used in calculations prior to the final step of the determination. [Effective February 1, 2005]*

Pension index frequency

.14 *For an indexed pension, the actuary would apply the indexed interest rates as determined above without adjustment only if the frequency of indexing is equal to the payment frequency. Reasonable approximations may be used to calculate an adjustment that takes into account the specific circumstances of the situation regarding payment frequency, indexing frequency, and time and amount of the first increase.*

Pension indexed on an excess interest formula

- .15 If the pension is indexed on an excess interest formula and the particular asset class is one for which the rate of return is expected to be less than the rate of return on long-term provincial bonds, the actuary would appropriately reduce the rate of interest to reflect the actuary's expectation of the difference between the rate of return on long-term provincial bonds and the rate of return on the particular asset class. In determining the expected rate of return on a particular asset class for this purpose, the actuary would be guided by the current economic environment as well as long-term historical experience.

Other modifications

- .16 Where benefit adjustments are based on one of the above approaches but are either modified by applying a maximum or minimum annual increase, with or without carry forward of excesses or deficiencies to later years, or modified by prohibiting a decrease in a year where the application of the formula would otherwise cause a decrease in pension, the actuary would adjust the interest rates otherwise applicable, based on the likelihood of the modification causing a material change in the pension payable in any year. In determining such likelihood, the actuary would be guided by the current economic environment as well as long-term historical experience. The actuary would be prepared to justify any such adjustment or lack of adjustment to the interest rates.
- .17 Where increases in benefits are not determined by reference to increases in the Consumer Price Index, the actuary should ensure that the commuted value is not inconsistent with the values of non-indexed pensions and fully indexed pensions.

Alternative calculation method

- .18 For pensions that are either fully or partially indexed, rather than using the implicit approach described above, the commuted value may be determined explicitly by indexing each expected payment based on the indexing rate that makes the assumptions for non-indexed and fully indexed pensions, prior to rounding under paragraph 3840.13, internally consistent.

3850 DISCLOSURE

- .01 *When communicating the amount of the commuted value of a member's pension, the actuary should provide,*

a description of the benefit entitlements involved,

a description of the actuarial assumptions used in determining the commuted value and the rate of interest to be credited between the valuation date and the date of payment,

a statement of the period for which the commuted value applies before recomputation is required,

when the payment of a portion of the commuted value is subject to a condition based on the financial position of the plan, the additional contribution required for the payment of the full commuted value to be made or the recommended schedule for payment of the balance of the commuted value, if applicable, and

a statement as to whether the commuted value has been computed in accordance with this standard of practice.

.02 *Where the commuted value has not been determined in accordance with this standard of practice, the actuary should clearly state that the calculation is not in compliance with this standard and disclose all areas of noncompliance and the reasons for the noncompliance.*

.03 *When communicating to the plan administrator an actuarial basis to be used in determining commuted values, the actuary should provide a statement that the actuarial basis is in accordance with this standard of practice.*

Disclosure of plan values which differ from this standard

.04 *In a situation where the use of commuted values (in this subsection 3850 called plan values), that are different from those computed in accordance with this section 3800, is required by the plan terms or applicable legislation, or by a plan administrator who is empowered to specify the basis on which commuted values are to be determined, the following disclosure requirements are applicable:*

if the plan values are lower, the actuary should disclose that the commuted values so calculated are in accordance with the plan or the applicable legislation but not in accordance with the standard, or

if the plan values are higher, the actuary should disclose that the commuted values so calculated are in accordance with the plan or the applicable legislation and the standard.

.05 *Where the actuary is required to calculate commuted values that do not vary according to the sex of the plan member, and where that requirement applies only to benefits earned after a particular date or only to a subgroup of plan members, the actuary should describe the extent to which the actuary's blended mortality approach has been extended to benefits earned before the particular date or to benefits of all members.*

.06 *Where the actuary uses assumptions or methods described in this standard to calculate a commuted value in a situation where this standard does not apply, the actuary should not state or imply that the commuted value has been computed in accordance with this standard.
[Effective February 1, 2005]*

3860 REDUCED LIFE EXPECTANCY

.01 The standard in this subsection 3860 applies to an actuary's advice on the computation of commuted values, from a registered pension plan, where the right to receive the lump sum is based on subsection 51.1 of the regulations to the *Ontario Pension Benefits Act*. This standard may also be applicable in other directly comparable situations.

.02 This standard does not apply where the right to receive a lump sum is not conditional upon medical certification, under legislation or plan provisions, even if the former member is known to be terminally ill.

.03 All standards set out in preceding sections of section 3800 apply, except as superseded by the following recommendations.

.04 *The commuted value should be calculated as of the date of the medical certificate specifying that the former member has life expectancy less than two years , even if other conditions for payment of the benefit (such as spousal consent) are not met until a later date.*

.05 *The commuted value should be adjusted for interest and benefits paid to the date of payment.*

.06 *The computation should not be adjusted to reflect the actual death or change in health of the former member after the valuation date. However, if a former pension plan member becomes eligible for immediate commencement of a pension after the date of the medical certificate and prior to payment of the benefit, this eligibility should be reflected in the calculation.*

.07 *If the former member is entitled to a commuted value transfer based on plan provisions or legislation that is not conditional on reduced life expectancy, the amount payable should be the greater of the amount calculated in accordance with this subsection 3860 and the amount computed in accordance with subsections 3820 through 3840 without regard to shortened life expectancy. [Effective February 1, 2005]*

Benefit Entitlement

.08 The commuted value would reflect the plan member's full benefit entitlement as a deferred or immediate pensioner, as may be applicable, determined under the terms of the pension plan.

There are three possible cases:

- (a) a former member with deferred pension entitlement, not eligible for immediate commencement of pension.

In this case, the commuted value would reflect the present value of the death benefits that would be payable in respect of the former member. For this purpose, the value of the death benefit would be calculated as of the valuation date, assuming the former member died as of the valuation date.

- (b) a former member with deferred pension entitlement, eligible for immediate commencement of pension.

In this case, the lump sum value would be the greater of the amount determined per (a) above and a value determined as if the individual had retired at the date of valuation and elected the most favourable combination of the highest surviving spouse pension permitted by the plan (if there is an eligible spouse) and the longest guaranteed period available under the plan. This value should be determined as for pensioners per (c) below.

- (c) a former member in receipt of pension.

In this case, the commuted value would reflect the present value of pension payments for a period certain of four months from the valuation date, any additional guaranteed payments and any survivor benefits potentially payable.

Disclosure

- .09 When communicating the amount of the commuted value of a member's pension, the actuary would also provide a description of the survival period assumption.

4000—ACTUARIAL EVIDENCE

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4100 GENERAL CONSIDERATIONS

4110 SCOPE

- .01 The actuarial evidence practice covers a broad range of technical advice to the courts, other tribunals and to the parties involved in legal actions. Such advice may include testimony as an expert witness.
- .02 Work as an expert witness often entails calculation of capitalized values, but will sometimes cover other matters.

4120 CAPITALIZED VALUES

- .01 Actuarial evidence practice frequently deals with the determination of the capitalized value of amounts for purposes of litigation or an agreement at law. These amounts are often payable in respect of an individual and sometimes in respect of a group of individuals. Such calculations must often be performed within a framework established by legislation and/or legal precedent.
- .02 Payment of the capitalized value is an alternative to payment of defined amounts to which an individual is entitled. Often the courts and others have recourse to payment of a capitalized value when payment of the amounts comprising that value is not practical or not desired.
- .03 Calculation of the capitalized value is within the domain of actuarial practice. The decision to have recourse to the capitalized value is outside the domain of actuarial practice.
- .04 A capitalized value relates to amounts payable at various times, each subject to various contingencies related to the individual or to the individual's dependants. Examples of such amounts are:

Event

Capitalized Value of the Individual's:

Disability	Loss of earnings, loss of household services and/or cost of extraordinary expenses attributable to the disability, also referred to as cost of future care.
Death	Dependants' loss of financial support and/or loss of household services.
Wrongful dismissal	Loss of earnings, pension benefits and/or employer-sponsored benefits other than pensions.
Marriage breakdown	Pension benefits, support obligations.
Reversion	Amounts payable on certain contingencies.

4130 METHOD

- .01 *The actuary should calculate the capitalized value of future amounts payable in respect of an individual by the actuarial present value method. [Effective January 1, 2004]*

Actuarial Present Value Method

- .02 It has been said that the laws of probability do not apply to an individual. That is partly correct. The laws of probability cannot be used to predict with respect to an individual. In a given year, for example, the expected rate of death for an individual is, say, .001, but that individual actually dies in that year at a rate which is either 1 or 0; i.e., either dies or does not die. We can predict only that, if there are, say, 1,000,000 similar individuals, then 1,000 of them, more or less, will die during the year. However, the actuarial present value method, fairly and reasonably, applies the laws of probability to an individual in order to calculate the capitalized value of amounts payable in respect of the individual. It must be recognized, however, that while the capitalized value may serve as a reasonable proxy to the series of payments for an *average* individual, it may be too much or too little for a *particular* individual. For example, a particular individual may live for a longer time, or be disabled for a shorter time, than an average individual. Thus, there will be, for a particular individual, either overcompensation or undercompensation. Under the actuarial present value method, the present value of possible overcompensation is balanced by the present value of possible undercompensation.
- .03 It is not appropriate to calculate the capitalized value of amounts subject to any contingent event as the present value of an annuity certain.

4140 FINANCIAL INTEREST OF THE ACTUARY

- .01 *The amount of the actuary's compensation should not be related to the outcome of the matter (e.g., litigation) in connection with which the work is done. The actuary may, however, reduce or waive his or her usual fee in hardship cases. [Effective January 1, 2004]*

4150 TESTIMONY

- .01 *The actuary's testimony should be objective and responsive. [Effective January 1, 2004]*
- .02 The actuary's role as an expert witness in court is to assist the court in its search for truth and justice, and the actuary is not to be an advocate for one side of the matter in a dispute.
- .03 In the course of testifying before the court, the actuary would:
- present a balanced view of the factors surrounding the actuarial aspects of the questions put to him or her,
 - answer all the questions that are asked on the basis of his or her own best assessment of all the relevant factors, and
 - apply best efforts to ensure that the testimony is clear, complete, that the information the actuary is providing will not be misunderstood or misinterpreted and that the audience will be able to use it correctly.

- .04 When responding to a direct question relating to any error or shortcoming the actuary perceives in the report of another actuary or expert witness, the actuary would respond candidly, notwithstanding paragraph 4160.05.

4160.05

4160 REPORTING: EXTERNAL USER REPORT

- .01 *The actuary should describe*
- the benefits to which the capitalized value applies,*
 - the assumptions and methods which are constrained by statute or case law,*
 - the data, method, and assumptions for the calculation, and*
 - the results of the calculation,*
- in sufficient detail to enable another actuary to approximately reproduce the calculations.*
- .02 *The report should:*
- include any applicable standard reporting language, and*
 - identify the person for whom the report was prepared and, if that person is acting on behalf of a party to the dispute, that party to the dispute. [Effective January 1, 2004].*

Reporting with Reservation

- .03 Stating that the reporting requirements have not been followed does not excuse an actuary from these reporting standards.
- .04 Reporting with reservation may relate to insufficient or unreliable data, or to the use of more approximate calculations than would normally be used due to time and expense constraints, but in no event shall reporting with reservation excuse an actuary from these reporting standards.

Disclosure of other expert's error

- .05 The external user report need not disclose any error or shortcoming which the actuary perceives in the report of another actuary or other expert witness.

1410.08
4150.04

4170 REPORTING: INTERNAL USER REPORT

- .01 *Unless an internal user report conforms to the recommendation for an external user report, an internal user report should contain a proviso that it not be given to an external user or be used in a court proceeding. [Effective January 1, 2004].*
- .02 For the purpose of determining if the actuary is following standards, an internal user report continues to be an internal user report even if, in breach of the proviso required by 4170.01, it is given to an external user or used in court. The actuary would draft any follow-up report as an external user report if a similar breach seems likely.

**4200 CAPITALIZED VALUE OF AMOUNTS FOR OTHER THAN
PENSION PLAN BENEFITS FOR A MARRIAGE BREAKDOWN**

4210 METHOD

Past Loss

- .01 In some cases, the capitalized value is the present value of amounts payable both before and after the date at which the capitalized value becomes payable. In an accident caused by negligence, litigation of the damages may result in the capitalized value becoming payable several years after the accident. The damages then consist of those in respect of both the period before and the period after the date at which the capitalized value becomes payable, called “past losses” and “future losses,” respectively.

Tax Calculations

- .02 The actuary would deal appropriately with income tax considerations, taking account of applicable law, ensuring that the whole of the actuary’s report deals with income tax in an internally consistent way, and fully disclosing assumptions and methods used in quantifying its impact.

Investment Expenses

- .03 Depending upon applicable law and the terms of the actuary’s engagement, an additional augmentation may be made to the initial fund, to allow for the present value of the expense of retaining advice or hiring an administrator, in connection with the management of the fund’s investments.

4220 CONTINGENCIES

- .01 The actuary should consider directly incorporating any material contingency where, in the actuary’s opinion, there are adequate legal, theoretical, or empirical supporting grounds to enable this. The actuary should disclose the omission from the model of any contingencies he or she considers material.

1530

- .02 *If the actuary gives advice on the impact of a contingency that is not incorporated in the model used, that advice should be based on an assessment of that contingency, both alone and in combination with other factors, using appropriate actuarial methods. [Effective January 1, 2004].*

- .03 The actuary’s report would show the results of the actuarial calculation based on the application of the model, and with any provision for other contingencies not incorporated in the model as a separate adjustment. For example, the results of the actuarial calculation may include precise recognition of only net investment return and mortality, and any other provision for contingencies reported as a separate adjustment.

- .04 The actuary would comment on every contingency that has been taken into account in making the calculations. The actuary would also state there may be other contingencies which could have a positive or negative impact and which have not been taken into account.

- .05 Recognition of a contingency may create a positive or negative impact on a calculation.

4230 ASSUMPTIONS

- .01 *The actuary's assumptions to calculate the capitalized value of amounts payable in respect of an individual should be best estimate assumptions unless there is a reason for biased assumptions. Except where the assumption is required by law, the actuary should report any such reason and the resulting bias.*
- .02 *The actuary should ensure that any assumptions selected by the client are plausible, taking account of applicable law, and that they do not conflict with prescribed assumptions.*
- .03 *In reporting, the actuary should identify which assumptions have been selected by the client.*
[Effective January 1, 2004]
- .04 Where there is insufficient data to support a particular assumption regarding a contingency incorporated in the model, the actuary may present results based on high and low estimates.
- .05 Requirement by law is a satisfactory reason for using a biased assumption.
- .06 If facts needed to make an appropriate assumption are lacking, then the actuary may report values for a helpful range of described assumptions.

4240 APPLICATION OF LAW

- .01 In a situation where statute or case law specifies a method or assumption to be adopted in an actuarial evidence calculation, a broad interpretation of accepted actuarial practice is applied, so that in most such situations the statute or case law specification is within the range of accepted actuarial practice.
- .02 If the actuary were unsure as to whether such a specification is accepted actuarial practice, he or she would consult with the chair of the Committee on Actuarial Evidence. 1310.01

4250 REPORTING: EXTERNAL USER REPORT

- .01 Here is model text if the actuary reports without reservation: 1610.02

I have determined the capitalized value of those aspects of the pecuniary damages described herein and prepared this report in accordance with accepted actuarial practice. It is my opinion that the assumptions and methods I have taken responsibility for are appropriate in the circumstances of this case and for the purpose of this report.

Respectfully submitted,

[actuary]

Fellow, Canadian Institute of Actuaries

**4300 CAPITALIZED VALUE OF PENSION PLAN BENEFITS
FOR A MARRIAGE BREAKDOWN**

4310 SCOPE

- .01 The standards in this section 4300 apply to an actuary's advice when the capitalized value of a pension plan's benefits is needed for calculating the value of family property at the breakdown of the marriage of a plan member.
- .02 For the purposes of this section 4300, "plan" means "pension plan" and is broadly defined, including not only a plan which is registered under the *federal Income Tax Act* but also an unregistered plan, such as a retirement compensation arrangement and an unfunded pension plan.
- .03 The standards in this section 4300 do not apply when the purpose of the calculation is to calculate an amount, in respect of a pension benefit to be paid:
- by the plan to the plan member or beneficiary as a result of the plan member's death or termination of membership, or
- by a party other than the plan in connection with litigation other than in respect of a marriage breakdown.
- .04 The standards in this section 4300 may provide useful guidance for corresponding calculations for other deferred compensation arrangements, such as a partnership retirement buy-out agreement, a sick leave buy-out plan, and a retirement lump sum allowance, but they do not provide useful guidance for current compensation arrangements such as group life and disability insurance.

4320 METHOD

- .01 *The benefits to be valued are the plan's benefits in respect of the member (including survivor benefits vested in the member's spouse) at the calculation date or calculation dates.*
- .02 *The value of the member's benefits is the capitalized value of the benefits to be valued, but assuming that the member has no spouse. The value of the survivor benefits vested in the member's spouse is the excess, if any, of*
- the capitalized value of the benefits to be valued over*
- the value of the member's benefits. [Effective January 1, 2004]*

Principle

- .03 The capitalized value would conform to the intent of applicable family law. The capitalized value may thus differ from the corresponding transfer value from a registered pension plan. Transfer values typically include only unconditional rights, whereas property under family law typically includes both vested and contingent rights. Thus, such contingent rights as early retirement rights, bridging benefits, and ad hoc inflation adjustments are property to be considered in a valuation for marriage breakdown purposes.
- .04 The standards in this section will often produce more than one result, by taking account of alternative possibilities for
- pension commencement age,
 - future increases in accrued benefits before and after retirement,
 - allocation of value earned before marriage,
 - inclusion or exclusion of non-vested benefits, or
 - special circumstances, such as buy-back or transfer of benefits.
- .05 If the actuary has reason to believe that the Plan's financial position is so weak that payment of the capitalized benefits is doubtful, then the actuary would so report, making clear that allowance for this factor could significantly reduce the present values calculated, given that such present values have been calculated assuming that the Plan would meet its obligations. In making that assessment, the actuary would take into account any benefits payable under provincial pension guarantee legislation. The actuary would further take into account the extent to which Plan benefits are provided through a retirement compensation arrangement and/or an unfunded pension plan.
- .06 The terms of the actuary's engagement may determine some or all of the following:
- the relevant law or jurisdiction,
 - the calculation date or calculation dates,
 - retirement age, but only if established as a matter of fact pursuant to an agreement of the parties or a determination by the court, and
 - inclusion or exclusion of the effect of income taxes.

Benefits to be valued

- .07 The benefits to be valued would include all of the plan's contractual benefits, including pre- and post-retirement death benefits, and any contractual inflation protection and non-contractual inflation protection.
- .08 The benefits to be valued would exclude spousal survivorship benefits, except to the extent that these may have vested upon retirement prior to the calculation date.
- .09 The form of plan benefits that would be valued would be the most favourable of any optional form available to the member with no spouse. For example, a 15-year guaranteed pension option would have a greater value than a 5-year guaranteed pension option for a member with impaired mortality. However, if the applicable law disregards a particular optional form of plan benefit, then the actuary may omit that option in calculating the capitalized value.
- .10 The benefits may include or exclude any non-vested benefits. Non-vested benefits may be included in the values, or illustrated separately, and would be valued without discount for the possibility of future forfeiture. Separately from the illustrated values, the report may contain comments including suggestions for recognizing the contingent nature of non-vested benefits.

The references in this paragraph to inclusion of values of non-vested benefits apply in jurisdictions where the inclusion of such values depends on the plan provisions applicable to a deferred vested member. In other jurisdictions, the inclusion of such values depends on the extent to which continued employment is assumed.

- .11 The capitalized values would include ancillary benefits which are provided by the plan as of the calculation date and are expected to become available to the member after the calculation date if the plan member continues as an active member of the plan, but are not available to the member as of the calculation date, such as unreduced early retirement benefits.
- .12 The actuary would disclose whether or not the benefits valued include benefits that will be provided by the plan after the calculation date and that are expected to become available to the member after the calculation date if the plan member continues as an active member of the plan, but are not available to the member as of the calculation date, for example
- a future increase in benefits as a result of a collective bargaining agreement, or
 - a future increase in benefits as a result of an adopted plan amendment.
- .13 The benefits referred to in paragraph .11 are those payable by the plan as a going concern, and not those payable on plan wind-up, if different.
- .14 Where various legal interpretations for a specific question appear possible, the actuary would obtain clarification of such unclear matter from the instructing lawyer or from another authoritative source. If that is not possible, the actuary would provide a description of any conflicting viewpoints and report either values that represent both possible interpretations, or values that, in the actuary's opinion, are most consistent with accepted actuarial practice.

Calculation date

- .15 The calculation date may be single or multiple, depending on the circumstances and applicable law. The possibilities include
- the date of separation,
 - the date of marriage or commencement of cohabitation,
 - the date of trial, and
 - the report date.
- .16 If the selection of an alternative nearby calculation date would significantly affect the capitalized value, then the actuary would so report. Examples are
- the date at which the member becomes eligible for early retirement with unreduced benefits, and
 - the date at which the plan is amended to enhance its benefits.

Applicable standards

- .17 The applicable standards are those in effect at the calculation date. If there are two or more calculation dates, however, and if the standards applicable to one differ from the standards applicable to another, then the actuary would use the same standards for all calculation dates. The choice of standards would be governed by the latest of the calculation dates, except that the choice would be governed by the base calculation when the actuary selects an alternative nearby calculation date in accordance with the previous paragraph.

Future service

- .18 If the member's employment terminated before the calculation date and was not reinstated at the report date, then the actuary would include nothing in the capitalized value on account of assumed service after the calculation date, even if reinstatement is possible after the report date. The actuary may, however, report a useful alternative calculation, which assumes reinstatement.
- .19 If the member's employment terminated between the calculation date and the report date and was not reinstated at the report date, then the actuary may, with disclosure, exclude from the capitalized value any non-vested benefits forfeited by the termination of employment.

Effect on capitalized value of minimum benefits

- .20 In calculating the capitalized value, the actuary would take account of any minimum benefit related to member contributions, for example:
- the so-called "50% minimum employer contribution rule", and
 - a minimum benefit equal to the member's contributions accumulated with interest.

- .21 The minimum benefit would not necessarily be limited only to the value determined on a termination of employment assumption. The capitalized value would incorporate the relevant minimum benefit rule according to the event.

Effect on capitalized value of salary increases after the calculation date

- .22 If the pension is an earnings-related benefit, then the possibilities are as follows:

The capitalized value takes account of all the member's salary increases – general increases, promotional increases, and seniority increases – after the calculation date.

The capitalized value takes account of the member's salary increases which result from general (as opposed to promotional and seniority) salary increases after the calculation date. A rationale for this possibility is that the member's spouse has no entitlement to the effect of promotions or seniority increases, which the member earns after the calculation date.

The capitalized value does not take account of the member's salary increases after the calculation date. A rationale for this possibility is that the member's spouse has no entitlement to the effect of salary increases, which depend on the member's continued employment after the calculation date.

- .23 The assumed salary increases after the calculation date would be consistent with the prescribed economic assumptions, except that salary increases revealed by subsequent events would be substituted for the corresponding assumed increases.

Effect on capitalized value of non-contractual indexing of pensions and other benefit adjustments

- .24 In calculating the capitalized value, the actuary would assume continuance of the plan's established practice or current policy, if any, for non-contractual indexing for inflation of pensions after pension commencement age and of vested deferred pensions before pension commencement age, unless there is explicit reason not so to assume. The actuary would report

the established practice or current policy, and

the assumption.

- .25 If that assumption is doubtful, then the actuary would also report the numerical effect on the capitalized value of helpful alternative assumptions.

- .26 In the case of a final or best average earnings plan, there should be no allowance made for indexing of vested deferred pensions before pension commencement age in the period for which salary increases are projected after the calculation date.

Effect on capitalized value of income tax

- .27 Income tax may be taken into account in the calculation. If it is to be taken into account, then the actuary would do so by calculating the average income tax rate based upon the member's anticipated retirement income computed in "current" dollars, including accrued and projected future pension income, Canada Pension Plan, Old Age Security and other anticipated income, and continuance of the tax environment at the report date or the calculation date; i.e., assuming continuation of the existing tax rates, brackets, surtaxes and clawbacks, applied to the projected income on retirement expressed in "current" dollars. The actuary would disclose which date was used and if the tax environment is as at the report date, disclose the use of any tax provisions that have not yet been enacted.
- .28 The actuary may report useful alternative calculations, which take income tax into account.

4330 ASSUMPTIONS

- .01 *The actuary should select all assumptions, except those depending upon interpretation of applicable law. [Effective January 1, 2004].*

Death rates

- .02 *The actuary should assume death rates in accordance with a mortality table prescribed by the Practice Standards Council for the purpose of these calculations, modified, if appropriate, to reflect the member's or the member's spouse's impaired health, if medically determinable. [Effective January 1, 2004]*
- .03 Tobacco use (or lack of tobacco use) would not, in itself, be sufficient reason to modify the above-described death rates.
- .04 Use of unisex death rates would not be appropriate except that it may be appropriate in situations where the plan member has terminated employment and has elected or has the option to elect a transfer value.

Retirement age

- .05 If the retirement age is a matter of fact (i.e., one agreed by the parties or determined by the court), then the actuary would report the selection of the assumed retirement age as such.
- .06 The retirement of the member before the report date does not necessarily preclude assumption of a different retirement age.
- .07 Unless paragraph .05 applies, the actuary would usually assume and report the results for a range of useful retirement ages, based on data at the calculation date, which would include

the earliest age at which the member is entitled to a pension whose amount is not reduced on account of early retirement, assuming that the member's service ceases at the calculation date,

the earliest age at which the member is entitled to a pension whose amount is not reduced on account of early retirement, assuming that the member continues in service either to that age or to an earlier age after the calculation date,

if there is an upper limit to the number of years of credited service, the earliest age at which the member has attained, or will attain, that upper limit and becomes entitled to a pension whose amount is not reduced on account of early retirement, and

the normal retirement age.

Valuation interest rates

- .08 The choice of valuation interest rate would vary depending on whether the pension is non-indexed, partially indexed, or fully indexed.
- .09 The index may be the Consumer Price Index (CPI), a wage index, an index based on an excess interest method, or a modification or a mixture of these indices.

Pension which is non-indexed

- .10 The valuation interest rate during the 15 years following the calculation date is the month-end value of the nominal interest rate (i.e., the rate compounded semi-annually) on long-term Government of Canada bonds (CANSIM series B14013) in the second calendar month preceding the month in which the calculation date falls, adjusted as follows:
 - add 0.5%,
 - convert the resulting nominal interest rate to the equivalent effective annual interest rate, and
 - round to the nearest integral multiple of 0.25%.
- .11 The valuation interest rate after those 15 years is 6%.

Pension which is indexed to the CPI

- .12 The valuation interest rate during the 15 years following the calculation date is the month-end value of the real interest rate (i.e., the rate compounded semi-annually) on long-term Government of Canada real return bonds (CANSIM series B14081) in the second calendar month preceding the month in which the calculation date falls, adjusted as follows:
 - add 0.25%,
 - convert the resulting nominal interest rate to the equivalent effective annual interest rate, and
 - round to the nearest integral multiple of 0.25%.
- .13 The valuation interest rate after those 15 years is 3.25%.

Pension which is indexed to a wage index

- .14 If a pension is indexed to the rate of change in a wage index, the valuation interest rate would be 1% less per annum than the rate determined for CPI indexing under paragraphs 4330.12 and 4330.13

Pension which is ad hoc indexed

- .15 For a pension in a plan which has a policy or a history of ad hoc indexing, the actuary shall determine a valuation interest rate based on an assumed rate of indexing determined in accordance with paragraph 4330.18. 4330.18

Other Adjustments

- .16 The capitalized value of a fully- or partially-indexed pension would be adjusted, if necessary, to be as large as the corresponding value of an otherwise similar non-indexed pension. That adjustment may be necessary if the indexing decreases the pension.
- .17 The indexing in any of the above arrangements may be modified by
- applying a maximum or minimum annual increase, with or without carry forward of excesses or deficiencies to later years, or
 - prohibiting a decrease in a year where the application of the formula would otherwise cause a decrease. The actuary would then adjust the interest rate for a year to reflect the probability and extent of modification for that year. In so doing, the actuary would take account of long-term historical averages and not give undue weight to recent experience.
- .18 If the pension is indexed to the CPI on some basis other than the full CPI, the capitalized value would be reasonably related to the capitalized value for pensions which are non-indexed and which are indexed to the CPI.
- .19 If the pension is indexed using an “excess investment return” approach, the valuation interest rate would usually be the lesser of the “floor rate” and the valuation interest rates determined under paragraphs 4330.10 and 4330.11.

Assumptions selected by client

- .20 The actuary would obtain instructions from the client with respect to assumptions dependent upon the interpretation of applicable law.
- .21 The actuary would report his or her reliance on an assumption selected by the client.

4340 REPORTING: EXTERNAL USER REPORT

.01 Here is model text if the actuary reports without reservation with regard to marriage breakdown:

I have determined the capitalized value of the pension benefits and prepared this report in accordance with accepted actuarial practice, for purposes of settlement of a division of pension benefits resulting from marriage breakdown under the [Family Law Act] of [province]. In my opinion, the capitalized values are appropriate for this purpose.

Respectfully submitted,

[actuary]
Fellow, Canadian Institute of Actuaries

4400 COMPUTATIONS OF CRIMINAL RATE OF INTEREST

4410 SCOPE

- .01 *The standards in section 4400 apply to an actuary's advice when determining whether the interest rate for a particular agreement or arrangement is a "criminal rate". [Effective January 1, 2004].*
- .02 *The Criminal Code of Canada defines "criminal rate" as meaning an effective annual rate of interest calculated in accordance with generally accepted actuarial practices and principles that exceeds sixty percent on the credit advanced under an agreement or arrangement.*

4420 DATA

- .01 *The actuary should ascertain or make assumptions regarding the quantum and timing of all amounts actually or deemed to be advanced as well as all amounts actually or deemed to be repaid either as principal or as "interest" as defined in the Criminal Code.*
- .02 *All data used in the calculation, and their sources, should be reported. [Effective January 1, 2004]*
- .03 *Data which are not clear from the initial terms of the assignment would require clarification from the actuary's client (for example, whether or not a particular item falls within the statutory definition of "interest," or the timing of a particular payment that could be made on various alternate dates).*

4430 METHOD

- .01 *The actuary should calculate and report the effective rate of interest compounded annually "i" such that the following equality is established.*

$$\sum_{r=1}^m A_r \times (1+i)^{t_r} = \sum_{s=1}^n B_s \times (1+i)^{t_s}$$

where:

m is the total number of payments advanced by the lender to the borrower.

n is the total number of payments repaid by the borrower to the lender.

A_r is the amount of the rth payment advanced by the lender.

B_s is the amount of the s^{th} payment repaid by the borrower, consisting of principal, “interest” as defined, or a combination of both.

t_r is the period measured in years (including fractional parts of a year) between the time that the r^{th} payment is advanced by the lender to the borrower and the time on which the final repayment is made by the borrower to the lender.

t_s is the period measured in years (including fractional parts of a year) between the time that the s^{th} payment is repaid by the borrower to the lender and the time on which the final payment is made by the borrower to the lender. [Effective January 1, 2004]

- .02 If the calculation produces only one result, then the actuary would report that result. If the calculation produces more than one result, then the actuary would report only those which are positive and real.
- .03 The formula in paragraph 4430.01 applies in most but not all situations.

5000—PUBLIC PERSONAL INJURY COMPENSATION PLANS

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5100 SCOPE

- .01 The standards in this part apply to an actuary's advice on the financial position or financial condition or the pricing of benefits of the following public personal injury compensation plans:

A public workers' compensation system (including its self-insured elements and self-insured employers), and

The *Société de l'assurance automobile du Québec* (SAAQ).

- .02 The standards in this part apply to pricing to the extent that work on pricing depends upon the valuation of benefits. They do not apply to those components of pricing of benefits that are not determined on the basis of an actuary's advice.
- .03 The standards in this part do not apply if the purpose of the valuation for self-insured employers is to account for the plan in the financial statements of the employer.

5200 EXTENSION OF SCOPE

- .01 The standards in this part may also provide useful guidance in the case of a public personal injury compensation plan outside their scope

whose benefits are compulsory for all or virtually all of its users,

which enjoys either a monopoly or a call on government support if its own resources are insufficient, and

whose benefits are statutory, as opposed to contractual.

- .02 The standards in this part do not, however, provide useful guidance in the case of a mere monopoly, such as a monopoly of benefits which are optional or a government monopoly which is expected to operate like a private sector entity.

5300 VALUATION OF BENEFITS LIABILITIES

- .01 *The value of benefit liabilities is the value, by the actuarial present value method, of cash flow after the calculation date on account of claims incurred before that date. [Effective December 1, 2002]*

Assumptions

- .02 *The assumptions for valuation of benefit liabilities should take account of the plan's policy for*

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pricing stability,

smoothing of short-term deviations from the secular trend, and

equity among generations of users,

and may differ from the corresponding assumptions for valuation of an insurer's policy liabilities due to the plan's compulsory coverage and monopoly powers.

- .03 *Those assumptions should also take account of*

expected ad hoc indexing of benefits,

the intermittence of income replacement and rehabilitation benefits as a result of remission and relapse which make those benefits continual throughout life, and

variation in settlement patterns which result from virtually definitive revisions to the plan's benefits or claim practices or changes in economic conditions.

- .04 *The actuary should consider any incomplete funding of the benefit liabilities in selecting the economic assumptions. [Effective December 1, 2002]*

Current and prior assumptions

- .05 *The actuary should report an inconsistency if the current assumption differs nominally from the corresponding prior assumption. Provided, however, that a current assumption which differs nominally from the corresponding prior assumption is consistent with that prior assumption if both are calculated by the same method; for example, a four-year moving average method would not constitute an inconsistency. [Effective December 1, 2002]*

5400 REPORTING: EXTERNAL USER REPORT

- .01 The standards in this section apply to an actuary's report other than a report in a public personal injury compensation's published financial statements which are in accordance with generally accepted accounting principles.
- .02 *In the case of an external user report on work which includes a valuation of benefits liabilities, the actuary should summarize the result of the valuation and describe*
- the Act or other authority under which the valuation is made,*
- the methods and assumptions selected for the valuation of liabilities,*
- if the work includes a valuation of assets, then the method and assumptions used to value them,*
- the funding of the benefits and its effect on the selection of assumptions,*
- the gains and losses, including their quantification, between the prior calculation date and the calculation date, and*
- the matters which require particular monitoring until the next valuation.*
- .03 *If the benefit liabilities make no provision for administration expenses or for future claims arising from latent occupational disease, then the report should so disclose.*
- .04 *The report should disclose the treatment of liabilities for self-insured employers.*
- .05 *If the benefit liabilities make provision for adverse deviations, then the report should so disclose.*
- .06 *The report should be detailed enough to enable another actuary to examine the reasonableness of the valuation. [Effective December 1, 2002]*

6000 – POST-EMPLOYMENT BENEFIT PLANS

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6100 SCOPE

- .01 The standards in this part apply to an actuary's advice on the financial position or financial condition of a post-employment benefit plan which provides benefits other than retirement income to the plan's members and their covered spouses and dependants, whether funded or not, whether insured or not, and whether in the private or public sector, except
- a plan within the scope of part 3000 or part 5000,
 - a plan that provides benefits based on the accumulation of a defined amount during the period of employment to the extent that the benefits provided are defined by the exact amount of accumulated assets (i.e., a pure defined contribution plan). This part applies, however, to any hybrid of defined contribution and defined benefit plans,
 - a plan whose benefits are guaranteed by an insurer, and
- Social Security programs like the Canada Pension Plan and the Québec Pension Plan.
- .02 For the purpose of this part, a post-employment benefit plan is any arrangement, whether funded or unfunded, whereby a plan sponsor undertakes to provide members with benefits to which they become entitled when no longer actively at work (for example, post retirement life insurance, extended health and dental coverage, non-lifetime retirement allowance, subsidized purchases, health and dental care spending accounts, short-term and long-term disability, workers compensation, maternity or paternity leave, accumulated sick leave or vacation pay). Benefits may commence immediately or may be deferred until former employees satisfy the eligibility requirements (for example, age and/or length of service).
- .03 An actuary's advice on the financial position or financial condition of a post-employment benefits plan may relate to items such as
- its funding,
 - the application to its funding of any regulatory limitations,
 - its financial statements,
 - its accounting in the plan sponsor's financial statements, or
 - the value to be placed on the plan's assets and liabilities in a corporate reorganization or in an agreement of purchase or sale.

6200 DATA AND PLAN PROVISIONS

- | | | |
|-----|---|-------------------------------|
| .01 | In addition to the current plan membership and asset data, information on historical claims experience, including nature of absence and benefit levels are, in most cases, necessary for the valuation. Data may come from the plan sponsor or other sources, such as insurance carriers, brokers or <u>plan administrators</u> . | 1450.01
1530.01
1710.10 |
| .02 | In identifying the data needed, the actuary would bear in mind that the pertinent benefits are those applicable during retirement or while the member is not actively at work but not yet retired. Where appropriate, the actuary would obtain claims data split by plan, by age, by location, by status (retiree, inactive, spouse, other dependent) and by type of expense (drug, hospital, etc.) | 1530.02 |
| .03 | The actuary would obtain plan documents including funding and underwriting arrangements, collective bargaining agreements and other information regarding past practices, cost sharing arrangements between the sponsors and the plan members, and communication between the plan sponsor and the members. This is used to determine the plan provisions with sufficient accuracy for the purposes of the valuation. Prior plan provisions may be needed to analyse claims information prior to the valuation date. | 1530.10
1730.08 |
| .04 | The actuary would also determine whether there were any changes in the current plan provisions or practices which were provided contractually on the valuation date, but which were scheduled to take effect at a future date. | 1730.02 |

6300 METHODS AND ASSUMPTIONS
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.01 *The actuary should select an asset valuation method and an actuarial cost method which are appropriate for the purpose and circumstances of the work. The assumptions used to value liabilities should be consistent, where applicable, with the asset valuation method selected.*

.02 *The assumptions for a valuation of the liabilities of non-earnings-related post-employment benefit plans should reflect projections of the costs of such plans based on current levels and estimates of future changes in such levels until the coverage is expected to cease, if relevant to the actuarial cost method selected by the actuary.*

1730.11
1730.17

.03 *The assumptions for a valuation of the liabilities of earnings-related post-employment benefits plans should include an assumption about members' future earnings, if relevant to the actuarial cost method selected by the actuary. [Effective June 1, 2005]*

Assumption with Respect to Changes in Government Programs

.04 The actuary would usually assume the continuation of the current provisions and practices of government programs, but anticipate the effect of legislative changes scheduled to be implemented at a future date. The actuary may also wish to present different scenarios of the future. If the purpose of the valuation is such that the impact of anticipated future government changes is to be taken into account, the actuary would make appropriate assumptions in respect thereof.

1730.02
1730.28-.30

Assumption with Respect to Benefit Cost Factors

.05 In determining initial claims cost, the actuary would consider available claims experience with regards to:

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claimant age, member status, coverage category and benefit type, and

credibility and relevancy to future periods and future benefit provisions.

.06 Historical claims data would be adjusted to reflect the inflation in the cost of benefits between the reference period and valuation date unless this is not appropriate for the particular plan design. Where appropriate, the actuary would also adjust past experience results to reflect nonrecurring influences such as changes in the benefits offered, significant changes in the demographics of the group, changes in government programs, or unusual claims.

.07 Available data may be of limited value or have low credibility. Where the benefit cost for former members or current retirees is not fully credible or does not reasonably represent the likely benefit cost for similar future groups, the actuary may rely on the experience of active members or other sources of data that the actuary considers reasonable and relevant. However, such data should be adjusted appropriately for expected differences between the retiree group and the group from which it is drawn.

Assumption with Respect to Claims Trend Rate

.08 The assumption with respect to future claims trend rate would usually be based on the level experienced in the recent past. The trend rate assumption would be consistent with the assumption regarding future changes in benefit programs and general economic conditions. If no change to future benefit programs is expected, then the trend rate experience would be modified by removing the impact of previous benefit program changes.

6400 FUNDING

.01 The standards in this section apply to advice on funding a plan. For the purposes of this section, advice on funding includes accumulation of assets in respect of post-employment benefits. Advice on funding does not necessarily include advice on the effect of a proposed change to a plan, and does not necessarily include advice on accounting as described in section 6500.

.02 *The actuary's advice on funding should take account of the objectives of funding and of the relationship between the plan's assets and liabilities.*

.03 *The actuary's advice on funding should take account of the plan's benefits at the calculation date, except that, subject to disclosure, such advice*

if pertinent to the terms of engagement, may anticipate an expected amendment to the plan, and

in respect of funding between the calculation date and the effective date of a pending amendment to the plan, may disregard that amendment.

.04 *The actuary's advice on funding should cover at least the period between the calculation date and the next calculation date.*

.05 *The actuary's advice on funding may allow a range of contributions and a range of target funding levels. [Effective June 1, 2005]*

Anticipated funding of expected amendment

.06 The actuary's advice on funding may, subject to disclosure, anticipate an expected amendment to the plan that increases its benefits. For example, the employer may have a regular pattern of increasing the dental fee schedules that the plan uses as its benefit limit. The actuary's advice may anticipate continued adoption of such increased limits.

Deferred funding of pending amendment

.07 If, at the calculation date, an amendment to the plan is definitive or virtually definitive, and if the effective date of the amendment is

during the period for which the report gives advice on funding, then the advice on funding up to that effective date may disregard the amendment, but the advice on funding thereafter would take the amendment into account, or

after the period for which the report gives advice on funding, then that advice may, subject to disclosure, disregard the amendment.

.08 "Effective date of the amendment" is the date at which the amended benefits take effect, as opposed to the date at which the amendment becomes definitive.

Next calculation date

- .09 The next calculation date would be the latest date which would be appropriate for the next valuation.

6500 ACCOUNTING

- .01 The standards in this section apply to advice on accounting for a plan's costs and obligations in the plan sponsor's or the plan's financial statements.
- .02 *If called for by the engagement, the actuary should select methods and assumptions for the valuation of assets and liabilities that are appropriate to the basis of accounting in the plan sponsor's or plan's financial statements, as applicable.*
- .03 *The assumptions that the actuary selects should be best estimate assumptions.*
- .04 *With respect to the assumptions, the actuary should report one or more of the following:*
the preparers of the financial statements have selected the assumptions and the actuary expresses no opinion on them,
the preparers of the financial statements have selected the assumptions and they are, or are not, in accordance with accepted actuarial practice, or
the actuary has selected the assumptions and they are in accordance with accepted actuarial practice. [Effective June 1, 2005]
- .05 The actuary would reflect the accounting standards specified by the terms of the engagement. For work in Canada, the Canadian Institute of Chartered Accountants (CICA) Handbook and other CICA guidance usually would be specified. In particular, if the actuary is aware at the time of preparation of the report of any subsequent event that makes the entity a different entity after the calculation date, the actuary would report an estimate of the financial effect of such subsequent event, or in the rare circumstance that it is impractical to make such an estimate, include a statement to that effect.
- .06 If the preparers of the financial statements select the assumptions and they are not in accordance with accepted actuarial practice, Rule 6 may apply. That is so whether or not the actuary expresses an opinion on the assumptions.
- .07 The actuary may use prior valuation results along with an extrapolation technique, rather than conduct a new valuation. If the prior valuation date is three or more years earlier than the current valuation date, the actuary would not usually extrapolate from prior valuation results.

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6600 REPORTING: EXTERNAL USER REPORT
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.01 *In the case of an external user report on work that includes a valuation of assets (which may be zero) and liabilities, the actuary should summarize the result of the valuation and should describe*

the source and verification of data with respect to members, plan provisions, and assets, and the date at which they were compiled,

the data with respect to members,

the plan's provisions, including cost-sharing provisions and the identification of any expected amendment that has been valued,

the method and assumptions for valuation of the liabilities,

the data used to determine initial claims costs, and

the method to value the assets, their value, and, if available, their market value and their value in the plan's financial statements, and an explanation of any differences among them.

.02 *If the valuation includes no provision for adverse deviations, the actuary should say so and say why.*

.03 *If the report gives advice on funding, then the actuary should*

if recommending contributions, then describe their determination between the calculation date and the next calculation date,

if contributions are fixed, either

report that the contributions are adequate to fund the plan, or

report the required increase in contributions, the required reduction in benefits, or the combination thereof that will address the funding shortfall,

name the next calculation date,

disclose any pending but definitive or virtually definitive amendment, the funding of which has been deferred beyond the next calculation date, and

describe and quantify the gains and losses between the prior calculation date and the calculation date.

- .04 *If the report gives advice on accounting, then the actuary should*
- describe the method and period selected in connection with any amortization of benefit costs,*
 - if the valuation is an extrapolation of an earlier valuation, then describe the method and any assumptions for, and the period of, the extrapolation,*
 - state whether or not the valuation is in conformity with the accounting standards specified by the terms of the engagement, and*
 - provide the disclosures required under paragraph 6500.04.*

- .05 *The report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation.*

Statements of Opinion

- .06 *If the report gives advice on funding, then the actuary should provide the following four statements of opinion, all in the same section of the report and in the following order:*
- 1. a statement as to data, which should usually be as follows: “In my/our opinion, the data on which the valuation is based are sufficient and reliable for the purpose of the evaluation.”,*
 - 2. a statement as to assumptions, which should usually be as follows: “In my/our opinion, the assumptions are, in aggregate, appropriate for the purpose(s) of...”,*
 - 3. a statement as to methods, which should usually be as follows: “In my/our opinion, the methods employed in the valuation are appropriate for the purpose(s) of...” , and*
 - 4. a statement as to conformity, which should be as follows: “This report has been prepared, and my/our opinions given, in accordance with accepted actuarial practice.” [Effective June 1, 2005]*
- .07 *Where different statements of opinion apply in respect of different purposes of the valuation, the above requirements may be modified but would be followed to the extent practicable.*
- .08 *While a separate statement as to assumptions would generally be included in respect of each purpose of the valuation, the statements as to assumptions may be combined where the statements do not differ among some or all of the valuation’s purposes. The report would clearly indicate which statement as to assumptions applies to each of the valuation’s purposes.*

- .09 While a separate statement as to methods would generally be included in respect of each purpose of the valuation, the statements as to methods may be combined where the statements do not differ among some or all of the valuation's purposes. The report would clearly indicate which statement as to methods applies to each of the valuation's purposes.

Data

- .10 The description of verification of data would include a description of the main tests of the data's sufficiency and reliability and of any assumptions made in respect of insufficient or unreliable data.

Assumptions

- .11 The description of assumptions would include a description of each nominal change to the assumptions of the prior valuation and a quantification of its aggregate effect. However, if a plan amendment prompts the actuary to change the assumptions, the actuary may report the combined effect of the amendment and the resultant change in assumptions.

Methods

- .12 The description of the method to value the assets would include a description of any change to the method of the prior valuation and a quantification of the effect of the change.
- .13 The description of the actuarial cost method would include a description of any change to the method of the prior valuation and a quantification of the effect of the change.
- .14 For a funding valuation, the description of the actuarial cost method would include a description of
- the effect of the selected actuarial cost method on the security of benefits and on the pattern of future contributions,
- the options with respect to any shortfall or excess of assets over liabilities, and
- any anticipated or deferred funding, and a quantification of its financial effect on the value of benefits and on the pattern of future contributions.