



Actuarial Standards Board  
Conseil des normes actuarielles

# Standards of Practice

**February 2018**

Ce document est disponible en français

## 1000—General

## Table of Contents

<b>1000 – General.....</b>	<b>1002</b>
<b>1100 Introduction</b>	<b>1004</b>
1110 Application .....	1004
1120 Definitions .....	1004
1130 Interpretation.....	1011
1140 Judgment.....	1012
1150 Accepted actuarial practice.....	1013
1160 Scope .....	1014
<b>1200 Permitted Deviations</b>	<b>1016</b>
1210 Conflict with law.....	1016
1220 Conflict with terms of engagement .....	1016
1230 Unusual and unforeseen situations .....	1017
1240 Materiality.....	1017
<b>1300 The Engagement</b>	<b>1021</b>
1310 Accepting and continuing an engagement .....	1021
1320 Financial interest of the actuary .....	1023
1330 Financial interest of the client or employer.....	1023
1340 General knowledge .....	1024
1350 Knowledge of the circumstances affecting the work .....	1024
<b>1400 The Work</b>	<b>1026</b>
1410 Approximation.....	1026
1420 Event.....	1028
1430 Subsequent events.....	1029
1440 Data .....	1033
1450 Models.....	1034
1460 Control.....	1036
1470 Reasonableness of result .....	1037
1480 Documentation .....	1038
<b>1500 Another Person’s Work</b>	<b>1039</b>
1510 Actuary’s use of another person’s work .....	1039
1520 Auditor’s use of an actuary’s work .....	1040
1530 Review or repeat of another actuary’s work .....	1047

<b>1600</b>	<b>Assumptions and Methods</b>	<b>1051</b>
1610	Methods .....	1051
1620	Assumptions .....	1051
1630	Provision for adverse deviations.....	1057
1640	Comparison of current and prior assumptions.....	1057
<b>1700</b>	<b>Reporting</b>	<b>1059</b>
1710	Reporting: external user report .....	1059
1720	Reporting: internal user report .....	1066
1730	Reporting: oral report .....	1067
1740	Summary report .....	1067

## 1100 Introduction

### 1110 Application

- .01 These Standards of Practice apply to actuarial work in Canada. Responsibility for these Standards of Practice vests in the Actuarial Standards Board (Canada) and approval of standards and changes to standards are made through a process that includes consultation with the actuarial profession and other interested parties. They are intended for the benefit of the public. The work in Canada of a member of a professional actuarial organization is expected to conform to these Standards of Practice.
- .02 The existence of standards is not a substitute for professional judgment or consideration for the needs of the user(s) when performing specific work.
- .03 The authority of these Standards of Practice derives from the powers of those bodies that recognize them for actuarial work in Canada. Among others, these include professional actuarial bodies and relevant laws such as those regulating pensions and insurance. Compliance with these Standards of Practice is also likely to be taken into account when the quality of actuarial work is being considered in a court of law or in other contested situations. However, in such circumstances, deviation from any provision of these Standards of Practice should not, in and of itself, be presumed to be malpractice.

### 1120 Definitions

- .01 Each term set over dotted underlining has the meaning given in this subsection. A term that is not set over dotted underlining has its ordinary meaning.
- .02 Accepted actuarial practice is the manner of performing work in accordance with these Standards of Practice. Unless the context requires otherwise, it refers to work in Canada. [*pratique actuarielle reconnue*]
- .03 Actuarial cost method is a method to allocate the present value of a benefit plan's obligations to time periods, usually in the form of a service cost and an accrued liability. [*méthode d'évaluation actuarielle*]
- .04 Actuarial evidence work is work where the actuary provides an expert opinion with respect to any area of actuarial practice in the context of an actual or anticipated dispute resolution proceeding, where such expert opinion is expected or required to be independent. A dispute resolution proceeding may be a court or court-related process, a tribunal, a mediation, an arbitration, or a similar proceeding. Actuarial evidence work may include the determination of capitalized values in respect of an individual, or the provision of an expert opinion with respect to a dispute involving an actuarial practice area, such as pensions or insurance, or questions of professional negligence. [*travail d'expertise devant les tribunaux*]

- .05 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, where appropriate, contingent events. [*méthode de la valeur présente actuarielle*]
- .06 Actuary, as it is used in these standards, means a member of a professional actuarial organization whose work in Canada is expected to conform to these standards. [*actuaire*]
- .07 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*]
- .08 Appointed actuary of an entity is an actuary formally appointed, pursuant to legislation, by the entity to monitor the financial condition of that entity. [*actuaire désigné*]
- .09 Appropriate engagement is one that does not impair the actuary's ability to conform to the precepts of ethical and professional conduct such as those that may be found in the Rules of Professional Conduct of the Canadian Institute of Actuaries or relevant law or regulation. Unless the context otherwise requires, wherever the word "engagement" is used in these standards it refers to an appropriate engagement. [*mandat approprié*]
- .10 Automatic balancing mechanisms automatically adjust contributions, benefits, and/or parameters of a plan in order to restore the balance between its source of financing and its benefits. The mechanism is prescribed by a set of predetermined measures to be taken, either immediately or later as prescribed, upon being triggered by certain demographic, economic, or financial indicators. [*mécanismes automatiques de compensation*]
- .11 Benefits liabilities are the liabilities of a plan in respect of claims incurred on or before a calculation date. [*obligations liées aux prestations*]
- .12 Best estimate means without bias. [*meilleure estimation*]
- .13 Calculation date is the effective date of a calculation; e.g., the calculation date in the case of a valuation for financial statements. It usually differs from the report date. [*date de calcul*]
- .14 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*]
- .15 Claim adjustment expenses are internal and external expenses in connection with settlement and administration of claims. [*frais de règlement des sinistres*]
- .16 Claim liabilities are the portion of insurance contract liabilities in respect of claims incurred on or before the calculation date. [*passif des sinistres*]

- .17 Contingent event is an event that may or may not happen, or that may happen in more than one way or that may happen at different times. [*éventualité*]
- .18 Contribution is a contribution by a participating employer or a plan member to fund a benefit plan. [*cotisation*]
- .19 Contribution principle is a principle of policyholder dividend determination whereby the amount deemed to be available for distribution to policyholders by the directors of a company is divided among policies in the same proportion as policies are considered to have contributed to that amount. [*principe de contribution*]
- .20 Credibility is a measure of the predictive value attached to an estimate based on a particular body of data. [*crédibilité*]
- .21 Credit spread, for a fixed-income asset, is the yield to maturity on that asset minus the yield to maturity on a risk-free fixed income asset with the same cash flow characteristics. [*écart de crédit*]
- .22 Definitive refers to a matter that is final and permanent rather than tentative, provisional, or unsettled. [*décision définitive*]
- .23 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*]
- .24 Explanatory text is text that appears outside of a box in these standards. [*texte explicatif*]
- .25 External user is a user other than the actuary's client or employer. Internal user and external user are mutually exclusive. [*utilisateur externe*]
- .26 External user report is a report whose users include an external user. [*rapport destiné à un utilisateur externe*]
- .27 Financial condition of an entity at a date refers to its prospective ability at that date to meet its future obligations, especially obligations to policy owners, members, and those to whom it owes benefits. Financial condition is sometimes called “future financial condition”. [*santé financière*]
- .28 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*]
- .29 To fund a plan is to dedicate assets to its future benefits and expenses. Similarly for “funded” and “funding”. [*provisionner*]

- .30 Funded status is the difference between the value of assets and the actuarial present value of benefits allocated to periods up to the calculation date by the actuarial cost method, based on a valuation of a pension plan, post-employment benefit plan, or social security program. [*niveau de provisionnement*]
- .31 Going concern valuation is a valuation that assumes that the entity to which the valuation applies continues indefinitely beyond the calculation date. [*évaluation en continuité*]
- .32 Indexed benefit is a benefit whose amount depends on the movement of an index such as the consumer price index. [*prestation indexée*]
- .33 Indicated rate is the best estimate of the premium required to provide for the corresponding expected claims costs, expenses, and provision for profit. [*taux indiqué*]
- .34 Insurance contract is a contract under which one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder. Insurance contract includes group insurance, third-party contracts where the owner of the contract and the person who is compensated (the policyholder) differ, and all like arrangements substantively in the nature of insurance. [*contrat d'assurance*]
- .35 Insurance contract liabilities in an insurer's statement of financial position are the liabilities at the date of the statement of financial position on account of the insurer's insurance contracts, including commitments, that are in force at that date or that were in force before that date. [*passif des contrats d'assurance*]
- .36 Insurer is the party that has an obligation under an insurance contract to compensate a policyholder if an insured event occurs. 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 post-employment benefit plan<sup>1</sup>. [*assureur*]
- .37 Internal user is the actuary's client or employer. Internal user and external user are mutually exclusive. [*utilisateur interne*]
- .38 Internal user report is a report all of whose users are internal users. [*rapport destiné à un utilisateur interne*]
- .39 Margin for adverse deviations is the difference between the assumption for a calculation and the corresponding best estimate assumption. [*marge pour écarts défavorables*]

<sup>1</sup> The wording of this definition is identical to the corresponding definition appearing in IFRS 4 appendix A, as of November 2009.



- .40 Model is a practical representation of relationships among entities or events using statistical, financial, economic, or mathematical concepts. A model uses methods, assumptions, and data that simplify a more complex system and produces results that are intended to provide useful information on that system. A model is composed of a model specification, a model implementation, and one or more model runs. Similarly for “to model”. [*modèle*]
- .41 Model implementation is one or more systems developed to perform the calculations for a model specification. For this purpose “systems” include computer programs, spreadsheets, and database programs. [*implémentation du modèle*]
- .42 Model risk is the risk that, due to flaws or limitations in the model or in its use, the actuary or a user of the results of the model will draw an inappropriate conclusion from those results. [*risque de modélisation*]
- .43 Model run is a set of inputs and the corresponding results produced by a model implementation. [*exécution d’un modèle*]
- .44 Model specification is the description of the components of a model and the interrelationship of those components with each other, including the types of data, assumptions, methods, entities, and events. [*spécifications du modèle*]
- .45 New standards means new standards, or amendment or rescission of existing standards. [*nouvelles normes*]
- .46 Periodic report is a report that is repeated at regular intervals. [*rapport périodique*]
- .47 Plan administrator is the person or entity with overall responsibility for the operation of a benefit plan. [*administrateur d’un régime*]
- .48 Policy liabilities in an insurer’s statement of financial position are the liabilities at the date of the statement of financial position on account of the insurer’s policies, including commitments, that are in force at that date or that were in force before that date. Policy liabilities consist of insurance contract liabilities and liabilities for policy contracts other than insurance contracts. [*passif des polices*]
- .49 Policyholder is a party that has a right to compensation under an insurance contract if an insured event occurs<sup>1</sup>. [*titulaire de police*]

---

<sup>1</sup> The wording of this definition is identical to the corresponding definition appearing in IFRS 4 appendix A, as of November 2009.

- .50 Premium liabilities are the portions of insurance contract liabilities that are not claim liabilities. [*passif des primes*]
- .51 Prescribed means prescribed by these standards. [*prescrit*]
- .52 Property and casualty insurance is insurance that insures individuals or legal persons
- Having an interest in tangible or intangible property, for costs arising from loss of or damage to such property (e.g., fire, fidelity, marine hull, warranty, credit, legal expense, and title insurance); or
  - For damages to others or costs arising from the actions of such persons (e.g., liability and surety bonds) and for costs arising from injury to such persons (e.g., automobile accident benefits insurance). [*assurances IARD*]
- .53 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*]
- .54 Public personal injury compensation plan means a public plan
- Whose primary purpose is to provide benefits and compensation for personal injuries;
  - Whose mandate may include health and safety objectives and other objectives ancillary to the provision of benefits and compensation for personal injuries; and
  - That has no other substantive commitments.
- The benefits and compensation provided under such public plans are defined by statute. In addition, such public plans have monopoly powers, require compulsory coverage except for those groups excepted by legislation or regulation, and have the authority to set assessment rates or premiums. [*régime public d'assurance pour préjudices corporels*]
- .55 Recommendation means text that appears in a box in these standards. Similarly for “recommend”. [*recommandation*]
- .56 Reinsurance recoverables in an insurer’s statement of financial position are the assets at the calculation date on account of reinsurance treaties, including commitments, that are in force at that date or that were in force before that date. [*sommes à recouvrer auprès des réassureurs*]
- .57 Related experience includes premiums, claims, exposures, expenses, and other relevant data for events analogous to the insured events under consideration other than the subject experience and may include established rate levels or rate differentials or external data. [*expérience connexe*]
- .58 Report is an actuary’s oral or written communication to users about his or her work. Similarly for “to report”. [*rapport*]

- .59 Report date is the date the actuary specifies as such in the report. It usually differs from the calculation date. [*date du rapport*]
- .60 Scenario is a set of consistent assumptions. [*scénario*]
- .61 Service cost is that portion of the present value of a plan's obligations that an actuarial cost method allocates to a time period, excluding any amount for that period in respect of unfunded accrued liabilities. [*cotisation d'exercice*]
- .62 Social security program means a program with all the following attributes regardless of how it is financed and administered:
- Coverage is of a broad segment, or all, of the population, often on a compulsory or automatic basis;
  - Benefits are provided to, or on behalf of, individuals;
  - The program, including benefits and financing method, is mandated by law;
  - The program is not financed through private insurance; and
  - Program benefits are principally provided or delivered in the form of periodic payments upon old age, retirement, death, disability, and/or survivorship.  
[*programme de sécurité sociale*]
- .63 Subject experience includes premiums, claims, exposures, expenses, and other data for the insurance categories under consideration. [*expérience visée*]
- .64 Subsequent event is an event of which an actuary first becomes aware after a calculation date but before the corresponding report date. [*événement subséquent*]
- .65 Trend is the tendency of data values to change in a general direction from one coverage period to a later coverage period. [*tendance*]
- .66 User means an intended user of the actuary's work. [*utilisateur*]
- .67 Virtually definitive refers to a matter that is almost certain, but that lacks one or more formalities like ratification, due diligence, regulatory approval, third reading, royal assent, or proclamation. However, a decision that still involves discretion at an executive or administrative level is not virtually definitive. [*pratiquement définitive*]

- .68 Work means work that is commonly, but not necessarily exclusively, performed by actuaries in assessing, measuring, and evaluating risks and contingencies and usually includes
- Acquisition of knowledge of the circumstances affecting the work that the actuary is undertaking;
  - 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*]

### **1130 Interpretation**

#### **Recommendations**

- .01 These standards consist of recommendations and explanatory text.
- .02 A recommendation is the highest order of guidance in these standards.
- .03 Each recommendation is in boxed text where it is accompanied by its effective date, shown in square brackets.

#### **Explanatory text**

- .04 The explanatory text supports and expands upon the recommendations. The explanatory text consists of definitions, explanations, examples, and useful practices.

#### **Effective date of recommendations**

- .05 The notice of adoption for new standards would indicate their effective date and whether early implementation is permitted and may provide additional direction regarding the application of new standards.
- .06 Subject to the notice of adoption, a recommendation applies to work with a calculation date that is on or after the recommendation's effective date. Superseded recommendations that were in effect at the calculation date would apply to work with a calculation date prior to the effective date of new standards unless early implementation is permitted and applied to the work.

#### **General standards and practice-specific standards**

- .07 These standards consist of general standards and practice-specific standards. With the exception noted below, the general standards apply to all areas of actuarial practice. In addition, the standards in part 4000 apply to all areas of actuarial practice if the actuary's work in an area meets the definition of actuarial evidence work.
- .08 Usually, the intent of the practice-specific standards is to narrow the range of practice considered acceptable under the general standards.

- .09 In exceptional cases, however, the intent of practice-specific standards is to define as acceptable a practice that 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 the explanatory text.

### **Drafting**

- .10 “Should” is the strongest mandating word in these standards, appearing only in recommendations, often in the expression, “The actuary should...”
- .11 “Would” is a suggestive word appearing in the explanatory text, often in the expression, “The actuary would...”, and is less forceful than the mandative “should”.
- .12 “May” is a permissive word, appearing in both recommendations and the explanatory text, often in the expression, “The actuary may...” and often with conditions attached. It defines a safe harbour. For example, in paragraph 1510.01, the recommendation is that “The actuary may use and take responsibility for another person’s work if such actions are justified.” and the explanatory text describes steps that 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.
- .13 The examples are often simplified and are not all-inclusive.

### **1140 Judgment**

- .01 The actuary should exercise reasonable judgment in applying these standards. A judgment is reasonable if it is objective and takes account of
- The spirit and intent of the standards;
  - Precepts of ethical and professional conduct intended to guide the conduct of the actuary;
  - Common sense; and
  - Constraints on time and resources. [Effective February 1, 2018]

### **Need for judgment**

- .02 While these 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 exercise of judgment is not clear-cut, except perhaps in hindsight. A judgment that is reasonable at its making is not made unreasonable by later hindsight.

- .04 A judgment that 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.
- .05 There is a reasonable range of assumptions that may be selected by an actuary for particular work and that might produce materially different results. Sometimes, it is desirable that actuaries produce results within a relatively narrow range, in which case the practice-specific standards may prescribe certain assumptions and/or methods to achieve that purpose.

**Spirit and intent**

- .06 In applying a specific standard, it is important to be guided by the spirit and intent behind it.

**Common sense**

- .07 A strained interpretation of a recommendation is inappropriate.
- .08 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.

**Constraint on time and resources**

- .09 The actuary would normally perform work in compliance with accepted actuarial practice. However in some circumstances within the scope of an appropriate engagement, the actuary's work may be constrained by available time and resources. In such circumstances, the actuary would adopt an interpretation and application that strikes a reasonable balance between compliance and modifications due to the constraints, after consideration of accepted actuarial practice with respect to materiality and the use of approximations. The actuary would report to the user any deviation from accepted actuarial practice.

**1150 Accepted actuarial practice**

- .01 Work in Canada 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 February 1, 2018]

- .02 These standards are the only explicit articulation of accepted actuarial practice for work in Canada. Explanation, examples, and other useful guidance may also be found in
- New standards, not yet effective but whose early implementation is appropriate;
  - Educational notes of the Canadian Institute of Actuaries;
  - Actuarial principles;
  - Exposure drafts;
  - Historical records;
  - Canadian and international actuarial literature; and
  - Practices that are generally accepted among actuaries and that are not in conflict with these standards.

The applicability and the relative importance of this other guidance for particular work is a matter for judgment.

- .03 Accepted actuarial practice is sometimes called “generally accepted actuarial practice” (for example, in the Insurance Companies Act (Canada)) or “generally accepted actuarial principles”.

### **1160 Scope**

- .01 These standards apply to work in Canada. [Effective February 1, 2018]
- .02 The application of any recommendations beyond their scope should take account of relevant circumstances. [Effective February 1, 2018]

### **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. Examples include
- 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.
  - If the work relates to taxation under the U.S. *Internal Revenue Code*, the work is work in the U.S. 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.
  - If the work relates to litigation under U.S. law before a U.S. court, the work is work in the U.S. 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.
- .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 accepted practice for actuarial work in that country. This encompasses the formal guidance that the actuarial profession in that country provides for work in that country. If that guidance does not exist or is limited, 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.



## 1200 Permitted Deviations

### 1210 Conflict with law

.01 If accepted actuarial practice conflicts with the law, the actuary should comply with the law, but should report the conflict and, if practical, useful, and appropriate under the terms of the engagement, report the result of applying accepted actuarial practice. [Effective February 1, 2018]

.02 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, a verbal description of the result is better than no report.

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

- Disclose that the work deviates from accepted actuarial practice;
- 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
- Promote eventual adoption of accepted actuarial practice into law.

In determining the usefulness of reporting, the actuary would take into account the needs of the various users.

.04 Accepted actuarial practice does not conflict with the law where the law mandates a practice, or limits practice to a range, that is within the range of accepted actuarial practice.

### 1220 Conflict with terms of engagement

.01 If accepted actuarial practice conflicts with the terms of an appropriate engagement, the actuary may comply with the terms of that engagement, but should report the conflict and, if practical, useful, and appropriate under the terms of that engagement, report the result of applying accepted actuarial practice. [Effective February 1, 2018]

- .02 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 benefit plan. Examples include situations where
- The actuary uses, but does not take responsibility for, the software system, or the work, of the staff of the client or employer; and
  - The client or employer or the terms of a benefits plan stipulates an assumption or a method that is not in accordance with accepted actuarial practice.
- .03 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 an engagement whose terms call for deviation from accepted actuarial practice, the actuary has discretion to accept or not to accept the engagement.
- .04 The practicality and usefulness of reporting a result in accordance with accepted actuarial practice are the same as for subsection 1210, Conflict with law.

### **1230 Unusual and unforeseen situations**

.01 Deviation from a particular recommendation or other guidance in these standards is accepted actuarial practice for an unusual or unforeseen situation for which the standards are inappropriate<sup>2</sup>. [Effective February 1, 2018]

.02 The actuary would report without reservation when deviating from a particular recommendation or other guidance in these standards in accordance with this subsection 1230, but it may sometimes be appropriate to describe and justify the deviation in the report.

### **1240 Materiality**

.01 Deviation from a particular recommendation or explanatory text in these standards is accepted actuarial practice if the effect of so doing is not material. [Effective February 1, 2018]

---

<sup>2</sup> Actuaries are encouraged to bring such situations to the attention of the Actuarial Standards Board, who may wish to consider how standards might be improved so that they do contemplate such situations.

.02 “Material” has its ordinary meaning, but is 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 to affect either the user’s decision-making or the user’s reasonable expectations. When the user does not specify a standard of materiality, judgment falls to the actuary. That judgment may be difficult for one or more of these reasons:

- 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.
- 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. The same is true for advice on a policy dividend scale.

- .03 The standard of materiality also depends on the work and the entity that 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 calculating an individual benefit (such as in a pension plan wind-up) than for a valuation of a group benefit plan (such as a going concern valuation of a pension plan); and
  - 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.
- .04 The actuary would not report an immaterial deviation from a particular recommendation or other guidance in these standards except if doing so assists a user to decide whether the standard of materiality is appropriate for that user.
- .05 The recommendation applies to both calculation and reporting standards.

#### **Calculation standards**

- .06 The result of applying a recommendation may not differ materially from the result of a simpler practice requiring less time and expense. For example, the practice-specific recommendations for valuation of insurance contract 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.
- .07 In considering materiality, it is not appropriate to net items that are reported separately. For example, if simple practices requiring less time and expense than those in the recommendations materially overstate the premium liabilities and materially understate its claim liabilities, but do not materially affect their sum, 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 insurance contract liabilities) is reported.

- .08 The effect of using a simpler practice requiring less time and expense than those in the recommendations may be conservative or not conservative. Usually, the criterion of materiality is the same in both cases.

**Reporting standards**

- .09 The result of applying a recommendation may provide information that 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 benefit plan's members is not useful if that class was trivial at the previous valuation. Also, description of immaterial provisions of a benefit plan is not useful. To ignore the recommendation is accepted actuarial practice in that situation.

## 1300 The Engagement

### 1310 Accepting and continuing an engagement

- .01 In accepting an engagement, the actuary should agree on its terms with the actuary's client or employer and be satisfied that it is an appropriate engagement. [Effective February 1, 2018]
- .02 In performing the engagement, if the actuary becomes aware of information that, if known beforehand, would have been an impediment to acceptance of the engagement, 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 February 1, 2018]
- .03 The actuary would consider consultation with the predecessor actuary, if any, to determine whether there is any reason not to accept the engagement.

#### 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 involved, 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 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 that 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.
  - 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.
- .06 An engagement may involve a duty of confidentiality that 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.
- .07 For example, the engagement may be appropriate if the actuary temporarily withholds knowledge of
- A mistake that 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.
- .08 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.
- .09 Any duty of confidentiality would give way to a duty of disclosure if disclosure is mandated by law, or if disclosure is required by a professional body to whom the actuary is subject.

- .10 Whether an engagement is appropriate depends on the actuary as well as on the engagement. For example, an actuary would not accept an engagement to perform work that the actuary is not qualified to do or where the actuary has an undisclosed conflict of interest.

**Subsequent information**

- .11 While performing the engagement, the actuary may become aware of information that, 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; or
  - Promised resources are not forthcoming and a substitute for them is not practical.
- .12 Renegotiation that 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.
- .13 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.

**1320 Financial interest of the actuary**

- .01 The financial interest of the actuary should not influence the result of the actuary's work. [Effective February 1, 2018]

**1330 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 assumptions or methods for the work. [Effective February 1, 2018]
- .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 in 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 benefit 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.
- .05 Note, however, that the recommendation does not preclude the actuary's use of assumptions or methods selected by the client or employer in an appropriate engagement, but the actuary would report such use.
- .06 Note also that the purpose of the work will influence the actuary's selection of assumptions and methods. 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.

### **1340 General knowledge**

- .01 The actuary should have adequate knowledge of the conditions in the practice area in which the actuary is working. [Effective February 1, 2018]
- .02 Where the actuary's work in a practice area meets the definition of actuarial evidence work, the actuary should have adequate knowledge of the conditions in both the practice area in which the actuary is working and the actuarial evidence practice area. [Effective February 1, 2018]
- .03 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.

### **1350 Knowledge of the circumstances affecting the work**

- .01 The actuary should take into account the circumstances affecting the work that the actuary is undertaking. [Effective February 1, 2018]
- .02 The circumstances affecting the work include the purpose of the work, the terms of the appropriate engagement under which the work is being performed, and the application of the law to the work.
- .03 The relevant knowledge for a corporate entity or benefit 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.

- .04 In the case of a benefit 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.
- .05 The relevant knowledge for calculation with respect to an individual is the demographics of the individual and the context of the calculation.
- .06 Additional conservatism in making a calculation is not a substitute for knowledge of the circumstances affecting the work.

## 1400 The Work

### 1410 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. [Effective February 1, 2018]
  - .02 If the actuary reports an appropriate approximation, the report should avoid unintended reservation. [Effective February 1, 2018]
  - .03 If the appropriateness of an approximation is doubtful, the actuary should report its use with reservation. [Effective February 1, 2018]
  - .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 these 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.
  - .07 The appropriateness of a simplification depends on the circumstances affecting the work 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 an appropriate 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; and
  - If the members of a pension plan who die before retirement are entitled to a benefit that 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, in some circumstances, the calculation of the liabilities in a benefit plan using an explicit wage and price inflation assumption may be approximated by calculating the liabilities without an explicit wage and price inflation assumption and using a lower liability discount rate assumption representative of the real rate of return.

### **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**

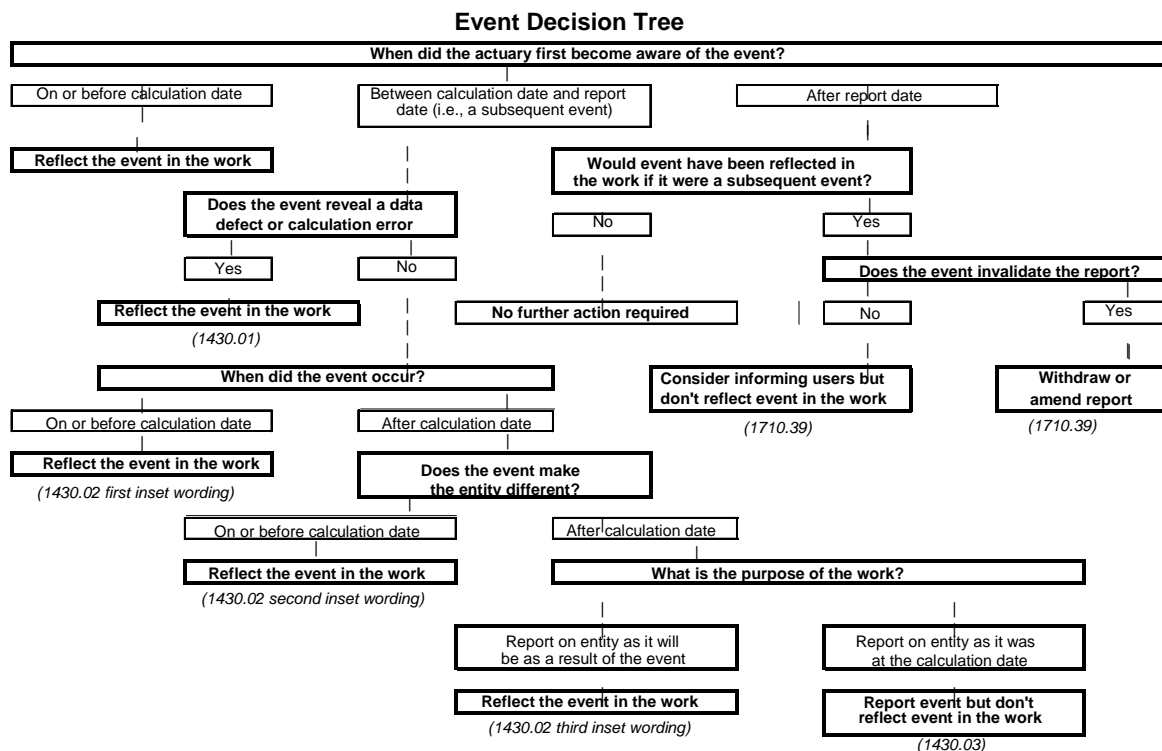
- .12 A criterion of the appropriateness of an approximation is its effect on the result. If the actuary approximates but is unable to assess the resulting error, the approximation becomes, in effect, an assumption. For example, data are missing and it is not practical to get them. The actuary would 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, he or she would also report the corresponding explicit assumption or assumptions. Similarly, if an actuary reports approximations for two offsetting assumptions that result 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, 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.

**1420 Event**

- .01 The following decision tree may assist an actuary in deciding how to reflect an event in the work, if the actuary determines that the event makes the entity different.



## 1430 Subsequent events

- .01 The actuary should correct any data defect or calculation error that is revealed by a subsequent event. [Effective February 1, 2018]
- .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
- Provides information about the entity as it was at the calculation date;
  - Retroactively makes the entity different at the calculation date; or
  - Makes the entity different 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. [Effective February 1, 2018]
- .03 The actuary should not take the subsequent event into account if it makes the entity different after the calculation date and a purpose of the work is to report on the entity as it was at the calculation date. Nevertheless, the actuary should report that subsequent event. [Effective February 1, 2018]

### Classification

- .04 A subsequent event is relevant to the recommendation if it reveals an error, provides information about the entity, or is a decision that makes the entity different.
- .05 The actuary would correct an error revealed by a subsequent event. The actuary would classify each subsequent event other than those that 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.

## Entity

.06 Examples of entities are

- The pension plan, in the case of an actuary doing a valuation of a pension plan;
- The block of annuity business, in the case of an actuary calculating the insurance contract liabilities for an insurance company's annuity business;
- A combination of the pension plan and the member's specific data, in the case of the determination of a member's individual entitlement under a pension plan; and
- The insurance company, in the case of an actuary valuing the insurance contract liabilities of an insurance company.

## Event provides information about entity as it was or retroactively makes entity different

.07 Examples of subsequent events that provide information about an entity as it was at the calculation date are

- Publication of an experience study that provides information for selection of assumptions;
- Reporting to an insurer of a claim that was incurred on or before the calculation date; and
- Adoption of a pension plan amendment prior to the calculation date of which the actuary becomes aware after the calculation date.

.08 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;
- Sell a portion of a participating employer's business and consequently to spin off the corresponding members from the participating employer's pension plan;
- Amend the benefits of a pension plan;
- Transfer a portion of an insurer's policies to another insurer; or
- Invoke a judicial decision that nullifies or significantly modifies the law affecting insurance claims.

.09 If an event provides information about the entity as it was at the calculation date or provides information that retroactively makes the entity different at the calculation date, the effect of the subsequent event on the work is the same as if the actuary first became aware of the information on or before the calculation date and the actuary would not report the event as a subsequent event. That is, the actuary would report the event only to the extent that the event would have been reported had the actuary first become aware of the information before the calculation date.

**Event makes entity different after**

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

.11 If the subsequent event makes the entity different 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, the actuary would take that event into account and would describe it in reporting.

.12 If the subsequent event makes the entity different after the calculation date and the purpose of the work is to report on the entity as it was at that date, 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

- .13 The classification of a subsequent event may be unclear, at least a priori, although the circumstances affecting the work and the actuary's engagement may make it clear. The following are examples of such events:
- 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 different only after the calculation date since it creates a new situation. The new situation would be reflected in the financial statements for the subsequent financial reporting period.
  - A salary freeze for employees who are members of a pension plan. If the salary freeze is a correction of excessive salaries, 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, it indicates a change in conditions that makes the entity different 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 circumstances, most of which had occurred before the calculation date but that was not apparent until revealed by the default, the default provides additional information about the entity as it was at the calculation date. If the default was precipitated by a catastrophe, it provides information about a change in conditions that makes the entity different 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 circumstances, most of which had occurred before the calculation date but that was not apparent until revealed by the insolvency, the insolvency provides information about the entity as it was at the calculation date. If the insolvency was precipitated by a catastrophe, it provides information about a change in conditions that makes the entity different after the calculation date.

## Reporting

- .14 Sometimes, either because the actuary considers it appropriate or the terms of the work require it, the actuary may report as an alternative the opposite calculation; i.e., one that does not take the subsequent event into account when the main calculation does, or that takes the subsequent 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, a subsequent event may be the early retirement of the plan member at some time between the calculation date and the report date. 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 such cases, the actuary would make the same calculations regardless of the purpose of the work but the reporting thereof would depend on the purpose of the work.

## 1440 Data

- |  |
|--|
| <p>.01 The <u>actuary</u> should apply such procedures as are necessary for the <u>actuary</u> to arrive at a conclusion as to the sufficiency and reliability of the data. [Effective February 1, 2018]</p> |
|--|
- .02 Data relevant to the work may include experience data, membership or policyholder data, census data, claims data, asset and investment data, economic data, operational data, benefit definitions, and policy or contract terms and conditions and other data relevant to the work.
- .03 Sources of data may include data obtained from inventory or sampling methods. Data may be obtained directly by the actuary or may be provided to the actuary by the client, by an accountant or auditor, by a government or statistical body, from a financial statement, or by others. Data may be specific to the client. Where data specific to the client are not available or not relevant, the actuary would consider using industry data, population data, or other published data with suitable adjustments where relevant and appropriate.

### Sufficiency and reliability

- .04 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.
- .05 Data are reliable if they are sufficiently complete, consistent, and accurate for the purposes of the work.

- .06 The actuary would test the sufficiency and reliability of (i.e., validate) the data as may be appropriate for the work but is not normally required to perform a detailed audit and is not responsible for discovering falsified or misleading data. If the terms of an appropriate engagement prevent the actuary from performing a validation of the data, the actuary would so report, and report any apparent or evident shortcomings in the data.
- .07 Validation of the data may include reconciliation against financial statements and books of account or other external data, examination of internal and external consistency, comparison with prior periods, availability of independent confirmation from other sources, or detailed confirmation using sampling techniques. .
- .08 If sufficient and reliable data cannot be obtained or the actuary is unable to ascertain the sufficiency or reliability of the data the actuary would, after first attempting to rectify the data, consider whether to report with reservation in respect of the data or to decline to perform the work.
- .09 Data may be rectified by obtaining corrected, more complete, alternative, additional, or supplementary data; by making assumptions with respect to incomplete data; or by making adjustments to the data.
- .10 If assumptions or adjustments applied to data by the actuary may cause material uncertainty or bias in the results of the work, the actuary would so report and would report any limitations on the use of the work product where appropriate.

#### **Reliance on others**

- .11 The actuary usually uses data prepared by another party such as the client, an independent administrator, an auditor, a government body, or an external association. When placing reliance on such data, the actuary would consider the qualifications, competence, integrity, and objectivity of the party providing the data.

#### **1450 Models**

- .01 When the work involves the use of a model, the actuary should
- choose a model appropriate to the purpose and requirements of the work; and
  - understand any limitations in the model that might make the results of the model inappropriate for the intended purpose or might produce a misleading result. [Effective January 1, 2018]
- .02 Like approximation, models pervade virtually all work and affect the application of most standards. The word “model” seldom appears in the standards, but is understood throughout them.

### Amount of effort required

- .03 The amount of effort in validation, documentation and risk mitigation would depend primarily on the influence that the model has on the decisions that it supports, and to a lesser extent on the complexity of the calculations and how they are performed. The actuary would determine how much effort is required for a particular model, taking into account the use of the work and the benefit that users would be expected to obtain from enhanced diligence.
- Some models are so simple or otherwise have such low model risk that the actuary is able to exercise appropriate diligence without formal documentation or reporting. Examples of such models are
    - models that are so simple that they could be performed effectively manually; and
    - models that are used solely to validate other models that are used in the actuary's work.
  - Some models are used repeatedly from the same model specification and the same model implementation but with different input data and/or assumptions. In that case, the diligence for choosing a model and for validating the model specification and model implementation is normally done only once. Documentation for each model run would normally be limited to noting the inputs and the version of the model used; and
  - Some models would require extra diligence because of greater financial significance, increased complexity, or greater uncertainty about the fit of the model to the more complex system it represents.

### Appropriate Model

- .04 A model is appropriate and is used appropriately if
- the model enables the actuary to better understand a complex reality, at a reasonable cost, while maintaining the aspects of that reality that are important to the work;
  - the model specification indicates that the intended purpose can be achieved by the model;
  - the model implementation has been verified as an accurate representation of the model specification;
  - each model run uses input data and assumptions consistent with the model specification; and
  - each model run is interpreted as set out in the model specification.

A standard actuarial method used within a model in its proper context would be considered appropriate without further justification; for example, actuarial present value method for a pension valuation and the chain ladder method and Bornhuetter-Ferguson method for unpaid claims liabilities.

## 1460 Control

- .01 Control procedures that detect errors and decrease the effect of errors should be performed for calculations. [Effective February 1, 2018]
- .02 To mitigate model risk, the actuary should perform model validation and employ other strategies appropriate for the financial significance of the results and the complexity of the model. [Effective January 1, 2018]
- .03 A calculation that is data-intensive, that is complex, that 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 that 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.
- .04 Examples of control procedures are procedures to ensure that
- All steps in the calculation are coordinated;
  - 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.
- .05 Examples of control tools are
- Random sampling;
  - Spot checks; and
  - Audit trails.

- .06 The actuary would test that the model implementation uses the data and assumptions as intended by the model specification. The actuary would also verify that the methods used by the model implementation function as intended by the model specification. The reasonableness of the model run may be tested by using alternative models. Various components of a complex model may be compared to results obtained by separate models.
- .07 The actuary would validate that the model specification is suitable for its intended purpose. For example, a stochastic model may be more suitable than a deterministic model for the valuation of minimum guarantees in some life insurance policies.
- .08 Strategies to mitigate model risk are also pertinent to models developed by third parties and those for which the actuary has limited access to intermediate results, but the range of strategies may be more limited than with other models.
- .09 In assessing a model's suitability, the actuary would understand the model's basic operations, important relationships, major sensitivities, limitations, strengths, and potential weaknesses.
- .10 When a model is to be used for stress tests or is stochastic, the actuary would give appropriate consideration to the statistical distributions used and the magnitude and behaviour of tail events in light of the nature of the work.

#### **1470 Reasonableness of result**

- .01 The actuary should examine the reasonableness of a calculation's result. [Effective February 1, 2018]
- .02 As a result of defective data, defective computer software, an accumulation of individually biased assumptions, or the like, a calculation, especially a complex one like a valuation or financial forecast, may be prone to error that checking of the calculation's steps does not reveal but that an examination of its result may reveal. Such an examination is therefore useful and prudent.
  - .03 The examination would consider simple questions like the following.
    - How does the result compare to the corresponding result for a prior period or a similar case, or to a related but independently calculated 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.

## 1480 Documentation

- .01 The actuary should use his or her best efforts to compile and secure the retention of appropriate documentation. [Effective February 1, 2018]
- .02 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 its conformity with accepted actuarial practice.
- .03 Both professional and legal needs may affect the length of time during which documentation is to be retained.
- .04 The actuary's documentation for a model, if required, would typically include
- the intended purpose of the model;
  - the appropriateness of the model specification for the intended purpose;
  - the limitations of the model specification relevant to the model's intended purpose;
  - the testing of the model implementation; and
  - the presence of appropriate mitigating strategies for model risk.
- .05 Model documentation would typically be sufficiently detailed to enable another actuary knowledgeable in the matters at hand to form an assessment of the judgments made and of the reasonableness of the model run.
- .06 When a model is based in whole or in part on a model developed by a third party, the actuary would document how the actuary assessed the model as being appropriate for the purpose.

## 1500 Another Person's Work

### 1510 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. If the actuary uses but does not take responsibility for another person's work, the actuary should so report. [Effective February 1, 2018]
- .02 Where the work involves the use of data provided by another person, subsection 1440 Data applies.
- .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.
- .04 If the actuary uses the work of a person other than colleagues and assistants, the actuary may or may not take responsibility for that person's work. Taking responsibility may require 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.
- .05 The actuary would not take such responsibility if doing so 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.
- .06 If the actuary does not take such responsibility, 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.

#### Use and take responsibility

- .07 The actuary may use and take responsibility for another person's work, given confidence that such actions are justified as a result of considerations such as the following:
- 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 that 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 The Canadian Institute of Actuaries encourages its members to use the work of an auditor in accordance with the Joint Policy Statement included in subsection 1520 of these standards of practice. The Joint Policy Statement also provides useful guidance if the actuary uses the work of a person other than an auditor.
- .09 Although an actuary may take responsibility for the work of another actuary in accordance with this section, the actuary who performed the work also continues to be responsible for that work.
- .10 In the case of use of another actuary's work, it may also be useful to
- Identify the differences between accepted actuarial practice in Canada and the practice that the other actuary followed if the other actuary worked outside of Canada; and
  - Review the other actuary's working papers.
- .11 The actuary need not report use of another person's work if the actuary takes responsibility for that work. To do so may imply a reservation.

**Use but not take responsibility**

- .12 If the actuary uses but does not take responsibility for another person's work, 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. For clarity, even though the other person may use a model in his or her work, the actuary is not considered to have used that model.

**1520 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 following Joint Policy Statement. [Effective February 1, 2018]

## Joint Policy Statement

concerning communications between auditors and actuaries  
involved in the preparation of financial statements

This Joint Policy Statement, effective October 1, 2007, has been approved by the Actuarial Standards Board (Canada) and by the Auditing and Assurance Standards Board (Canada).

### 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 Canadian Auditing Standards in the CICA Handbook-Assurance and the relevant independence and other ethical requirements set out in the rules of professional conduct/code of ethics applicable to the practice of public accounting issued by various professional accounting bodies.
  - 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 professional accounting body. 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.

### 1530 Review or repeat of another actuary's work

- .01 In this subsection 1530,
- “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 1530 apply to a review engagement that 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. [Effective February 1, 2018]
- .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. [Effective February 1, 2018]
- .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. [Effective February 1, 2018]
- .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. [Effective February 1, 2018]
- .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. [[Effective February 1, 2018]
- .08 If the first actuary's work is not within the range of accepted actuarial practice, then the reviewer should so report. [Effective February 1, 2018]



.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 February 1, 2018]

### **Selection of reviewer**

- .10 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 1530;
  - helping to assure selection of a qualified reviewer; and
  - avoiding unnecessary duplication by the reviewer of the first actuary's work.
- .11 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.
- .12 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.
- .13 The perceived objectivity of the reviewer is enhanced if the reviewer is independent of the first actuary.

### **Terms of the engagement**

- .14 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.
- .15 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**

- .16 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.
- .17 If the reviewer has access to different data, information, or resources, or has different time constraints, then the reviewer would so report.
- .18 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.
- .19 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 that result from early discussion on matters which the first actuary had not yet decided.
- .20 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.

### **Review engagement which precludes discussion between the two actuaries**

- .21 The reviewer would consider the appropriateness of a review engagement that 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, for example, where
  - 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.

- .22 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 that are within the range of accepted actuarial practice.
- .23 An engagement that 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**

- .24 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.

## 1600 Assumptions and Methods

### 1610 Methods

- .01 The actuary should select a method that takes account of the circumstances affecting the work. [Effective February 1, 2018]
- .02 The basis for calculating actuarial estimates is comprised of a method and one or more assumptions. Methods represent the underlying manner in which actuarial calculations are undertaken. Methods differ from one area of actuarial practice to another and have differed over time.
- .03 In selecting an appropriate method, the actuary would consider whether any method is mandated by law, by practice-specific standards or by the terms of the engagement.

### 1620 Assumptions

- .01 The actuary should identify and select each assumption that is needed for the work, except for those that are prescribed, that are mandated by law or that are stipulated by the terms of the engagement. [Effective February 1, 2018]
- .02 The actuary should select an appropriate model or data assumption for a matter as the best estimate assumption relating to that matter, modified, if appropriate, to make provision for adverse deviations. In selecting an assumption, the actuary should take account of the circumstances affecting the work, past experience data, the relationship of past to expected future experience, anti-selection, and the relationship among matters. [Effective February 1, 2018]
- .03 The appropriate assumption for a matter, other than a model or data assumption, should be continuation of the status quo, unless there is none or unless there is a reasonable expectation that it will change, and the actuary so reports. [Effective February 1, 2018]
- .04 Throughout the standards, the word “calculation” appears, but not as a defined term. It can imply a mathematical operation as simple as adding two numbers or as complex as a scenario of dynamic capital adequacy testing. “Calculation” does not necessarily imply that a model is used. The word “calculation”, when used in the context of a model, emphasizes the result of a model run and to a lesser extent model specification and model implementation.
- .05 It may be useful, under the terms of the engagement, 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.

### **Model assumptions**

- .06 The model assumptions are quantitative assumptions in a model 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.
- .07 There is a model assumption for each of the matters that the actuary's model takes into account. Those matters would be sufficiently comprehensive for the model reasonably to represent reality.
- .08 A model, whether simple or complex, requires model assumptions. The model depends on the purpose of the work and the sensitivity of the model run 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 specification does not take into account a matter, the result is an implicit assumption about that matter, usually an assumption of zero probability or of zero rate. The actuary may compensate for an inappropriate implicit assumption regarding a matter that the model specification does not take into account by altering the explicit assumption regarding a matter that the model does take into account.
- .09 For models with interrelated model assumptions, the actuary would consider the interaction between assumptions.

### **Data assumptions**

- .10 Data assumptions are the assumptions, if any, needed to relieve insufficiency or unreliability in the data.
- .11 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.

### **Assumptions other than model and data assumptions**

- .12 The assumptions other than model and data assumptions are the assumptions about the legal, economic, demographic, and social environment upon which the model and data assumptions depend.

- .13 Such other assumptions are usually qualitative, dealing with the environment; for example,
- Legislation, like the Income Tax Act (Canada);
  - Student education;
  - The medical care system;
  - Government social security systems; and
  - International treaties.
- .14 Those assumptions are needed to the extent that the model assumptions and, in some cases, the data assumptions depend upon them. Such assumptions are numerous and it is not practical to identify all of them.
- .15 Continuation of the status quo is usually the appropriate assumption for other than model and data assumptions; for example, an assumption that the fund of a registered pension plan continues not to be taxed 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
- That is different from continuation of the status quo; and
  - Regarding a matter for which there is no status quo, for example, a student's assumed occupation after completion of education.

#### **Acceptable range**

- .16 There is a reasonable range of assumptions that may be selected by an actuary for particular work and that might produce materially different results. Sometimes, it is desirable that actuaries produce results within a relatively narrow range, in which case the practice-specific standards may prescribe certain methods and/or assumptions to achieve that purpose.

#### **Circumstances affecting the work**

- .17 Knowledge of the circumstances affecting the work may require consultation with the persons responsible for the functions that affect experience. For example, if the calculation is to value the assets or liabilities of a benefits plan, the actuary would consult the persons responsible for investments, administration, and plan provisions. If the calculation is to value the policy liabilities of an insurer, the actuary would consult the officers responsible for investments, underwriting, claims, marketing, product design, policy dividends, and policy servicing.
- .18 An assumption about a matter would take account of the circumstances affecting the work if those circumstances affect that matter. The circumstances affecting the work are relevant for experience in most matters other than economic matters.

### **Past experience data**

- .19 The available and pertinent past experience data are helpful in the selection of assumptions.
- .20 Other things being the same, pertinent past experience data are data
- Relating to the case itself rather than to similar cases;
  - Relating to the recent past rather than to the distant past;
  - That are homogeneous rather than heterogeneous; and
  - That are statistically credible.

These criteria may conflict with each other.

### **Expected future experience vs. past experience**

- .21 To extrapolate pertinent past experience and its trend to the near future is often, but not necessarily, appropriate.
- .22 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.
- .23 An extrapolation would take account of a change that 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**

- .24 Each assumption would normally take account of potential anti-selection.
- .25 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, for example, an insurer's policy owner, a benefits plan's member, a borrower, a lender, or a shareholder.

- .26 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;
  - Policy owner 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
  - Shareholder to retract a share.
- .27 When considering a single relationship, it is reasonable to expect that party 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. However, where a number of such relationships are concerned, such as a portfolio of policy owners or members of a benefit plan, it may not be reasonable to assume that every one of these would exercise such an option in that manner.
- .28 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 policy owner 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 policy owner (who is also the life insured) in ill health may be unable to afford to continue an insurance policy with a low premium);
  - The policy owner's or plan member's difficulty in making the required judgment (for example, everyone knows his or her age, but a person may be unable to gauge the effect of ill health on longevity); and
  - The sophistication of the policy owner, plan member, borrower, lender, or shareholder.

**Independently reasonable and appropriate in the aggregate**

- .29 The assumptions that the actuary selects or for which the actuary takes responsibility, other than alternative assumptions selected for the purpose of sensitivity testing, would be independently reasonable and appropriate in the aggregate.



- .30 The actuary would select independently reasonable assumptions. The following are examples:
- For a typical defined benefit pension plan valuation, the actuary would adopt an explicit investment assumption, as well as an explicit expense assumption rather than using implicit assumptions incorporated within a net discount rate. However, for a small defined benefit pension plan, the actuary may choose to use approximations for the investment expenses.
  - For a typical non-participating life insurance portfolio where experience is not passed on to policy owners, all assumptions would be established independently. However, for a typical participating life insurance portfolio where experience is passed on to policy owners through changes to the dividend scale, a reasonable representation of reality would be to assume that the current dividend scale and current experience persist into the future, as long as any implicit offsets in assumptions simplify the valuation and do not materially affect the amount of the valuation.
- .31 The actuary would avoid the use of independently reasonable assumptions that are inconsistent or biased in the same direction, either of which might result in the assumptions not being reasonable in the aggregate. If an assumption is prescribed, is mandated by law or is stipulated by the terms of the engagement, it would not be appropriate to compensate for this prescription or stipulation by modifying other assumptions. The remaining assumptions would be reasonable in the aggregate and to the extent possible be independently reasonable.
- .32 The use of independently reasonable assumptions implies that each assumption is explicitly defined. However, there would be no requirement to use explicit assumptions in the model specification, as long as the result of using that model does not produce a material error. For example, for pension valuations, use of a discount rate net of expenses may produce a value very close to the value obtained by using explicit assumptions. In this case, the actuary would disclose both the gross investment rate assumption and the expense assumption.

**Stipulated or mandated assumptions**

- .33 Use of an assumption stipulated by the terms of the engagement is use of the work of another person.
- .34 If the assumption is mandated by law and an amendment to the law is virtually definitive, it may be useful to report a result that reflects the amendment.

### Discount rate

- .35 The use of a discount rate is inherent in the actuarial present value method. The discount rate may be constant or it may vary over time. In selecting the best estimate assumption for the discount rate, the actuary, consistent with the circumstances affecting the work, may either
- Take into account the expected investment returns of the assets that support the liabilities; or
  - Reflect interest rates on relevant fixed income reference securities.
- .36 In selecting the best estimate assumption for the discount rate, the actuary, consistent with the circumstances affecting the work, may assume that the yields on fixed income investments at future dates, either
- Remain at levels applicable at the calculation date; or
  - Revert in the long term to expected levels.

### 1630 Provision for adverse deviations

- .01 The actuary should include a provision for adverse deviations in calculations only to the extent required by the terms of the actuary's engagement or as mandated by law or as prescribed by practice-specific standards. [Effective February 1, 2018]

### 1640 Comparison of current and prior assumptions

- .01 Unless the actuary reports the inconsistency, the assumptions for a calculation for a periodic report should be consistent with those of the prior calculation. [Effective February 1, 2018]
- .02 The definition of consistency for the purpose of this recommendation varies among practice areas. For example,
- 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 numerically the same; and
  - For valuation of an insurer's insurance contract 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.
- .03 If the assumptions are not so consistent, the actuary would report the inconsistency. If practical, useful and appropriate under the terms of the engagement, the report would quantify the effect of the inconsistency.

## 1700 Reporting

### 1710 Reporting: external user report

.01 In an external user report, the actuary should

- Identify the client or employer;
- Describe the work, its purpose, and its users;
- Say that use of the report may not be suitable for another purpose;
- Say whether or not the work is in accordance with accepted actuarial practice in Canada and, if not, disclose the deviation from that practice;
- If useful, disclose any unusual application of accepted actuarial practice;
- If the report is supported by the use of a model, disclose limitations in the model relevant to the intended purpose;
- Disclose any aspect of the work for which the actuary does not take responsibility;
- Describe each assumption used for the work that is material to the results of the work, including the extent of any margin for adverse deviations included with respect to each such assumption;
- Provide the rationale for each such assumption that is material to the results of the work;
- For matters requiring an assumption other than a model or data assumption, disclose any assumption that is different from assumption of continuance of the status quo and, if practical, useful, and appropriate under the terms of the engagement, disclose the effect of alternative assumptions;
- Describe the methods used for the work;
- In the case of a periodic report, disclose any inconsistency between the assumptions and methods of the current and prior reports and the rationale for such inconsistency;
- Describe any subsequent event that is not taken into account in the work;
- Disclose any reservation;
- Express an opinion on the assumptions and methods used for the work;
- Express an opinion on the results of the work;
- Identify himself or herself and sign the report; and
- Date the report. [Effective February 1, 2018]

- .02 Any description or disclosure may be in material referred to in the report and either accompany the report or plausibly be available to users. [Effective February 1, 2018]
- .03 Subsequently, the actuary should respond to a user's request for explanation except if that is contrary to the terms of the engagement. [Effective February 1, 2018]
- .04 Subsequently, the actuary should withdraw or amend the report if information comes to hand after the report date that invalidates the report. [Effective February 1, 2018]
- .05 A duty of confidentiality in an appropriate engagement supersedes any of the foregoing portions of this recommendation with which it conflicts. [Effective February 1, 2018]

### **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 would be 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 are not the same.
- .07 Appropriate description and disclosure in a report strike a balance between too little and too much. Too little disclosure deprives the user of needed information. Too much disclosure 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 affecting the work may make the actuary aware of information needs of which the user is unaware.
- .09 The actuary would consider and address the sensitivity of the results of the work to variations in key assumptions where practical, useful, and consistent with the terms of the engagement.
- .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. The following are examples.
- 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, 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 mandated by law, 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. Where a report has more than one user, the actuary would have regard to the information of value to each user in determining appropriate disclosure.

**Accepted actuarial practice**

- .16 If the work is in accordance with accepted actuarial practice, a simple statement to that effect is a powerful statement, and reassuring even to a user with a limited understanding of what constitutes accepted actuarial practice. If the work is not in accordance with accepted actuarial practice, 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.
- .18 For work in Canada, the actuary would refer to "accepted actuarial practice for work in Canada", or use other language of equivalent meaning and clarity.

- .19 For work outside of Canada, the actuary may choose to refer to
- “Accepted actuarial practice for work in [country]”, if the guidance of a foreign jurisdiction has been applied to the work;
  - “Internationally accepted actuarial practice”, if the guidance of the International Actuarial Association has been applied to the work; or
  - “Accepted actuarial practice for work in Canada”, if Canadian guidance has been applied to the work because of the absence of applicable foreign guidance.

**Unusual application of accepted actuarial practice**

- .20 The actuary would not usually report a deviation from a particular recommendation or other guidance in these standards as a result of an unusual or unforeseen situation.
- .21 If, as is common, accepted actuarial practice for an aspect of the work encompasses a range, the actuary usually reports the work as being 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
- Mandated by law or specified by the terms of the actuary’s engagement;
  - Excluded from the accepted range by an exposure draft or by approved, but not yet effective, new standards;
  - Inconsistent with the corresponding assumption of a prior periodic report;
  - Dependent on a special permissive feature in the law for its acceptability; or
  - Unusual or controversial.

**Limitation to actuary’s responsibility**

- .22 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.

**Disclosure of assumptions**

- .23 Where an assumption or method is mandated by law, the actuary would, if relevant, disclose that use of the report, based on the mandated assumption or method, may not be appropriate for purposes other than that for which the report was prepared.

### Subsequent event not taken into account in the work

- .24 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. If useful, the actuary would 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

- .25 A report with reservation may be unavoidable in certain circumstances, such as the following:
- The actuary was obliged to use the work of another person and has doubts about the appropriateness of so doing.
  - The actuary was unable to arrive at a conclusion as to the sufficiency and reliability of the data.
  - 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.
  - There is an unresolved conflict of interest.
- .26 The actuary would report any remedy, underway or expected, to the problem causing the reservation.
- .27 A serious reservation may call for consulting with another actuary or obtaining legal advice.
- .28 Barring explicit disclosure to the contrary in the report, the user is entitled to assume that
- The work is in accordance with accepted actuarial practice and no reservation is required;
  - The data are sufficient and reliable; and
  - If a periodic report, the method is the same as that in the prior report and the assumptions are consistent with those in the prior report.



### Use of models

- .29 An external user report would rarely refer directly to a model. Disclosures related to a model are typically found in supporting documents. The report would contain a reference to a model if, for example, the actuary is required to do so by the engagement, the model has limitations relevant to the purpose of the engagement, or the actuary is unable to assess model risk.
- .30 Explanation of the limitations of a model and the implications of those limitations would include descriptions of
- any relevant exclusions from the model, and
  - simplifying assumptions made.
- .31 If the actuary uses a model outside the domain of actuarial practice and is not able to verify the appropriateness of using such a model, the actuary would so report.

### Opinion

- .32 In giving an opinion on any matter in the report, the actuary would begin with “In my opinion...” which is a signal that the actuary is giving a formal, professional opinion.
- .33 With respect to any assumption or method specified by the terms of the engagement, the actuary would
- If the actuary considers such assumption or method to fall within the range of accepted actuarial practice, opine that the assumption or method is appropriate;
  - If the actuary considers such assumption or method to not fall within the range of accepted actuarial practice, report that the assumption or method is not in accordance with accepted actuarial practice and report that the assumption or method was specified by the terms of the engagement, as applicable;
  - If the actuary is unable to easily determine whether the assumption or method falls within the range of accepted actuarial practice, report that the assumption or method may not be in accordance with accepted actuarial practice and report that the assumption or method was specified by the terms of the engagement, as applicable.
- .34 It may be convenient to group the opinion statements in the external user report in a section with a heading such as Statement of Opinion that would be signed by the actuary.

### Identification

- .35 For work in Canada, 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.

### Report date

- .36 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.
- .37 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.
- .38 The date the actuary signs and delivers the report would be as soon thereafter as practical. If there is an unavoidably long delay, however, the actuary would consider any additional subsequent events that would result from a current report date.
- .39 The actuary would issue the report within a reasonable time period with regard to the actuary's terms of engagement and the needs of the users of the report.

### Withdrawal or amendment of a report

- .40 After the report date, the actuary has no obligation to seek additional information that, if known at the report date, would have been reflected in the work, but, if additional information comes to hand, the actuary would consider if it affects the report. Additional information affects the report if it
- Reveals a data defect or a calculation error;
  - Provides additional information about the entity that is the subject of the report as that entity was at the calculation date;
  - Retroactively makes that entity different at the calculation date; or
  - Makes that entity different 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.
- .41 Additional information may consist 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 results in the actuary determining that an event has occurred that would have to be taken into account in the data, assumptions, or methods for the work, it would affect the report. It does not affect the report if it makes the entity, which is the subject of the report, different 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 that would lead the actuary to select different assumptions at the next calculation date for a periodic report.

- .42 If the additional information results in the actuary determining that an event has occurred that affects the report, the actuary would determine whether the event invalidates the report. If the actuary determines that the event does not invalidate the report, the actuary would consider whether to inform some or all of the users of the report about the event. If the actuary determines that the event invalidates the report, the actuary would withdraw or amend the report. If the actuary withdraws or amends a report, 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.
- .43 The following examples are intended to assist actuaries in determining whether an event of which the actuary becomes aware after the report date may be worthy of disclosure to the users of the report or may require the report to be withdrawn or amended:
- If an event affects a report, but that report has been superseded by another report, typically no action would be taken with respect to the prior report;
  - If an event materially affects the financial position, financial condition, or funded status of a pension plan, but does not materially affect the funding of the plan, it may be sufficient to disclose the event to the users of the report rather than withdraw or amend the report;
  - If an event results in a situation where an assumption used in the work is obviously erroneous, but the assumption was reasonable at the report date, the actuary would typically not withdraw or amend the report, but would reflect the event in a subsequent report; and
  - If an actuary has prepared a report that provides advice on the funding of a pension plan and, subsequent to the report date discovers an error in the report, and the funding recommendations contained in the report would change materially if the error were corrected, the actuary may determine that it is appropriate to withdraw or amend the report.

### **1720 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 February 1, 2018]

- .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 a representative of the actuary's employer or client 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.

### **1730 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.

### **1740 Summary report**

- .01 Where required by practice-specific standards, the actuary should prepare a summary report.  
[Effective February 1, 2018]

- .02 The practice-specific standards specify the language to be used in the summary report.
- .03 The purpose of the summary report is to simplify the actuary's communication with users and may be incorporated in a report prepared by the actuary's employer or client; for example, the financial statements of an insurer, a pension plan or a public personal injury compensation plan. Such a report does not constitute an external user report.

## 2000—Insurance

## Table of Contents

<b>2000—Insurance .....</b>	<b>2001</b>
<b>2100 Insurance Contract Valuation: All Insurance .....</b>	<b>2004</b>
2110 Scope.....	2004
2120 Method .....	2005
2130 Reporting.....	2012
<b>2200 Insurance Contract Valuation: Property and Casualty Insurance ...</b>	<b>2020</b>
2210 Scope.....	2020
2220 Claim liabilities .....	2020
2230 Premium liabilities .....	2021
2240 Present values.....	2022
2250 Margin for adverse deviations – general.....	2023
2260 Margin for adverse deviations – deterministic analysis .....	2025
2270 Margin for adverse deviations – stochastic analysis .....	2025
<b>2300 Insurance Contract Valuation: Life and Health (Accident and Sickness)</b>	
<b>Insurance .....</b>	<b>2027</b>
2310 Scope.....	2027
2320 Method .....	2027
2330 Scenario assumptions: Interest rates .....	2037
2340 Other assumptions: Economic.....	2045
2350 Other assumptions: non-economic .....	2050
2360 Valuation of segregated fund insurance contract liabilities.....	2060
2370 Stochastic scenarios.....	2064
<b>2400 The Appointed Actuary.....</b>	<b>2067</b>
2410 Definitions.....	2067
2420 Scope.....	2067
2430 Accepting and continuing an engagement.....	2067
2440 Report on matters requiring rectification .....	2069
2450 Report to the directors .....	2070
2460 Communication with the auditor .....	2074
2470 Certification of capital filings as required by the regulator.....	2074
<b>2500 Dynamic Capital Adequacy Testing .....</b>	<b>2077</b>
2510 Scope.....	2077
2520 Analysis .....	2077
2530 Reporting.....	2083
2540 Opinion by the actuary .....	2084

<b>2600</b>	<b>Rate-making: Property and Casualty Insurance.....</b>	<b>2085</b>
2610	Scope.....	2085
2620	Method .....	2086
2630	Reporting.....	2089
<b>2700</b>	<b>Policyholder Dividend Determination.....</b>	<b>2090</b>
2710	Scope.....	2090
2720	Report on policyholder dividends.....	2090

## 2100 Insurance Contract Valuation: All Insurance

### 2110 Scope

- .01 Part 1000 applies to work within the scope of part 2000.
- .02 Section 2100 applies to all kinds of insurance.
- .03 Section 2200 applies to property and casualty insurance.
- .04 Section 2300 applies to life and health (accident and sickness) insurance.
- .05 Sections 2400 and 2500 apply to all kinds of insurance.
- .06 Section 2600 applies to property and casualty insurance.
- .07 Section 2700 applies to life and health (accident and sickness) insurance.
- .08 Part 2000 does not apply to post-employment benefit plans covered by the Practice-Specific Standards for Post-Employment Benefit Plans, nor does it apply to personal injury compensation plans covered by the Practice-Specific Standards for Public Personal Injury Compensation Plans.
- .09 The legal form of the insurer is not relevant for purposes of the application of part 2000.
- .10 Sections 2100, 2200, and 2300 apply to the valuation of the insurance contract liabilities and reinsurance recoverables in an insurer's financial statements when the intent is that those statements be in accordance with generally accepted accounting principles in Canada, whether or not the insurer is a publicly accountable enterprise<sup>1</sup>. They also apply where statutory or regulatory instructions require the actuary to value the insurer's policy liabilities in accordance with accepted actuarial practice.
- .11 In certain cases, methodology described in one of sections 2200 or 2300 may be useful for the insurance to which the other section applies. For example, while a simple technique is usually appropriate for valuation of claim liabilities for life and health insurance, the more sophisticated techniques used for property and casualty insurance may be appropriate for life and health insurance contracts for which claim development is complex. Similarly, for travel insurance and other short-term policies sold by property and casualty insurers, a simple technique may be appropriate.

---

<sup>1</sup> The *CPA Canada Handbook* contains both Canadian generally accepted accounting principles applicable to publicly accountable enterprises (i.e., International Financial Reporting Standards) and Canadian generally accepted accounting principles applicable to private enterprises and not-for-profit organizations.



## 2120 Method

- .01 The actuary should value the insurance contract liabilities and the reinsurance recoverables for the statement of financial position and the changes in them for the statement of income. [Effective April 15, 2017]
- .02 The actuary should coordinate the valuation with the insurer's accounting policy as respects the choice between going concern and wind-up accounting, and so that the insurance contract liabilities, reinsurance recoverables, and other items in the statement of financial position
- Are consistent;
  - Avoid omission and double counting; and
  - Conform to the presentation of the statement of income. [Effective April 15, 2017]
- .03 The relevant insurance contracts for the valuation are those that are in force, including those whose issue is then committed, at the calculation date, or that were in force earlier and that will generate cash flow after the calculation date. [Effective April 15, 2017]
- .04 The insurance contract liabilities, net of reinsurance recoverables, in respect of each of the relevant insurance contracts should be comprised of the cash flow after the calculation date from the premiums, benefits, claims, expenses, and taxes that are incurred during the term of its liabilities. [Effective April 15, 2017]
- .05 The cash flows that comprise the insurance contract liabilities should include the effect of
- Retrospective premium, commission, and similar adjustments;
  - Experience rating refunds;
  - Reinsurance ceded;
  - Subrogation and salvage;
  - The exercise of policy owner options; and
  - The deemed termination at the end of the term of its liabilities of each policy then in force. [Effective April 15, 2017]
- .06 The valuation should take account of the time value of money. [Effective April 15, 2017]

.07 The actuary should ensure that the application of margins for adverse deviations with respect to the insurance contract liabilities and the related reinsurance recoverables 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 April 15, 2017]

.08 Policy liabilities other than insurance contract liabilities would be valued in conformity with applicable International Financial Reporting Standards and accepted actuarial practice.

**Calculation date**

.09 Consistent with its definition in part 1000, the term "calculation date" as used throughout part 2000 refers to the effective date of the valuation of assets and liabilities reported in the financial statements (commonly referred to in practice as the "balance sheet date").

**The insurer's accounting policy**

.10 In preparing the insurer's financial statements, management would choose 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.

.11 Going concern accounting is appropriate for an insurer that is expected to remain open to new business and in satisfactory financial position indefinitely.

.12 Going concern accounting is also appropriate for an insurer that is expected to become closed to new business, but to continue in a satisfactory financial position, either indefinitely or until

- An increase in capital; or
- A combination with, or transfer of its policies to, another insurer in a satisfactory financial condition,

brings financial relief.

.13 Use of the terms "insurance contract liabilities", "policy liabilities", "reinsurance recoverables", "premium liabilities", and "claim liabilities" is desirable in financial statements, but the choice of the terminology and itemization is a management decision. Regardless of the terminology and itemization chosen, the actuary would ensure that all relevant liabilities are identified and valued.

- .14 Insurance contract liabilities and reinsurance recoverables consist of premium liabilities and claim liabilities. Claim liabilities are those in respect of benefits and claims incurred on or before the calculation date. The valuation of claims liabilities would reflect all cash flow related to such claims, including benefit payments, expenses and taxes, occurring after the calculation date. Premium liabilities are those in respect of premiums and all other benefits and claims, including their related expenses and taxes, incurred after the calculation date.
- .15 When reporting under International Financial Reporting Standards, insurance contract liabilities reported in the insurer's statement of financial position would be presented gross of reinsurance recoverables. The value of the reinsurance recoverables is recorded separately and would be valued appropriately. The valuation of the reinsurance recoverables would take account of not only the reinsurer's share of claims but also reinsurance commissions, allowances, retrospective premium adjustments, and the financial condition of the reinsurer. Where an actuary is valuing, and reporting on, the valuation of policy liabilities other than in compliance with International Financial Reporting Standards, the policy liabilities may be reported net of reinsurance recoverables.
- .16 For the purposes of part 2000, the insurance contract liabilities reported in the insurer's statement of financial position would exclude the liabilities of its segregated funds, but would include, in respect of segregated fund contracts, the liabilities of its general fund related to insurance benefits payable under the terms of such contracts, such as guaranteed minimum benefits in excess of policy owner account values.

.17 The insurer's accounting policy may report amounts related to insurance contracts and the assets that support insurance contract liabilities, as part of the insurance contract liabilities, or as separate items in the statement of financial position, or as a mixture of the two. Examples of such related items include

- Deposit liabilities (for example, policy dividends on deposit);
- Incurred but unpaid items (for example, taxes incurred but not paid and policy dividends due but not paid);
- Future tax liabilities and assets (for example, those in connection with the timing differences between accounting and tax liabilities);
- Receivables from, payables to, and deposits by reinsurers;
- Amounts recoverable from policy owners;
- Provisions for asset depreciation; and
- Deferred policy acquisition expenses.

The actuary would value the insurance contract liabilities so that

- In the aggregate, the insurance contract 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.

.18 As respects consistency, the actuary would, for example, ensure that the cash flows included in the insurance contract liabilities and the reinsurance cash flows in respect of the same policies are estimated based on consistent assumptions, except that reinsurance cash flows would also take account of the financial condition of the reinsurer.

.19 As respects double counting and omission, the actuary would, for example, ensure that

- No asset is allocated more than once to support liabilities; and
- The provision for asset depreciation included in the insurance contract liabilities does not duplicate any provision for asset depreciation deducted from the asset side of the statement of financial position.

#### **Relevant insurance contracts**

.20 At the calculation date, the relevant contracts for the valuation include

- Policies that are in force at that date;
- policies which, at that date, the insurer is committed to issue; and
- Policies that were in force prior to that date which could generate cash flow after that date.

There are no amounts included in insurance contract liabilities in the financial statements in respect of other policies expected to be issued after the calculation date, whether or not they are expected to be profitable.

- .21 There usually are both premium liabilities and claim liabilities in respect of policies that are in force at the calculation date. There may be reinsurance recoverables in respect of insurance contracts that are in force at the calculation date.
- .22 There may be claim liabilities in respect of policies that are not in force at the calculation 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 policy owners to reinstate them, or of their unpaid
- Retrospective premium, commission, and similar adjustments;
  - Experience rating refunds; and
  - Subrogation and salvage.

There may be reinsurance recoverables related to policies that are not in force at the calculation date as a result of outstanding claims incurred while they were in force.

#### **Cash flows comprising the insurance contract liabilities**

- .23 The insurance contract liabilities in respect of a relevant policy are comprised of that policy's cash flows after the calculation date that would be incurred during the term of the liability for that policy. Considerations in determining the term of the liability for life and health (accident and sickness) insurance are discussed in section 2300.
- .24 The tax cash flows are limited to those generated by premiums, benefits, claims, and expenses, and by the assets that support the insurance contract liabilities. The expense cash flows are limited to those generated by the relevant policies, including overhead allocations. The tax and expense cash flows exclude, for example, tax on investment income from, and the investment expense of, assets that support capital.
- .25 The actual timing of cash flow for a given policy may occur beyond the term of its liabilities as a result of lag between an insured event (e.g., the incurring of a claim) and its 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 that has a long settlement period.

#### **Retrospective premium, commission, and similar adjustments**

- .26 In determining the value of a contractual right of the insurer to future premiums that depend on past claims experience, the actuary would take account of creditworthiness of the policy owner.

### **Experience rating refunds**

- .27 The liability for experience rating refunds would take account of
- The assumptions used in calculating the insurance contract liabilities in respect of those matters which determine experience rating refunds;
  - The difference between the basis for the insurance contract liabilities and the corresponding basis in the experience rating; and
  - Any cross-rating across coverages in the experience rating.
- .28 The experience rating refund element of the insurance contract liabilities would include provision for adverse deviations only for
- Risk of misestimation of interest rates and risk of interest rate changes; and
  - Uncertainty in the calculation of the experience rating refund.
- .29 The experience rating refund element of the insurance contract liabilities would not be negative except to the extent that in settlement it may be offset against another liability or recovered from policy owners.
- .30 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 insurance contract liabilities if necessary.

### **Reinsurance ceded and retroceded**

- .31 The estimated amount of recovery on account of reinsurance ceded would take account of the financial condition of the reinsurer.
- .32 The actuary would assume that the insurer and the reinsurer each exercises its rights under a treaty (e.g., recapture, cancellation or commutation) to its advantage.

### **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 policy owner options

- .34 Examples of policy owner 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 that 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 that support its insurance contract liabilities.
- .37 To take account of the time value of money is to express the forecast of periodic future cash flows as an equivalent single amount at the calculation date, thereby reflecting in the value of the liabilities the amount of future investment income forecast to be earned on the supporting assets. There are two common methods of doing so – a roll-forward approach (e.g., the Canadian asset liability method) and a discounting approach (e.g., the actuarial present value method).
- .38 The discount rates and forecast of supporting assets used in the valuation, would take account of
- The supporting assets owned at the calculation date;
  - The insurer's policy for asset-liability management; and
  - Assumptions about investment return after the calculation date.

- .39 The actuary would value the insurance contract liabilities and reinsurance recoverables so that their aggregate value in combination with the value of other policy-related items in the statement of financial position appropriately takes account of the time value of money.

#### **Margin for adverse deviations**

- .40 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.
- .41 Where ceded reinsurance is involved, the sign (positive or negative) of a margin for adverse deviations for a given assumption would take account of the impact of the assumption on assumed recapture, cancellation, commutation, or other treaty provisions and of the corresponding impact on insurance contract liabilities net of reinsurance recoverables.

### **2130 Reporting**

- .01 The actuary's report should describe
- The valuation and presentation of policy liabilities and reinsurance recoverables for the insurer's statement of financial position and statement of income;
  - The actuary's opinion on the appropriateness of those liabilities and recoverables 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. [Effective April 15, 2017]

- .02 If 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;

otherwise the actuary should modify the standard reporting language to report with reservation. [Effective February 1, 2018]

- .03 The actuary's report would conform to relevant Canadian federal and provincial legislation that require the actuary to value the policy liabilities, not only the insurance contract liabilities and related reinsurance recoverables.



### **Accounting in the statement of financial position**

- .04 The amount of the insurance contract liabilities is usually the largest amount in the statement of financial position, so that the disclosure of its main components is desirable.
- .05 The reference to “policy liabilities”, “insurance contract liabilities” and “reinsurance recoverables” in the standard reporting language is adequate if the notes to the financial statements or their accompanying management discussion and analysis verbally define “insurance contract liabilities” and “reinsurance recoverables”, and the statement of financial position presents their total amount as a separate item.

### **Accounting in the statement of income**

- .06 The standard reporting language implies that the statement of income accounts for the total change in the policy liabilities, consisting of the insurance contract liabilities and the liabilities for policies other than insurance contracts, during the financial reporting period, and that it accounts for the total change in reinsurance recoverables. That accounting is direct in the case of a life insurer’s insurance contract liabilities and reinsurance recoverables, whose change is presented as a separate item in the statement of income. That accounting may be indirect in the case of other policy liabilities, if their change is not separately presented, but is included within other items in the statement of income. For example, the item incurred claims would be equal to
- Claims and claim expenses paid during the financial reporting period; plus
  - Claim liabilities (which are part of the policy liabilities) at the end of the financial reporting period; minus
  - Claim liabilities at the beginning of the financial reporting period.

Such indirect accounting would be considered fair presentation, as would the direct accounting presentation.

### **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 signals 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 that 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. In the absence of 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 or repatriated on the actuary’s advice;
  - Off-balance-sheet obligations (e.g., contingent policy liabilities in connection with market conduct);
  - Restatement of items for preceding financial reporting periods;
  - Inconsistency among financial reporting periods;
  - The impracticality of restating any items that are reported in current period financial statements and that were reported inconsistently in preceding period financial statements;
  - 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 that does not have an effect in the current financial reporting period but that is expected to have an effect in future financial reporting periods;
  - A difference between the insurer’s present practices (e.g., policy for setting dividend scales) and those which the actuary assumed in valuing the policy liabilities; and
  - A subsequent event.

**Consistency across financial reporting periods**

- .10 Financial statements usually present results for one or more preceding financial reporting periods in comparison to those for the current period. Meaningful comparability requires the financial statement items for the various periods to be consistent, which can be achieved by the restatement of preceding period items that were previously reported on a basis which was inconsistent with that for the current period. A less desirable alternative to restatement is disclosure of the inconsistency.
- .11 A change in the method of valuation creates an inconsistency. A change in the assumptions for valuation reflecting a change in the expected outlook does not constitute an inconsistency although, if its effect is material, then fair presentation would require its disclosure.
- .12 A change in assumptions that results from the application of new standards may create an inconsistency.

### Communication with the auditor

- .13 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;
  - The drafting of common features in the auditor's report and actuary's report;
  - The drafting of a report with reservations;
  - The presentation of the insurance contract liabilities, policy liabilities other than insurance contract liabilities, and the reinsurance recoverables; and
  - The treatment of subsequent events.

### Description of the actuary's role

- .14 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.
- .15 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 [and reinsurance recoverables] are in accordance with accepted actuarial practice in Canada, applicable legislation, and associated regulations and directives;

required to provide an opinion on the appropriateness of the policy liabilities [net of reinsurance recoverables] at the calculation date to meet all policy 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 analyze 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."

The wording of the illustrative description conforms to relevant Canadian federal and provincial legislation that require the actuary to value the policy liabilities, not only the insurance contract liabilities.

### Standard reporting language

- .16 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 [and reinsurance recoverables] of [the Company] for its [consolidated] [statement of financial position] at [31 December xxxx] and their changes in the [consolidated] [statement of income] for the year then ended in accordance with accepted actuarial practice in Canada including selection of appropriate assumptions and methods.

In my opinion, the amount of policy liabilities [net of reinsurance recoverables], makes appropriate provision for all policy 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

- .17 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.
- .18 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.

#### Reservations in reporting

- .19 The examples that follow are illustrative and not exhaustive.

**Self-insured organization that is not obligated to have an appointed actuary**

- .20 Here is an example of a report prepared for an underfunded self-insured organization that is not obligated to have an appointed actuary.

I have valued the outstanding claim liabilities of [the Self-Insured Liability Plan] for its statement of financial position at [31 December xxxx] in accordance with accepted actuarial practice in Canada, including selection of appropriate assumptions and methods.

As explained in Note [XX], the [Plan's] self-insured 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**

- .21 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 [and reinsurance recoverables] of [the Company] for its [consolidated] statement of financial position 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 in Canada, including selection of appropriate assumptions and methods.

The policy liabilities [and reinsurance recoverables] at [31 December xxxx-1] were valued by another actuary who expressed a favourable opinion without reservation, as to their appropriateness.

In my opinion, the amount of policy liabilities [net of reinsurance recoverables], makes appropriate provision for all policy 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.

- .22 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.

### **Impracticality of restatement**

- .23 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:

In my opinion, the amount of policy liabilities [net of reinsurance recoverables] makes appropriate provision for all policy obligations. As explained in Note [XX], the method of valuation for the current year is inconsistent with that for the previous year. Except for that lack of consistency, in my opinion the [consolidated] financial statements fairly present the results of the valuation.

- .24 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.

### **Takeover of insurer with insufficient records**

- .25 If the insurer took over another insurer with records that did not provide sufficient and reliable data for the valuation, then the actuary would modify the standard reporting language as follows:

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

During the year, [the Company] took possession of the assets, liabilities, and policies of [WWW Insurer], whose policy records are, in my opinion, unreliable. [The Company] is implementing but has not completed the necessary improvements. My valuation with respect to the policies taken over from [WWW Insurer] therefore involves an unusual degree of uncertainty. The associated policy liabilities [net of reinsurance recoverables] comprise [N]% of [the Company's] total policy liabilities [net of reinsurance recoverables] at [31 December xxxx].

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

**Liabilities greater than those calculated by the actuary**

- .26 If the financial statements of an insurer report policy liabilities, net of reinsurance recoverables, that 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 doing so, then the actuary would report as follows:

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

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

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

## 2200 Insurance Contract Valuation: Property and Casualty Insurance

### 2210 Scope

- .01 This section 2200 applies in accordance with subsection 2110.

### 2220 Claim liabilities

.01 The amount of the claim liabilities should be equal to the present value, at the calculation date, of cash flow on account of claims (and of related expenses and future income taxes) incurred on or before that date with provision for adverse deviations. [Effective April 15, 2017]

- .02 The amount of claim liabilities consists of the following components on a present value basis:

- The amount of the case estimates;
- A provision (which may be positive or negative) for development on reported claims, including claim adjustment expenses;
- A provision for incurred but unreported claims, including claim adjustment expenses; and
- A provision for adverse deviations.

For property and casualty practitioners, this is also referred to as the actuarial present value basis.

- .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 affecting the work. The actuary would usually consider several methods, each of which involves assumptions.



- .07 The actuary would consider the circumstances affecting the work 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 legal, regulatory, and legislative environment; or
  - Residual mechanisms, like the Facility Association.
- .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**

- .01 The amount of the premium liabilities (after deducting any deferred policy acquisition expense asset) should be equal to the present value, at the calculation date, of cash flow on account of premium development and of the claims, expenses and future income taxes, including provision for adverse deviations, to be incurred after that date on account of the policies in force at that date or an earlier date. [Effective April 15, 2017]
- .02 The amount of premium liabilities consists of the following components on a present value basis:
- The future claims and claim adjustment expenses;
  - A provision for adverse deviations;
  - The expected reinsurance costs (on a net basis only);
  - The maintenance costs;
  - All other liabilities related to premium development; and
  - A premium deficiency, if any.
- .03 The actuary would consider the Standards of Practice for claim liabilities in selecting assumptions about claims.

- .04 Premium development includes additional premiums such as reinstatement premiums and experience adjustments for policies with retrospective pricing.
- .05 Premium deficiency is the amount which, when added to the net unearned premium reserve and unearned (reinsurance) commissions, makes an appropriate provision for future costs arising from the unexpired portion of in-force policies at the calculation date.

## **2240 Present values**

- .01 The expected investment return rate for calculation of the present value of cash flows, net of reinsurance, is that to be earned on the assets, taking into account reinsurance recoverables, that support the insurance contract liabilities. The expected investment return depends on
  - The assets owned at the calculation date;
  - The allocation of those assets and related investment income among lines of business;
  - The method of valuing assets and reporting investment income;
  - The yield on assets acquired after the calculation date;
  - The capital gains and losses on assets sold after the calculation date;
  - Investment expenses; and
  - Losses from asset depreciation.
- .02 The expected investment return rate for calculation of the present value of ceded cash flow may be selected from the following or a combination thereof:
  - The investment return rate selected for net present value net of reinsurance (i.e., as described in paragraph 2240.01);
  - A risk-free rate; and
  - The investment return rate used by the assuming company.
- .03 The actuary need not verify the existence and ownership of the assets at the calculation date, but would consider their quality.

## 2250 Margin for adverse deviations – general

- .01 The criteria for selection of the margin for adverse deviations for an assumption are based upon the considerations for that assumption. The selected margin for adverse deviations used in the valuation of insurance contract liabilities should tend toward a higher margin for adverse deviations to the extent that the considerations for that assumption, 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 a lower margin for adverse deviations to the extent that the opposite is the case. [Effective April 15, 2017]
- .02 The selected margin for adverse deviations 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 the considerations of paragraphs 2250.08 and 2250.09 so vary. [Effective April 15, 2017]

### Assumptions subject to a margin for adverse deviations

- .03 The actuary would include a margin for adverse deviations in the assumptions for
- Claims development;
  - Recovery from reinsurance ceded; and
  - Investment return rates.

### Expression of a margin for adverse deviations

- .04 The margin for adverse deviations for claims development would be a percentage of the claim liabilities excluding provision for adverse deviations.
- .05 The margin for adverse deviations for recovery from reinsurance ceded would be a percentage of the amount deducted on account of reinsurance ceded in calculating the premium liabilities or claim liabilities, as the case may be, excluding provision for adverse deviations.

- .06 The margin for adverse deviations for investment return rate would be a deduction from the expected investment return rate per year.
- .07 The actuary would not usually include a margin for adverse deviations in the other assumptions. An example of an unusual circumstance that warrants an exception is a salvage and subrogation assumption when presented as an asset separate from the claim liabilities.

**Considerations**

- .08 The actuary would select and evaluate considerations for each assumption that 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 risk of asset depreciation; and
  - The external environment, for example, the effect of regulatory change on claim settlements.
- .09 A consideration for an assumption reduces confidence in that assumption as a result of past or future instability of the consideration or a shortcoming in its quality, quantity, or performance. Significant considerations indicating difficulties in properly estimating the best estimate assumption would include, but would not be limited to
- Instability in the guidelines for setting and reviewing case estimates possibly resulting in inconsistent development among accident years;
  - The credibility of the company's experience being too low to be the primary source of data;
  - Future experience being difficult to estimate;
  - Lack of homogeneity in the cohort of risks;
  - Operational risks adversely affecting the likelihood of obtaining the best estimate assumption;
  - Past experience not being representative of the future experience and the experience possibly deteriorating; or
  - The derivation of the best estimate assumption being unrefined.

## 2260 Margin for adverse deviations – deterministic analysis

.01 The actuary should select a margin for adverse deviations for an assumption that is at least as much as the amount defined by the low margin for adverse deviations and is not excessive. [Effective April 15, 2017]

.02 The range of margin for adverse deviations would be

	<u>High</u>	<u>Low</u>
<u>claims development</u>	20%	2.5%
<u>recovery from reinsurance ceded</u>	15%	0
<u>investment return rates</u>	200 basis points	25 basis points

.03 Usually, a selection above this high margin for adverse deviations would be considered excessive.

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

.05 A selection below the low margin for adverse deviations may be appropriate in unusual situations. For example, in a situation wherein the best estimate discount rate based on the insurer's asset portfolio is less than 0.25% per annum, a margin for adverse deviations for investment return rates below that specified in paragraph 2260.02 may be reasonable. Similarly, unique situations may support a claims development margin for adverse deviations below that specified in paragraph 2260.02, as in the case of an insurer with aggregate stop loss coverage that is reserved at the stop loss limit.

## 2270 Margin for adverse deviations – stochastic analysis

.01 The margin for adverse deviations selected based on stochastic techniques should not be less than the low margin for adverse deviations set out in paragraph 2260.02 and should not be excessive. [Effective April 15, 2017]

.02 It is expected that margins for adverse deviations obtained using stochastic techniques would generally be consistent with the range provided in paragraph 2260.02.

- .03 In addition to the circumstances described in paragraph 2260.04, a selection above the high margin for adverse deviations set out in paragraph 2260.02 may be appropriate when stochastic modelling indicates variability in estimates of insurance contract liabilities that may not be identified using deterministic analysis.
- .04 A selection below the low margin for adverse deviations may be appropriate as set out in paragraph 2260.05.

## 2300 Insurance Contract Valuation: Life and Health (Accident and Sickness) Insurance

### 2310 Scope

- .01 This section 2300 applies in accordance with subsection 2110.

### 2320 Method

- .01 The actuary should calculate insurance contract liabilities net of reinsurance recoverables by the Canadian asset liability method. [Effective April 15, 2017]
- .02 The amount of insurance contract liabilities using the Canadian asset liability method for a particular scenario is equal to the amount of supporting assets, including reinsurance recoverables, at the calculation date that are forecast to reduce to zero coincident with the last liability cash flow in that scenario. [Effective April 15, 2017]
- .03 The term of the liabilities should take account of any renewal, or any adjustment equivalent to renewal, after the calculation date if
- The insurer's discretion at that renewal or adjustment is contractually constrained; and
  - Insurance contract liabilities are larger as a result of taking account of that renewal or adjustment. [Effective April 15, 2017]
- .04 In forecasting the cash flow expected to be generated by an insurance contract, the actuary should
- Take account of policy owner reasonable expectations; and
  - Include policy dividends, other than the related transfers to the shareholders' account and other than ownership dividends, in the comprised cash flow from benefits. [Effective April 15, 2017]
- .05 The actuary should calculate insurance contract liabilities for multiple scenarios and adopt a scenario whose insurance contract liabilities make sufficient but not excessive provision for the insurer's obligations in respect of the relevant policies. [Effective April 15, 2017]

- .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. [Effective April 15, 2017]
- .07 The scenario-tested assumptions should include at least the interest rate assumptions. [Effective April 15, 2017]
- .08 The scenarios of interest rate assumptions should comprise
- A base scenario, as defined under paragraph 2330.14;
  - Each of the prescribed scenarios in a deterministic application;
  - Stochastic scenarios, as defined in subsection 2370, in a stochastic application; and
  - Other scenarios appropriate for the circumstances of the insurer. [Effective April 15, 2017]

#### **Liability grouping and asset segmentation**

- .09 The actuary would usually apply the Canadian asset liability method to policies in groups that reflect the insurer's asset-liability management practice for allocation of assets to liabilities and investment strategy. That application is a convenience, however, and would not be expected to preclude the calculation of insurance contract liabilities and reinsurance recoverables 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 that 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 The value of the assets that support insurance contract liabilities at the calculation date would be their value in the insurer's financial statements.
- .12 The forecasted cash flow of the assets would take account of any related, off-balance sheet, financial instruments.



- .13 The value of the assets and forecasted cash flow would take account of the insurer's hedging instruments existing at the calculation date.
- .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 tax law.

**Term of the liabilities**

- .15 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.
- .16 The term of a policy's liabilities is not necessarily the same as the contractual term of the policy.
- .17 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 unilateral 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 that results from contractual obligations, legally binding commitments, and policy owner 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.
- .18 The term of a policy's liabilities takes account of all renewals and adjustments before the calculation date. Depending on the circumstances, that term may also take account of one or more renewals or adjustments after the calculation date.

- .19 If the term of the liabilities is not evident, and if selection of a longer term would reduce insurance contract 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 that is in form an annual premium life insurance policy may be in substance a single premium deferred annuity.
- .20 The term of the liabilities of
- An insurance contract that has been cancelled by the insurer ends at the effective date of cancellation;
  - An insurance contract that has not been cancelled, but that 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 contract ends at the last day to which the policy owner may prolong its coverage without the consent of the insurer; and
  - A certificate of group insurance if the group insurance contract is in effect a collection of individual insurance contracts is the same as if it were an individual insurance contract, unless contributions or experience rating of the group negate anti-selection by certificate holders.
- .21 The term of the liabilities of any other insurance contract ends at the earlier of
- The first renewal or adjustment date at or after the calculation date at which there is no constraint; and
  - The renewal or adjustment date after the calculation date that maximizes the insurance contract liabilities.

- .22 The actuary would extend or amend such term as defined in paragraphs 2320.20 and 2320.21 only
- 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 insurance contract; 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; or
- For the purpose of the valuation of liabilities related to segregated fund guarantees, as set out in subsection 2360.
- .23 The balance of the allowance for acquisition expense 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 that 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 calculation date, and where not fully recoverable at the calculation date, is written down to the recoverable amount, with the expected amount of write-down in each future period proportionately reduced.
- .24 A change in the outlook may provoke a change in the term of the insurance contract's liabilities. For example, the constraint of a cost of insurance guarantee that previously lengthened the term of the insurance contract liabilities may no longer do so if the outlook for mortality improves. On the other hand, the constraint of a guaranteed credited interest rate that previously was considered innocuous may become meaningful, and thereby lengthen the term of the insurance contract liabilities, if the outlook changes to one of lower interest rates.

- .25 For example, the term of the liabilities ends at
- The calculation date for the general account portion of a deferred annuity with segregated fund liabilities but without minimum guarantees (other than a guarantee of an annuity purchase rate); for example, with no guarantee of the segregated fund value;
  - The date after the calculation date that maximizes the insurance contract liabilities for guarantees of the fund value for segregated fund annuities whose contracts have no material constraints, and for consistency, for those contracts that contain material constraints;
  - The first renewal of a group policy that 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 insurance contract liabilities.

**Policy owner reasonable expectations**

- .26 The insurer's policies contractually define its obligations to its policy owners. The contractual definition may leave certain matters to the insurer's discretion, such as
- The determination of policy dividends, experience-rating refunds, and retrospective commission adjustments; and
  - The right to adjust premiums.
- .27 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.

- .28 Policy owner reasonable expectations are the expectations that
- May be imputed to policy owners 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 policy dividend and investment performance illustrations at sale of a policy and that of intermediaries reasonably perceived as acting on its behalf.
- .29 In selecting assumptions for the insurer's exercise of discretion in those matters, the actuary would take policy owner reasonable expectations into account. Taking account of policy owner reasonable expectations may affect not only the amount of insurance contract liabilities but also disclosure in the financial statements.
- .30 The determination of policy owner 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 policy owner reasonable expectations.
- .31 If the insurer makes a change that will eventually alter policy owner reasonable expectations, then the actuary would consider both the appropriate disclosure of the change in policy owner communication and the financial statements, and the time elapsed before the altered expectations crystallize.
- .32 A dispute over policy owner reasonable expectations may lead to class action or other litigation by policy owners against the insurer, which may affect insurance contract liabilities or generate contingent liabilities.
- Policy dividends**
- .33 The assumed cash flow from policy 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.

- .34 The assumed cash flow from policy dividends would avoid omission and double counting with other elements of the insurance contract liabilities and with liabilities other than insurance contract liabilities. For example, if the actuary has valued the insurance contract liabilities for participating 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 policy dividends would be reduced for that excess provision for adverse deviations.
- .35 The selected policy dividend scales in a particular scenario would be consistent with the other elements of that scenario, but would take account of how insurer inertia, policy owner 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 trigger a change in it.
- .36 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 policy owner reasonable expectation, then the actuary would assume such response.
- .37 An assumption of cash dividends to all policy owners is appropriate only if the alternative options to cash have equivalent value. If the alternatives do not have equivalent value, the actuary would
- Either adjust the cash dividends to reflect the non-equivalence or make explicit assumption about policy owner exercise of the various dividend options; and
  - Provide for the anti-selection that will result from increasing exercise of the more valuable options.

**Forecast of cash flow**

- .38 In calculating insurance contract liabilities, the actuary would allocate assets to the liabilities at the calculation 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.
- .39 Use of the work of another person may be appropriate for forecasting the cash flow of certain assets, such as real estate.

### Income tax and alternative tax

- .40 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”).
- .41 The cash flow from such taxes would be limited to that in respect of the relevant insurance contracts and the assets that support their insurance contract 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 that support the insurer’s capital). For a particular scenario, forecasted income before tax is equal to zero in each financial reporting period after the calculation 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 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.
- .42 An example of a temporary difference is a difference between insurance contract liabilities and the corresponding tax liabilities.
- .43 An example of a permanent difference is a preferential tax rate on the investment income on a class of assets.
- .44 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 calculation date, and of alternative taxes incurred after the calculation date.
- .45 The actuary would make appropriate provision for cash flow on account of such taxes in the insurance contract liabilities. If the insurer’s statement of financial position records a future tax asset or liability in respect of such taxes, then, in order to avoid double counting, the actuary would adjust the insurance contract liabilities otherwise calculated upward to reflect the existence of a future tax asset and downward to reflect the existence of a future tax liability.

- .46 The realization of negative tax depends on the simultaneous availability of income that is otherwise taxable. In forecasting such income, the actuary would
- 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 insurance contract liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

#### **Adverse deviations borne by policy owners**

- .47 The insurance contract liabilities need not make provision for adverse deviations to the extent that the insurer can offset its effect by adjustments to policy dividends, premium rates, and benefits. The insurer's contractual right of such offset may be constrained by policy owner reasonable expectations, competition, regulation, administrative delays, and the fear of adverse publicity or anti-selection.
- .48 In some jurisdictions, regulatory approval may be required for the application of such contractual pass-through features and, in such cases, the actuary would consider the ability to recover past losses, the clarity of any regulatory rules for approval, time delays caused by the approval process, and whether interest losses during this period can be recouped in determining an appropriate total provision.

#### **Adoption of a scenario**

- .49 If the selection of scenarios is deterministic, then the actuary would adopt a scenario whose insurance contract liabilities are within the upper part of the range of the insurance contract liabilities for the selected scenarios. In the case of interest rate scenarios, the insurance contract liabilities would not be less than those in the prescribed scenario with the largest insurance contract liabilities.
- .50 If the selection of scenarios is stochastic, then the actuary would establish insurance contract liabilities that are within the range defined by
- The average of the insurance contract liabilities that are above the 60<sup>th</sup> percentile of the range of insurance contract liabilities for the selected scenarios; and
  - The corresponding average for the 80<sup>th</sup> percentile.

#### **Scenario-tested assumptions**

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



### Other assumptions

- .52 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.
- .53 The assumptions unique to a particular scenario are the scenario-tested assumptions and each other assumption that is correlated with them. For example, policy 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.

### Margin for adverse deviations

- .54 The margin for adverse deviations would be at least the average of the applicable high and low margin, as specified in subsections 2340 and 2350, 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 calculation date and the last cash flow,
- An investment strategy; and
  - An interest rate for each risk-free asset and the corresponding credit spread for each fixed-income asset subject to depreciation.
- .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, depreciation risk classification, and term of the invested assets that support insurance contract liabilities. Assumption of an investment strategy implies investment decisions of reinvestment and disinvestment consistent 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 and would be consistent with the insurer's expected practice. The insurance contract liabilities would make no provision for any increased risk that may result from a future change in the insurer's investment policy. The insurer's expected practice would be determined without taking into consideration any business that could be issued after the valuation date (new sales).

- .06 The actuary would ensure that the proportion of non-fixed-income assets in the portfolio, at each duration, would be in accordance with the insurer's current investment policy.
- .07 The number of assumed terms of risk-free 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 In all scenarios other than the base scenario, credit spreads include margins for adverse deviations as described in paragraph 2340.14. The actuary would also include an additional provision for adverse deviations by modifying the assumptions, if needed, on each fixed-income asset purchased or sold on or after the 5<sup>th</sup> anniversary from the calculation date, such that
- For assets purchased or sold on or after the 30<sup>th</sup> anniversary from the calculation date, the difference between the asset's credit spread and its asset depreciation assumption, the net credit spread is not larger than a maximum promulgated from time to time by the Actuarial Standards Board; and
  - For assets purchased or sold between the 5<sup>th</sup> and 30<sup>th</sup> anniversary from the calculation date, the net credit spread is not larger than that determined using a uniform transition between the corresponding difference if the asset were purchased on the 5<sup>th</sup> anniversary from the calculation date and the promulgated maximum if the asset were purchased on the 30<sup>th</sup> anniversary from the calculation date.
- .09 A scenario for a foreign country's interest rates would be formulated independently of that for Canadian interest rates unless a positive historical correlation is expected to continue.
- .10 The importance of the assumptions for a particular forecast period depends on the magnitude of the net forecasted cash flow for that period.
- .11 The Actuarial Standards Board will promulgate from time to time the following ultimate risk-free reinvestment rates for use in the base scenario and the prescribed scenarios
- Short-term ultimate risk-free reinvestment rate-high;
  - Long-term ultimate risk-free reinvestment rate-high;
  - Short-term ultimate risk-free reinvestment rate-median;
  - Long-term ultimate risk-free reinvestment rate-median;
  - Short-term ultimate risk-free reinvestment rate-low; and
  - Long-term ultimate risk-free reinvestment rate-low.

- .12 Ultimate risk-free reinvestment rates at other terms would be determined in accordance with the historical relationship between rates at those terms and the short- and long-term rates. Ultimate risk-free reinvestment rate-low refers to low rates at all terms (including short-term ultimate risk-free reinvestment rate-low and long-term ultimate risk-free reinvestment rate-low), and similarly for ultimate risk-free reinvestment rate-median and ultimate risk-free reinvestment rate-high.
- .13 The parameters in the base and prescribed scenarios, including maximum net credit spreads, apply to investments denominated in Canadian dollars. For the base and 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.

**Base scenario**

- .14 In the base scenario,
- Risk-free interest rates effective after the calculation date would be equal to the forward interest rates implied by the equilibrium risk-free market curve at that date, for the first 20 years after the calculation date;
  - At and after the 60<sup>th</sup> anniversary from the calculation date, risk-free interest rates would be equal to the ultimate risk-free reinvestment rate-median;
  - At the 40<sup>th</sup> anniversary from the calculation date, the risk-free interest rates would be equal to 30% of the rates at the 20<sup>th</sup> anniversary plus 70% of the rates at the 60<sup>th</sup> anniversary;
  - Between the 20<sup>th</sup> and 40<sup>th</sup> and between the 40<sup>th</sup> and 60<sup>th</sup> anniversaries, the risk-free interest rates would be determined using a uniform transition; and
  - Credit spreads at all durations would be the best estimate described in paragraph 2340.12.
- .15 The provision for adverse deviations for interest rate risk for both deterministic and stochastic applications would be measured as the difference between the reported insurance contract liabilities and the insurance contract liabilities resulting from the application of the base scenario.

### Prescribed scenarios

- .16 Because future investment returns and inflation rates are so conjectural, it is desirable that the calculation of insurance contract liabilities for all insurers takes account of certain common assumptions. There are, therefore, eight prescribed scenarios as presented below.
- .17 The prescribed scenarios apply to fixed-income assets purchased or sold after the calculation date.
- .18 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 2330.19.
- .19 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 repayable soon by subsequent positive forecasted net cash flow.

### Prescribed scenario 1

- .20 The risk-free interest rates for investments purchased or sold
- At the calculation date are those available in the market;
  - At the 40<sup>th</sup> anniversary from the calculation date and beyond, the risk-free interest rates are equal to ultimate risk-free reinvestment rate-low;
  - At the 1<sup>st</sup> anniversary from the calculation date, the risk-free interest rates are equal to 90% of the risk-free interest rates at the calculation date;
  - At the 20<sup>th</sup> anniversary of the calculation date, the risk-free interest rates are equal to 10% of the risk-free interest rates at the calculation date plus 90% of ultimate risk-free reinvestment rate-low; and
  - Between each of the calculation date and the 1<sup>st</sup>, 20<sup>th</sup>, and 40<sup>th</sup> anniversaries, the risk-free interest rates are determined using a uniform transition.

### Prescribed scenario 2

- .21 This scenario is the same as prescribed scenario 1, with the ultimate risk-free reinvestment rate-low replaced by the ultimate risk-free reinvestment rate-high, and the 90% multiplier applicable on the 1<sup>st</sup> anniversary replaced by 110%.

### Prescribed scenario 3

- .22 The oscillation period for use in prescribed scenarios 3 to 6 is 20 years.

- .23 The long-term risk-free interest rate moves cyclically between long-term ultimate risk-free reinvestment rate-low and long-term ultimate risk-free reinvestment rate-high as follows:
- Over the first quarter oscillation period, the long-term risk-free interest rate moves uniformly from the long-term interest rate at the calculation date to 75% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-low);
  - Over the next quarter oscillation period, the long-term risk-free interest rate moves uniformly from 75% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-low) to long-term ultimate risk-free reinvestment rate-low;
  - Over the next half oscillation period, the long-term risk-free interest rate moves uniformly from the long-term ultimate risk-free reinvestment rate-low to the long-term ultimate risk-free reinvestment rate high; and
  - This cycle is repeated for the remaining oscillation periods.
- .24 The short-term risk-free interest rate moves as follows:
- Over the first quarter oscillation period, the short-term risk-free interest rate moves uniformly from the short-term interest rate at the calculation date to 50% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-low);
  - Over the next quarter oscillation period, the short-term risk-free interest rate moves uniformly from 50% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-low) to 60% of the corresponding long-term interest rate; and
  - Thereafter remains at 60% of the corresponding long-term interest rate.
- .25 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

- .26 This scenario is similar to prescribed scenario 3, but with the peaks of prescribed scenario 3 coinciding with the troughs of prescribed scenario 4. Over the first quarter oscillation period, the long-term risk-free interest rate moves uniformly from the long-term risk-free interest rate at the calculation date to 125% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-high). Over the next quarter oscillation period, the long-term risk-free interest rate moves uniformly from 125% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-high) to long-term ultimate risk-free reinvestment rate-high. Over the next half oscillation period, the long-term risk-free interest rate moves uniformly from the long-term ultimate risk-free reinvestment rate-high to the long-term ultimate risk-free reinvestment rate-low, and this cycle is repeated for the remaining oscillation periods.
- .27 The short-term risk-free interest rate moves as follows:
- Over the first quarter oscillation period, the short-term risk-free interest rate moves uniformly from the short-term interest rate at the calculation date to 150% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-high);
  - Over the next quarter oscillation period, the short-term risk-free interest rate moves uniformly from 150% of (80% of the risk-free interest rates at the calculation date plus 20% of ultimate risk-free reinvestment rate-high) to 60% of the corresponding long-term interest rate; and
  - Thereafter remains at 60% of the corresponding long-term interest rate.

#### Prescribed scenario 5

- .28 This scenario is the same as prescribed scenario 3, except that the short-term risk-free interest rate at an anniversary of the calculation date is a percentage of the corresponding long-term risk-free interest rate. That percentage moves cyclically in 20% annual steps from 40% to 120% and back. The first cycle is irregular:
- Over the first quarter oscillation period, the short-term risk-free interest rate moves uniformly from the short-term interest rate at the calculation date to 40% of the corresponding long-term interest rate.
  - Thereafter the short-term risk-free interest rate moves cyclically in 20% annual steps from 40% to 120% and back.

### Prescribed scenario 6

- .29 As respects long-term risk-free interest rate, this scenario is the same as prescribed scenario 4.
- .30 As respects short-term risk-free interest rate, this scenario is the same as prescribed scenario 5, except that, over the first quarter oscillation period, the short-term risk-free interest rate moves uniformly from the short-term interest rate at the calculation date to 120% of the corresponding long-term interest rate. Thereafter the short-term risk-free interest rate moves cyclically in 20% annual steps from 120% to 40% and back.

### Prescribed scenario 7

- .31 The risk-free interest rates for investments purchased or sold
- At the calculation date are those available in the market;
  - At the 60<sup>th</sup> anniversary from the calculation date and beyond, are equal to 80% of the ultimate risk-free reinvestment rate-median;
  - At the 1<sup>st</sup> anniversary from the calculation date, are equal to 80% of the risk-free interest rates at the calculation date;
  - At the 20<sup>th</sup> anniversary from the calculation date, are equal to 80% of (30% of the risk-free interest rates at the calculation date plus 70% of ultimate risk-free reinvestment rate-median);
  - At the 40<sup>th</sup> anniversary from the calculation date, are equal to 80% of (10% of the risk-free interest rates at the calculation date plus 90% of ultimate risk-free reinvestment rate-median); and
  - Between each of the calculation date and the 1<sup>st</sup>, 20<sup>th</sup>, 40<sup>th</sup>, and 60<sup>th</sup> anniversaries, are determined using a uniform transition.

### Prescribed scenario 8

- .32 This scenario is the same as prescribed scenario 7, with the 80% replaced by 120%.

### Other scenarios

- .33 In addition to the prescribed scenarios, which would be common to the calculation of insurance contract liabilities for all insurers, the actuary would also select other scenarios that would be appropriate to the circumstances affecting the work. The reasonableness of degrees of change of interest rates would be largely dependent on the period of time being considered. Other plausible scenarios would include parallel shifts up and down as well as flattening and steepening of the yield curve.

- .34 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 policy allows a wide range of practice; or
  - Flexibility to manage assets or liabilities is limited.



## **2340 Other assumptions: Economic**

### **Margin for adverse deviations**

- .01 To set the level of the margin for adverse deviations as specified in paragraph 2320.54, significant considerations indicating difficulties in properly estimating the best estimate assumption would include
- There is little relevant experience;
  - Future experience is difficult to estimate;
  - Operational risks adversely affect 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-pass-through structure with a repackaging of the credit risk that is difficult to understand;
  - The asset held is from a lower-quality tranche from a structure that is not a pass-through structure that repackages credit risks;
  - There is uncertainty about the counterparty credit; or
  - There is no netting of the aggregate exposure with a counterparty.
- .02 Significant considerations indicative of a potential deterioration of the best estimate assumption would include situations where operational risks are present such that the likelihood of continuing to obtain the best estimate assumption is adversely impacted.

### **Fixed income assets: investment return**

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

### **Fixed income assets: asset depreciation**

- .04 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 investment, to the extent that it is indicative of the future, and the insurer's own experience;
  - The insurance industry's experience;
  - Guarantees that offset depreciation, such as that in an insured mortgage; and
  - Potential for anti-selection by borrowers and issuers.
- .05 Asset depreciation comprises that of both assets that are impaired at the calculation date and assets that become impaired after the calculation date, and includes loss of interest, loss of principal, and expense of managing depreciation.
- .06 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 would be an acceptable approximation unless it undermines the interest rate assumption in the scenario.
- .07 The actuary would not necessarily assume that the best estimate of asset depreciation is less than the asset's credit spread.
- .08 The low and high margins for adverse deviations for a scenario would be respectively 25% and 100% of the best estimate for that scenario, except that
- A higher range would be appropriate where those percentages of an unusually low best estimate are not meaningful; and
  - Zero would usually be appropriate for an Organisation for Economic Cooperation and Development (OECD) government's debt denominated in its own currency.

### **Fixed income assets: exercise of borrower and issuer options**

- .09 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.

- .10 The assumed exercise of an option may depend on the interest rates in the scenario. Anti-selection by commercial borrowers and issuers would usually occur systematically.
- .11 Forecasted cash flows would include any penalty generated by exercise of an option.

**Fixed income assets: credit spreads**

- .12 The best estimate of credit spreads
- Would be the credit spreads observable in the market at the calculation date;
  - At and after the 5<sup>th</sup> anniversary from the calculation date, would be based on long-term historical average credit spreads corresponding to assets by type, credit rating, and term; and
  - Between the calculation date and the 5<sup>th</sup> anniversary, would be determined using a uniform transition.
- .13 When choosing the best estimate of credit spreads based on long-term historical averages, the actuary would consider
- Using as long a period of history as practicable; and
  - Adjusting the assumptions to reduce any inconsistencies that may arise from using different historical periods or sources of information for different asset types, credit ratings, or terms.
- .14 The margin for adverse deviations in credit spreads would be
- Zero at the calculation date;
  - An addition or subtraction, as appropriate in aggregate, of 10% of the best estimate assumptions at and after the 5<sup>th</sup> anniversary from the calculation date; and
  - Between the calculation date and the 5<sup>th</sup> anniversary, the margin for adverse deviations as percentage of the best estimate would be determined using a uniform transition.

**Non-fixed income assets: investment return**

- .15 Where reliable historical data are available, the actuary would choose the best estimate of investment return on a non-fixed income asset (such as common shares, real estate and other non-fixed income portfolios) such that it would not be more favourable than a benchmark based on historical performance of assets of its class and characteristics.

- .16 Where the best estimate for a class of non-fixed income assets is based on reliable historical data, the margin for adverse deviations in the assumption of non-fixed income capital gains would be 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 would be 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 would be 30%; and
  - Of any other portfolio would be in the range of 20% to 50% depending on the volatility relative to a diversified portfolio of North American common shares.
- .17 Where the best estimate for a class of non-fixed income assets is based on reliable historical data, the low and high margins for adverse deviations in the assumptions of income on the class (for example, common share dividends and real estate rental income) would be respectively 5% and 20%. Furthermore, if the ratio of income (other than that fixed by agreement) to asset value increases following the assumed change in asset value described in paragraph 2340.16, the margin for adverse deviations in the assumption for income would be adjusted so the ratio five years after the assumed change in asset value is not higher than the ratio immediately before the assumed change in asset value.
- .18 Where reliable historical information is not available for a non-fixed income class of assets, the actuary would select a best estimate investment return assumption and margins for adverse deviations such that the assumed return in excess of risk-free interest rates, net of margins, would not exceed the assumed return in excess of risk-free interest rates, net of margins, for a similar asset class for which reliable historical information is available in the same jurisdiction, or in Canada if there is no relevant reliable historical information in the same jurisdiction.
- .19 Whether the assumed change is a gain or loss would depend on its effect on benefits to policy owners. A capital loss may reduce insurance contract liabilities as a result of that effect.

- .20 If non-fixed income assets are used to support liability cash flows that are not substantially linked to returns on non-fixed income assets, the actuary would include an additional provision for adverse deviations by modifying the assumed investment strategy in the scenario adopted, if needed, so that the amount of non-fixed income assets supporting such liability cash flows at the calculation date and at each duration in the projection does not exceed the amount required to support 20% of cash outflows for the first 20 years and 75% thereafter, where cash outflows are the greater of the annual liability cash flows and zero in each forecast period. The actuary would not consider this additional provision when selecting the scenario used to establish the insurance contract liabilities. This modification of the assumed investment strategy would be applied at each duration independently.

#### **Taxation**

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

#### **Foreign exchange**

- .22 The needed assumptions would include foreign exchange rates when insurance contract liabilities and their supporting assets are denominated in different currencies.
- .23 The base scenario used to develop the assumption for foreign exchange rates would be based on currency forwards. If currency forwards are not available, the forward exchange rates would be derived based on risk-free interest rate differentials where available. If neither is available, the actuary would use his or her best judgment to develop an appropriate approach.
- .24 A provision for adverse deviations would be developed from a scenario using adverse movements in the exchange rate. Such movements would reflect the historical volatility in the exchange rate over the applicable period. The provision for adverse deviations would be the excess of the insurance contract liabilities based on this adverse scenario over the insurance contract liabilities calculated using the base scenario.
- .25 A minimum provision for adverse deviations would apply. This would be the excess of the insurance contract liabilities resulting from the application of an adverse 5% margin to the projected exchange rates underlying the base scenario over the insurance contract liabilities calculated using the base scenario.

## 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 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 insurance contract liabilities that results from substitution of a conservative assumption for the best estimate assumption.
- .03 Significant considerations indicating difficulties in properly estimating the best estimate assumption would include
- 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 lacks homogeneity;
  - Operational risks adversely impact the likelihood of obtaining best estimate assumption; or
  - The derivation of the best estimate assumption is unrefined.
- .04 Significant considerations indicative of a potential deterioration of the best estimate assumption would include
- A significant concentration of risks and/or lack of diversification;
  - Operational risks that adversely affect the likelihood of continuing experience which is consistent with the best estimate assumption; or
  - Past experience that 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.

- .05 A selection above the high margin would be 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.

**Insured life mortality**

- .06 The actuary's best estimate of insured life 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.
- .07 The actuary would consider the inclusion of mortality improvement (a secular trend toward lower mortality rates) in the best estimate assumption and associated margin. The margin for adverse deviations related to the mortality improvement assumption is not restricted to the range of 5% to 20% noted in paragraph 2350.01.
- .08 If the inclusion of mortality improvement reduces the insurance contract liabilities, then the resulting reduction would be no greater than that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board. If, at an appropriate level of aggregation, the inclusion of mortality improvement increases the insurance contract liabilities, then the actuary's assumption would include such improvement. The resulting increase in insurance contract liabilities would be at least as great as that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board.
- .09 The low and high margins for adverse deviations for the mortality rates per 1,000 would be respectively an addition or subtraction, as appropriate, of 3.75 and 15, each divided by the curtate expectation of life at the life insured's projected attained age. These margins for adverse deviations are applied after mortality improvement.

### **Annuitant mortality**

- .10 The actuary's best estimate assumption of annuitant 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.
- .11 The insurance underwriting in a "back-to-back" insurance/annuity package may unfavourably affect the best estimate.
- .12 The mortality improvement assumption would include a best estimate assumption and an associated margin. The margin for adverse deviations related to the mortality improvement assumption is not restricted to the range of 5% to 20% noted in paragraph 2350.01. The actuary's assumption would include mortality improvement, the effect of which is to increase insurance contract liabilities, such that the resulting increase would be at least as great as that developed using prescribed mortality improvement rates as promulgated from time to time by the Actuarial Standards Board.
- .13 The low and high margins for adverse deviations for the mortality rates would be respectively a subtraction of 2% and 8% of the best estimate.
- .14 An additional significant consideration for the determination of the level of margin for adverse deviations would be the possibility of commuting survival dependent benefits after periodic payments have started.



## Morbidity

- .15 The actuary's best estimate of insured life 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;
- and would include the effect of any anti-selection.
- .16 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.
- .17 The low and high margins for adverse deviations would be, 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 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations would include

- Contract wording is not tight enough to protect against medical advances;
- Definitions of claim events are not precise and/or not protecting against potential anti-selection; or
- Interpretation of claim event definitions by the court 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;
- Policy owner 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 would be pertinent and usually credible. It would not be available for new products and for higher durations on recent products, which is a problem for the actuary if the insurance contract 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 would be a disincentive to withdrawal.

.22 Reinsurance assumed withdrawal rates would 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 remain at zero for an interval before the cliff is reached. The same would apply 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.
- .25 The low and high margins for adverse deviations would be, 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 insurance contract 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 would be needed, the amount withdrawn and the partial withdrawal rate.
- .26 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations in situations where a decrease in lapse rates increases the insurance contract liabilities would include
- Remuneration policy encouraging persistency; or
  - Cancellation of a contract being clearly detrimental to the policy owner.
- .27 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations in situations where an increase in lapse rates increases the insurance contract liabilities would include
- Remuneration policy encourages terminations;
  - Cancellation of a contract would be clearly beneficial to the policy owner;
  - 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

- .28 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 policies on healthy insured lives to lapse or unhealthy insured lives 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 would require 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. Policy owners will, however, make decisions in their own perceived interest, so that anti-selective lapse is plausible whenever that perceived interest is for policies on unhealthy lives not to lapse or for policies on healthy lives to lapse.
- .29 It is difficult to estimate with confidence the intensity of anti-selective lapse. It is plausible for the intensity to be proportional to the intensity of policy owner perceived interest. However, anti-selective lapse is merely a tendency provoked by the policy owner’s perceived interest. The policy owner may not know the true state of health of the life insured. The policy owner may imprudently favour, or be obliged by financial pressure to adopt, a short-term interest with long-term detriment; thus, a policy on an unhealthy life may lapse when the premium increases, the policy owner perceiving the policy to be no longer affordable. Through ignorance or inertia, a policy on a healthy life may be continued by a policy owner, even though it could be replaced by a superior one. Moreover, anti-selective lapse is not the unvarying effect of a decision in the policy owner’s perceived interest. For instance, a policy owner may lapse a policy on an unhealthy life, if the policy is no longer needed, or the policy on a healthy life may remain in force if the policy owner perceives a continuing need. Without pertinent and reliable experience, however, the actuary would not assume that the non-lapsation of policies on healthy lives favourably affects the mortality best estimate for the persisting insurance contracts.
- .30 The premise to the actuary’s assumptions would be that policy owners’ decisions
- Will tend to serve their perceived interest; and
  - Will not serve the insurer’s interest unless the two run together.

.31 Examples where the perceived interest of the policy owners of policies with healthy life insureds may be to lapse include

- Premium increase at renewal of term insurance;
- Unfavourable underwriting decision at renewal of re-entry term insurance;
- Benefit decrease or premium increase of adjustable insurance;
- Premium needed to avoid termination of universal life insurance with exhausted funding;
- Reduction in policy dividend scale;
- Offer or availability of a superior replacement policy, such as by the creation of preferred underwriting class;
- Significant but temporary increase (spike) in non-forfeiture value; and
- Downgrade in the insurer's credit rating.

**Expense**

.32 The actuary would select a best estimate assumption that 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 insurance contract liabilities. Other expense would include

- Expense related to policies that, for the relevant policies, was incurred before the calculation 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 that support capital.

.33 The assumption would provide for future expense inflation consistent with that in the interest rate scenario.

.34 A stable insurer's expense experience is pertinent if its expense allocation is appropriate for valuation of insurance contract liabilities (or if the actuary can correct the inappropriateness, e.g., by reallocating corporate expense to operating lines of business).

.35 A particular insurer may have an expectation of reduced expense rates, but the actuary would anticipate only a reduction that is forecasted with confidence.

- .36 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.
- .37 The insurer incurs neither cash rental expense nor cash rental income on real estate that it owns and occupies. The actuary would deem such expense and, if the real estate supports the insurance contract liabilities, such income at a reasonable rate in the selection of an assumption of expense and investment return.
- .38 Certain taxes are akin to expenses. The actuary would make similar provision for them in the insurance contract liabilities to the extent that they relate to the relevant insurance contracts 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.
- .39 The low and high margins for adverse deviations would be 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.
- .40 Additional significant considerations to be taken into account when determining the level of margin for adverse deviations would include
- 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;
  - Allocation is not an appropriate basis for the best estimate expense assumption;
  - Expense study does not adequately reflect the appropriate expense drivers; or
  - Future reductions in unit expenses (before inflation) are assumed.

### Policy owner options

- .41 Examples of policy owner options are options to
- Purchase additional insurance;
  - Convert term to permanent insurance;
  - Select the extended term insurance non-forfeiture option;
  - Make partial withdrawal from a universal life insurance policy;
  - Select the amount of premium for a flexible premium policy; and
  - Purchase an annuity at a guaranteed rate.
- .42 The actuary would select a best estimate assumption of policy owner exercise of both contractual options and extra-contractual options of which they have reasonable expectations.
- .43 The actuary's best estimate would depend on
- 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 policy owner and the intermediary;
  - Perceived self-interest of the policy owner and the intermediary;
  - Policy's competitiveness; and
  - Insurer's distribution system and other marketing practice;
- and would make provision for anti-selection.
- .44 The actuary would make provision for adverse deviations by testing the effect on insurance contract liabilities of plausible alternative assumptions of policy owner exercise of options and adopting one with relatively high insurance contract liabilities.

### Related assumptions

- .45 The actuary would consider how the assumptions may be interrelated in determining the best estimate assumptions and appropriate margins. In determining these interrelationships the actuary would take account of potential anti-selection. For example, the actuary would consider what the relationships among term conversions, withdrawals, and mortality might be as a contract nears the end of a term renewal period.

Other examples of how potential anti-selection might affect the selection of assumptions are provided above and in subsection 1620.

### 2360 Valuation of segregated fund insurance contract liabilities

- .01 This subsection addresses considerations applicable to the valuation of insurance contract liabilities related to guarantees provided under the terms of segregated fund contracts. While the requirements of subsections 2310 to 2350 apply generally to all life and health insurance contracts including segregated fund contracts, the nature of the insurance guarantees and other provisions of segregated fund contracts are such that this additional subsection is warranted to supplement, and to clarify the application of, the preceding requirements to such contracts.

#### Method

- .02 The actuary should calculate insurance contract liabilities for the guaranteed benefits of segregated fund contracts by the Canadian asset liability method using stochastic modelling. [Effective April 15, 2017]
- .03 If the bifurcated approach is used, the allocation of future fee revenue between recoverability testing of the allowance for acquisition expense and providing for the cost of guarantees should not change from period to period. [Effective April 15, 2017]
- .04 A factor-based approach, approved by a regulator, would be considered an appropriate approximation and the actuary would not need to undertake testing to determine the appropriateness of this approximation.



- .05 Either of two approaches would be appropriate to value segregated fund policies where guaranteed benefits are involved and an allowance for acquisition expense is being amortized.
- For the bifurcated approach, forecast fee revenue is allocated between recoverability testing of the allowance for acquisition expense and providing for the cost of the guarantees. Where the actuary can reasonably determine an additional charge priced into the contract to cover the cost of guarantees, the portion of revenue allocated to the guarantees would reflect such additional charge, with the remainder of revenue applied to test the recoverability of the unamortized allowance for acquisition expense. The insurance contract liability for the guarantees is calculated separately using the net cash flows allocated to the guarantees while the recoverability of the allowance for acquisition expense is tested excluding those revenues allocated to the guarantees.
  - For the whole contract approach, all general account net cash flows associated with segregated funds are considered in calculating the total liability, i.e., the liability for guaranteed benefits less the balance of unamortized acquisition expense. This total liability will change over the reporting period as a result of market movements and other factors and, therefore, may need to be adjusted to remove any write-up to the balance of the allowance for acquisition expense.
- .06 Under the bifurcation approach, the requirement to use the Canadian asset liability method applies to the calculation of the liability related to guaranteed benefits and to recoverability testing of the unamortized balance of the allowance for acquisition expenses; whereas under the whole contract approach, the Canadian asset liability method would be used to calculate the total liability. In either case, the balance of the allowance for acquisition expense 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 that 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 calculation date, and where not fully recoverable at the calculation date, is written down to the recoverable amount, with the expected amount of write-down in each future period proportionately reduced.

### **Term of the liability**

- .07 While the provisions of subsection 2320 concerning the term of the liability apply generally to segregated fund contracts, an exception to paragraph 2320.21 would apply to segregated fund contracts that contain material constraints. In this situation, the term of the liability would end at the date after the calculation date which maximizes the insurance contract liabilities, consistent with the treatment for contracts with no material constraints.
- .08 The actuary would extend the term of the liability as determined under subsection 2320
- To permit reflection of hedging arrangements related to segregated fund guarantees by considering both the value of the liability and its associated hedge, where the resulting statement of financial position presentation is consistent with market movements over the reporting period; and
  - Where such extension would be subject to constraints on the amount of net cash flow capitalized, consistent with an unhedged position.

### **Assumptions – non-economic**

- .09 In addition to considerations discussed in subsection 2350, the following considerations apply to the valuation of liabilities for segregated fund guarantees and recoverability testing of the allowance for acquisition expense.
- .10 The actuary's best estimate of withdrawal rates would depend on
- Extent to which the guaranteed values are greater or less than the market value of the funds;
  - Time to maturity;
  - Systematic withdrawal consistent with the contractual terms of the policies;
  - Market conditions; and
  - Distribution of investment income from the funds if such amounts are not automatically reinvested.
- .11 The actuary would select a best estimate assumption for management expense ratios (including all taxes charged to the fund such as GST) that varies by fund according to the terms of the contract and recent practice of the insurer. The actuary would not assume a change in management expense ratios in the future unless there is a clear and justifiable reason for doing so, taking into account past practices, competitive pressures, and reasonable policy owner reactions.

### Policy owner options

- .12 The actuary would assume the contract terminates on maturity unless allowing a proportion of the policy owners to roll their contracts over would increase the insurance contract liabilities. The proportion of policy owners that elect to roll their policies over would take into account the experience of the insurer. The actuary would test future maturity dates that the policy owner may elect and would use caution in setting this maturity date assumption.
- .13 The actuary would test the effect of fund transfers and shifting asset mix and would exercise caution in assuming that the status quo would be maintained indefinitely.
- .14 The actuary would test the effect of future optional deposits to the extent they can reasonably be anticipated and use caution in assuming that the status quo would be maintained indefinitely.
- .15 The actuary's best estimate of rates at which ratchet and reset options are exercised by policy owners would depend on the
- Extent to which the guaranteed values are greater than the market value of the funds;
  - Relationship of the fund value and guaranteed benefit amounts;
  - Term to maturity; and
  - Growth of funds.
- .16 If resets are discretionary, the actuary would assume that some proportion of policy owners would elect to exercise the reset option when it is in their financial best interest to do so. The actuary need not assume that all policy owners would act with absolute efficiency in an economically rational manner. However, the assumptions would allow the frequency of elective resets to vary according to the current and/or historical economic environment.
- .17 The actuary would consider the extent to which an increase in partial withdrawals on segregated funds might lead to deferrals in benefit commencement dates.

## 2370 Stochastic scenarios

- .01 Where the actuary uses stochastic modelling techniques to reflect assumptions for interest rates and/or investment returns, the development of scenarios should consider
- Selection of market indices and proxies;
  - Development of economic scenario generators and model parameters; and
  - Calibration of risk-free interest rates and investment returns (i.e., equity returns, bond fund returns and money market returns). [Effective April 15, 2017]
- .02 Where investment returns are stochastically modelled, the calibration of stochastic models used in the valuation should meet the criteria for investment returns as promulgated from time to time by the Actuarial Standards Board. [Effective April 15, 2017]
- .03 Where the interest rate scenarios selected are stochastically modelled, the actuary's calibration of stochastic models should meet the criteria for risk-free interest rates as promulgated from time to time by the Actuarial Standards Board. [Effective April 15, 2017].
- .04 Where valuation is performed using stochastic scenarios, the actuary would assign a value to the insurance contract liabilities which is within the range defined by
- The average of those values that are above the 60<sup>th</sup> percentile of the range of liability values produced by the entire set of modelled scenarios; and
  - The corresponding average for the 80<sup>th</sup> percentile.
- .05 Each average value referred to above is referred to as a conditional tail expectation and the specific average values described above can for simplicity be denoted by CTE[60] and CTE[80] respectively.
- .06 With respect to interest rate scenarios, the actuary would adopt a scenario where the insurance contract liabilities are higher than the midpoint of the range CTE[60] to CTE[80] whenever current long-term risk-free interest rates are near the limits or outside the range of long-term ultimate risk-free reinvestment rate-low to long-term ultimate risk-free reinvestment rate-high or whenever any of the considerations in paragraph 2330.34 exist.

### **Random number generators**

- .07 The random numbers generated by computer algorithms are called pseudorandom because they are not truly random. Knowing the algorithm and the seed to the sequence is sufficient to predict the next random number that will be generated. A sound pseudorandom number generator provides a sequence that is statistically indistinguishable from a truly random sequence from the given distribution. The actuary would test the random number generator to demonstrate that it provides a sequence that is statistically indistinguishable from a truly random sequence for the given distribution.
- .08 It would be preferable for the results from stochastic modelling to be reproducible, so that a repeatable pseudorandom number generator would be available to an auditor.

### **Number of scenarios**

- .09 The actuary would test that the number of scenarios used to calculate the insurance contract liabilities provides an acceptable level of precision that meets the standard of materiality. To increase the precision of the insurance contract liability calculation, it may be necessary to increase the number of scenarios significantly.
- .10 The actuary may consider scenario reduction techniques, such as stratified sampling, to reduce the number of scenarios on a sound statistical basis.

### **Modelling period**

- .11 The actuary would use a modelling period that is not longer than one month unless testing shows that the liability value is not sensitive to the frequency of election of benefits or features.

### **Economic scenario generators**

- .12 The actuary would develop stochastic models for each market index or proxy that is constructed.
- .13 The actuary would select economic scenario generators for stochastic models that are robust and statistically sound.

### **Model parameter estimation**

- .14 The actuary would estimate model parameters based on historical market data as opposed to recent market performance. The historical data would cover a period at least twice as long as the projection period. However, when historical data are not available or appropriate for use, adjustments may be required.
- .15 The actuary would update model parameters regularly to reflect recent changes in market conditions.

- .16 When market data for foreign indices are used to estimate model parameters, the foreign exchange rate would be taken into account. The actuary may consider separate parameters for the market index and for the foreign exchange rate, for example, by including an explicit currency exchange model together with using local currency data to estimate the model parameters.
- .17 Parameters would take into account appropriate correlations among investment returns for all market indices and proxies that are constructed.

**Selecting investment return assumptions for specific funds**

- .18 To develop investment returns for a specific fund, an appropriate proxy for the fund would be constructed. The specific fund's investment policy, its asset allocation implied by the fund performance objective, its performance history, and its trading activities would be considered and reflected in the proxy asset composition. The proxy may take the form of a combination of recognized market indices or economic sector sub-indices or, less commonly, a well-defined set of trading rules in a specified asset universe. It would be appropriate for there to be a close relationship between the investment return proxy and the specific funds.

Investment returns would be generated on a gross basis, before the application of any fees or consideration of specific product features. The objective would be to model the investment returns independently of any product features. However, care would be taken to assess whether total or price returns are required for the specific funds being modelled.

**Discount rates**

- .19 Where a discounting approach is used in conjunction with stochastic modelling as an approximation to the Canadian asset liability method, the actuary would select discount rates (or accumulation rates) to determine the asset balance necessary to support the liabilities under a given scenario using the assets allocated at the calculation date to support the liabilities and reflecting in a reasonable manner portfolio yields that would be projected given the insurer's investment policy and hedging practices.

**Base scenario**

- .20 With respect to investment return scenarios, the base scenario for calculating the provision for adverse deviations would be defined as a notional or implicit scenario, which would result in a liability equal to the average of the insurance contract liabilities for all modelled investment return scenarios. This implicit scenario does not need to be explicitly identified or described.

## 2400 The Appointed Actuary

### 2410 Definitions

- .01 In sections 2400 and 2500, “senior management” means
- In the case of a Canadian insurer, the chief executive officer, the chief financial officer, and the chief risk 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

- .01 Part 1000 applies to work within the scope of this section 2400.
- .02 This section 2400 applies 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, that are substantially the same as those of the appointed actuary in the federal Act.
- .03 This section 2400 also applies to an actuary who has the access to information and protection against civil liability equivalent to that which the federal Insurance Companies Act grants to an appointed actuary, even if this actuary is not an appointed actuary.

### 2430 Accepting and continuing an engagement

- .01 Section 1300 applies rigorously to the engagement. [Effective February 1, 2018]

#### Qualifications, experience, and knowledge

- .02 The necessary qualifications, experience, and knowledge for the engagement go beyond technical understanding and include the awareness that comes with maturity, communication 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, but is not limited to
- Files of in-force policies and outstanding claims, including their reinsurance;
  - Policy provisions and other communications with policy owners;
  - Past experience data;
  - Past financial data;
  - Communications with auditors and regulators;
  - Pricing practice;
  - Underwriting practice;
  - Accounting practice;
  - Claims settlement practice (including case estimate practice) and cost;
  - Asset-liability management practice;
  - Capital management practice;
  - Enterprise risk management policy; and
  - Own risk and solvency assessment (ORSA) report.



- .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*.

## 2440 Report on matters requiring rectification

- .01 The appointed actuary should identify and monitor matters that may threaten the insurer's financial condition. The appointed actuary should investigate and then report, as required by law, any such matter that requires rectification to the senior management and, in the case of a Canadian insurer, send a copy of the report to the directors. Depending on the jurisdiction of the insurer, the law may also require that the report be provided to the insurer's regulator. [Effective April 15, 2017]
- .02 The report may include recommendations for rectification and should specify a deadline for rectification that the actuary may later extend if appropriate. If there is no suitable rectification by that deadline or its extension, then the appointed actuary should report the matter to the insurer's regulator. [Effective April 15, 2017]
- .03 The sensitivity of financial condition to adverse conditions and events varies among insurers. Financial condition and hence, the magnitude of the conditions and events that may threaten it, also varies among insurers.
- .04 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.
- .05 There would be no such report to senior management of an adverse condition that does not threaten the insurer's financial condition. Informal notification and consultation would usually precede, and may obviate, that report to senior management.
- .06 That report would describe the threatening condition or event and the assumptions and methods in the actuary's investigation of it. It is desirable that the report includes recommendations for its rectification.
- .07 The deadline would allow time, that is reasonable in the circumstances, to arrange rectification.
- .08 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.

## 2450 Report to the directors

- .01 The appointed actuary for a Canadian insurer should report at least yearly to the directors, or to their audit committee if the directors so delegate,
- On the insurer's financial position and financial condition; and
  - If required by law;
    - If the insurer has one or more participating accounts;
      - On the method of allocation of income and expenses to each such participating account;
      - On the management of the participating account(s), the dividend policy and dividend scales for the participating policy owners; and
    - If the insurer has adjustable policies in force, on the criteria established or amended by the directors for changes made by the company to the premium or charge for insurance, amount of insurance or surrender value in respect of its adjustable policies. [Effective April 15, 2017]
- .02 The appointed actuary for a foreign insurer should report at least yearly to its chief agent for Canada on its financial position and financial condition. [Effective April 15, 2017]

### Allocation of income

- .03 The report on allocation of income and expenses among accounts would consider the fairness and equity of such allocation to participating policy owners.

### Management of the participating account(s)

- .04 The report on the management of the participating account(s) would consider the fairness to participating policy owners of the policy established by the directors respecting the management of the participating account(s).

### Dividend policy and dividend scale

- .05 The report on the dividend policy would consider the fairness of the policy to the participating policy owners. The report on the dividend scale would consider the conformity of the dividend scale to the dividend policy and its fairness to the participating policy owners.

### Adjustments of adjustable policies

- .06 The report on adjustable policies would consider the fairness of the criteria for changes to adjustable policies established or amended by the directors, the fairness to adjustable policy owners of the adjustments made, and their conformity to those criteria.

### **Fairness opinions**

.07 Where the applicable law requires that the appointed actuary opine on the fairness of the policies, criteria, or methods established by the insurer with respect to any of

- Management of the participating accounts;
- Dividend policy;
- Dividends declared;
- Policy established respecting the criteria for making adjustments to adjustable policies and the adjustments made under this policy;
- Allocation of investment income to the participating accounts; and
- Allocation of expenses to the participating accounts;

the wording of an unqualified opinion would be as follows:

#### **Management of participating accounts opinion**

I have reviewed the policy established by the Board of Directors with respect to the management of the participating accounts of [the Company], [including amendments made during the most recent 12 months]. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the policy is fair to the participating policyholders.

Mary F. Roe

Fellow, Canadian Institute of Actuaries

[Place of issue of opinion]

[Date of opinion]

**Dividend policy opinion**

I have reviewed the policy established by the Board of Directors for determining the dividends [and bonuses or other benefits] of [the Company], [including amendments made during the most recent 12 months]. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the policy is fair to the participating policyholders.

Mary F. Roe  
Fellow, Canadian Institute of Actuaries  
[Place of issue of opinion]  
[Date of opinion]

**Dividend declaration opinion**

I have reviewed the proposed dividends [and bonuses or other benefits], determined by the Board of Directors of [the company] with respect to policy years [ending between XX and YY], and have considered whether they have been determined in accordance with the policy established by the Board. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the proposed dividends [and bonuses or other benefits] are in accordance with the policy established by the Board and are fair to the participating policyholders.

Mary F. Roe  
Fellow, Canadian Institute of Actuaries  
[Place of issue of opinion]  
[Date of opinion]

**Adjustable policy changes opinion**

I have reviewed the criteria established by the Board of Directors of [the company] with respect to any changes to be made to the premium or charge for insurance, amount of insurance or surrender value in respect of its adjustable policies [including amendments made during the most recent 12 months] and the changes made pursuant to those criteria. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the criteria are fair to the adjustable policyholders, and the changes made to the adjustable policies during the most recent 12 months are in accordance with those criteria and are fair to the adjustable policyholders.

Mary F. Roe  
Fellow, Canadian Institute of Actuaries  
[Place of issue of opinion]  
[Date of opinion]

**Allocation of investment income to participating account(s) opinion**

I have reviewed the method established by the Board of Directors for determining the portion of the investment income or losses of [the company] for the financial year ending [XX], including capital gains and losses, that is allocable to the participating account [each participating account] maintained by the company. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the method is fair and equitable to the participating policyholders.

Mary F. Roe  
Fellow, Canadian Institute of Actuaries  
[Place of issue of opinion]  
[Date of opinion]

### **Allocation of expenses to participating account(s) opinion**

I have reviewed the method established by the Board of Directors for determining the portion of the expenses, including taxes, of [the company] for the financial year ending [XX] that is allocable to the participating account [each participating account] maintained by the company. I conducted my review in accordance with accepted actuarial practice in Canada and pursuant to the guidance of the Superintendent of Financial Institutions.

In my opinion, the method is fair and equitable to the participating policyholders.

Mary F. Roe

Fellow, Canadian Institute of Actuaries

[Place of issue of opinion]

[Date of opinion]

- .08 If the appointed actuary is unable to issue an unqualified opinion, the wording of the opinion would be adjusted to reflect the necessary qualification.

### **2460 Communication with the auditor**

- .01 Communication with the insurer's auditor would be 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.

### **2470 Certification of capital filings as required by the regulator**

- .01 This subsection 2470 applies to the appointed actuary of a life insurer when giving an opinion on the appropriateness of capital requirement calculations pursuant to law or on the appropriateness of internal models used to determine required capital for segregated fund guarantees pursuant to requirements of the regulator.

- .02 Such certifications should contain an opinion signed by the appointed actuary. [Effective April 15, 2017]

### **Appropriateness of capital requirement calculations**

- .03 The appointed actuary should prepare a report to support the opinion on the appropriateness of capital requirement calculations that outlines the areas where the calculation required discretion or significant technical calculations, and the methods and judgments that were applied. The report should be completed before the provision of a signed opinion pursuant to subsection 2470. [Effective April 15, 2017]

- .04 The opinion would be provided annually in support of the fiscal year-end regulatory capital filing on form(s) as directed by the regulator.
- .05 In providing such an opinion, the actuary would not be 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 Here is the standard opinion language [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 calculations of the components of the required and available capital have been determined in accordance with the regulatory guidelines, and the components of the calculations requiring discretion were determined using method and judgement appropriate to the circumstances of the company.”

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

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

**Appropriateness of internal models used to determine required capital for segregated fund guarantees**

- .07 The appointed actuary should prepare a report to support the opinion on the appropriateness of internal models used to determine required capital for segregated fund guarantees that outlines how the models comply with the related requirements of the regulator. The report should be completed before the provision of a signed opinion pursuant to subsection 2470. [Effective April 15, 2017]

- .08 The opinion would be provided annually in support of the fiscal year-end regulatory capital filing on form(s) as directed by the regulator. The opinion would also be provided to the regulator upon a new application to the regulator for permission to use such a model for required capital purposes and upon request of the regulator when making a modification to an existing model approved by the regulator.
- .09 In providing such an opinion, the actuary would not be opining on whether the underlying factors or specified methods to be followed are appropriate, but rather on the compliance with the requirements of the regulator.
- .10 Here is the standard opinion language [insert appropriate wording where indicated by square brackets].

“I have reviewed the internal model of [company name] for determining required capital for segregated fund guarantee risks as at [date] in the context of the requirements of [the regulator]. In my opinion, the [proposed] model is compliant in all material respects with the requirements of [the regulator] for an approved model used to determine required capital for segregated fund guarantee risks.”



## 2500 Dynamic Capital Adequacy Testing

### 2510 Scope

- .01 Part 1000 applies to work within the scope of this section 2500.
- .02 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 Analysis

- .01 The appointed actuary should make an investigation at least once during each financial year of the insurer's recent and current financial position and financial condition, as revealed by dynamic capital adequacy testing for selected scenarios. [Effective April 15, 2017]
- .02 The appointed 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 its chief agent for Canada. The report should identify possible actions for dealing with any threats to satisfactory financial condition that the investigation reveals. [Effective April 15, 2017]
- .03 The appointed actuary should ensure that the investigation is current. The investigation should take into consideration recent events and recent financial operating results of the insurer. [Effective April 15, 2017]
- .04 The timing and frequency of the appointed actuary's investigations would be sufficient to support timely corrective actions by management and the board of directors or chief agent for Canada.

#### Recent and current financial position

- .05 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

- .06 Dynamic capital adequacy testing examines the effect of selected plausible adverse scenarios on the insurer's forecasted capital adequacy. It would be one of the actuary's primary tools for investigation of an insurer's financial condition.
- .07 The purpose of dynamic capital adequacy testing is to identify plausible threats to satisfactory financial condition, actions that would lessen the likelihood of those threats, and actions that would mitigate a threat if it materialized.

- .08 Dynamic capital adequacy testing is defensive, i.e., it addresses threats to financial condition rather than the exploitation of opportunity.

**Satisfactory financial condition**

- .09 The insurer's financial condition would be satisfactory if throughout the forecast period,
- Under the base scenario, the insurer meets the supervisory target capital requirement; and
  - Under the base scenario and all plausible adverse scenarios, the statement value of the insurer's assets is greater than the statement value of its liabilities.

**Data, methods, and assumptions**

- .10 The actuary would start the forecast period using the data as of the most recent available fiscal year-end statement of financial position date.
- .11 The assumptions and methods would reflect up-to-date studies and analysis available to the actuary.
- .12 The policy liabilities would be revalued at the end of the first financial year of the forecast period if a change in assumptions or method that is expected to be made by the insurer would result in a material change to the financial position of the insurer.
- .13 The actuary would consider recent events and recent operating results of the insurer up to the date of the report. The opening position would be consistent with the most recent year-end financial reporting.
- .14 If an adverse event occurs between the date of the report and the date of its presentation to the insurer's board of directors (or its chief agent for Canada), then the actuary would, at a minimum in the presentation to the insurer's board of directors (or its chief agent for Canada), address the event and its potential implications on the results of the investigation. If appropriate, the actuary would redo the investigation.

**Forecast period**

- .15 The forecast period would begin at the date of the most recent available fiscal year-end statement of financial position. The forecast period for a scenario would be sufficiently long to capture the effect of its adversity and the ability of management to react. The forecast period for a typical life insurer would not be less than five fiscal years. The forecast period for a typical property and casualty insurer would not be less than three fiscal years.

## Scenarios

- .16 The scenarios would 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 or acquired during the forecast period, and both insurance and non-insurance operations (e.g., asset management, banking, or trust company subsidiaries).

### Base scenario

- .17 The base scenario would be a realistic set of assumptions used to forecast the insurer's financial position over the forecast period. Normally, the base scenario would be consistent with the insurer's business plan. The actuary would 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

- .18 An adverse scenario is a scenario with an adverse outcome developed by stress-testing the assumptions used in forecasting the business plan, including the determination of insurance contract liabilities, with regard to risk factors that may trigger potential threats to the insurer's financial condition. An adverse scenario would be characterized as a plausible adverse scenario if it is credible and has a non-trivial probability of occurring. The actuary may use percentile rankings of outcomes to determine whether a scenario is both plausible and adverse. Plausible adverse scenarios vary among insurers and may vary over time for a particular insurer.
- .19 The actuary would consider material, plausible risks or events to the insurer. Reverse stress-testing can help assess whether certain risk factors need to be tested, on the grounds that certain risk factors could never deteriorate to the point where they would be a threat to the insurer's financial condition. The actuary can thereby determine whether a material, plausible risk or event exists for the insurer over the forecast period.

**Risk categories**

- .20 For life insurers, the actuary would consider threats to capital adequacy under plausible adverse scenarios that include, but are not limited to, the risk categories
- Mortality;
  - Morbidity;
  - Persistency and lapse;
  - Interest rate;
  - Inflation;
  - Deterioration of asset values;
  - New business;
  - Expenses;
  - Reinsurance;
  - Government and political issues;
  - Counterparty;
  - Off-balance-sheet items; and
  - Related companies.
- .21 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 risk categories
- Claim frequency and severity;
  - Policy liabilities;
  - Inflation;
  - Premium;
  - Reinsurance;
  - Investment;
  - Government and political issues;
  - Off-balance-sheet items; and
  - Related companies.

### **Integrated scenarios**

- .22 The actuary would construct integrated scenarios by combining two or more risk factors whose combination gives rise to a plausible adverse scenario.
- .23 In developing integrated scenarios, the actuary would consider how risk factors interact. For example, the impact of combining adverse scenarios for two or more risk factors, where each is associated with a relatively high probability, may give rise to an integrated adverse scenario to which the insurer's financial condition is sensitive. In such cases, an integrated scenario would be constructed by combining stress tests related to two or more risk factors. An integrated scenario would be designed so as to itself constitute a plausible adverse scenario.
- .24 An integrated scenario would be included in the minimum of three plausible adverse scenarios required by paragraph 2520.32 if the integrated scenario was found to be one of the three most adverse scenarios.

### **Ripple effects**

- .25 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.
- .26 Ripple effects would include both policy owner action and the insurer's expected response to adversity. Selection of the assumptions for the insurer's response would, where appropriate, take into account
- Effectiveness of the insurer's management information systems and adjustment mechanisms;
  - Insurer's historical record of promptness and willingness, when faced with adversity, to make difficult decisions; and
  - External environment assumed in the scenario.
- .27 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.
- .28 Ripple effects also include regulatory action, especially under any plausible adverse scenario where the insurer fails to meet the supervisory target 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.

### **Corrective management actions**

- .29 For each of the plausible adverse scenarios that would result in a threat to satisfactory financial condition, the actuary would identify possible corrective management actions that would lessen the likelihood of that threat, or that would mitigate that threat, if it materialized. These actions could include but are not limited to
- Repricing the insurance products;
  - Suspending dividend payments, capital reductions, and transfers to the parent or home office, where applicable;
  - Raising additional capital or adopting an approved plan to raise additional capital if and when needed within a reasonable timeframe, or, in the case of a branch, requesting transfer of adequate funds from the parent company;
  - Strengthening risk management practices;
  - Mitigating the risk causing the capital shortfall; and
  - An increased level of monitoring and reporting with respect to the insurer's capital position.
- .30 Consideration would also be given to the effectiveness of planned management actions in a volatile or stressed environment.

### **Scope of the investigation and report**

- .31 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.
- .32 The report would disclose each of the risk categories considered in undertaking the dynamic capital adequacy testing analysis, including those identified in these Standards of Practice. It is expected that the actuary would scenario test and report at least once during each financial year on the base scenario, and a minimum of three plausible adverse scenarios posing the greatest risk for the insurer. Fewer than three plausible adverse scenarios may be reported only in the rare event that it is not possible to develop such scenarios.
- .33 The report would also contain the plausible adverse scenarios examined that cause the insurer to fall below the supervisory target capital requirement. 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.

- .34 If the investigation identifies any plausible threat to satisfactory financial condition, then the actuary would identify possible corrective management action that would lessen the likelihood of that threat, or that would mitigate that threat, if it materialized. For each such adverse scenario reported upon, the actuary would report the results both with and without the effect of corrective management action. The actuary would ensure that the disclosure of the corrective management action was sufficiently clear so that users may consider its practicality and adequacy.
- .35 The report would present the financial position of the insurer at each fiscal year-end throughout the forecast period.

#### **Revaluation of the policy liabilities**

- .36 Ideally, for the base and each plausible adverse scenario, the insurance contract liabilities and, if applicable, other policy liabilities or reinsurance recoverables, 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.

#### **Frequency and/or timing**

- .37 The frequency and/or timing of the report would depend on the urgency of the matters being reported and on the desirability of integrating dynamic capital adequacy testing into the insurer's financial planning cycle.
- .38 The frequency and/or timing of the actuary's investigation would be adjusted where an adverse change in the insurer's circumstances since the last investigation may be so significant that to delay reporting to the time of the next scheduled investigation would be imprudent. For example, failure to meet the supervisory target capital requirement, or adoption of a radically different business plan, may necessitate the preparation of an immediate report.

### **2530 Reporting**

- .01 In the case of a Canadian insurer, the appointed actuary should 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 appointed actuary should report to the chief agent for Canada and may also report to the responsible senior executive in the parent head office. [Effective April 15, 2017]
- .02 In order to give the insurer's senior management an opportunity to react to the results of the investigation, the actuary would 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 would be more useful than a statistical report.
- .04 The report would be submitted within 12 months following each fiscal year-end.

### 2540 Opinion by the actuary

.01 The report should contain an opinion signed by the appointed actuary. [Effective April 15, 2017]

- .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 investigation of the [future] financial condition of [insurer name] as at [date] in accordance with accepted actuarial practice in Canada.

I have analyzed the forecasted financial positions of the insurer during the [number] year forecast period under a series of scenarios. A description of these scenarios and their impact on the insurer is included within this report.

The most significant assumptions are described within this report. The investigation 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.

My report includes the identification of key risk exposures [and corrective management actions that could be taken to mitigate the effect of plausible adverse scenarios].

In my opinion, the [future] financial condition of the insurer [is satisfactory or is not satisfactory for the following reason(s)...]”

[Montréal, Québec]  
[Report date]

[Mary F. Roe]  
Fellow, Canadian Institute of Actuaries



## 2600 Ratemaking: Property and Casualty Insurance

### 2610 Scope

- .01 Part 1000 applies to work within the scope of this section 2600.
- .02 This section 2600 applies to the derivation of indicated rates for an insurance contract of property and casualty insurance written by an insurer, a reciprocal insurance exchange, or an underwriting syndicate.
- .03 This section 2600 does not apply to the derivation of indicated rates for public personal injury compensation plans covered by the Practice-Specific Standards for Public Personal Injury Compensation Plans.
- .04 This section 2600 applies to the derivation of indicated rates for any entity, such as a residual market mechanism or an advisory organization, which derives indicated rates for an insurance contract to be written by an insurer, regardless of whether or not that entity is itself an insurer.
- .05 This section 2600 applies to the derivation of indicated rates, but not to the recommendation or selection of rates to be charged. The recommended or selected rates may reflect considerations beyond those set forth in this section 2600.
- .06 This section 2600 also applies to the derivation of indicated rates for insurance risks accepted by a property and casualty quasi-insurer, similar to insurance risks accepted under an insurance contract. In this section 2600, “property and casualty quasi-insurer” means an entity that assumes insurance risks that a property and casualty insurer may assume, without having the legal form of an insurer. Examples of property and casualty quasi-insurers include
- Federal or provincial crown corporations or agencies acting in a capacity similar to a property and casualty insurer;
  - Providers of extended warranties; and
  - Self-funding mechanisms, such as those created by members of a professional association, or entities that retain some or all of their property and casualty insurance risk.

## 2620 Method

- .01 The best estimate present value of cash flows relating to the revenue at the indicated rate should equal the best estimate present value of cash flows relating to the corresponding claim costs and expense costs, plus the present value of a provision for profit, over a specified period of time. [Effective April 15, 2017]
- .02 The actuary should select appropriate methods, techniques, and assumptions recognizing that such elements depend on the circumstances affecting the work and that a variety of actuarial methods may be appropriate to derive an indicated rate. [Effective February 1, 2018]

### Data

- .03 The actuary would consider the availability and relevance of subject experience and related experience.

### Credibility

- .04 The actuary would consider the blending of information from subject experience with information from one or more sets of related experience to improve the predictive value of estimates.

### Changes in circumstances

- .05 The actuary would consider that the subject experience, related experience, and future cash flows may be affected by changes in circumstances that may affect expected claim costs, expense costs, and provision for profit.

.06 Relevant circumstances subject to change may include items that are largely under the control of the entity providing insurance, such as

- Underwriting practice;
- Distribution system;
- Claims handling and case estimate setting practice;
- Reinsurance arrangements;
- Data processing and accounting systems;
- Distribution or type of business written;
- Provisions of the insurance contract(s), when not legislated;
- Premium rates; and
- Rating variables;

as well as items that are largely not under the control of the entity providing insurance, such as

- Legislated coverage or benefits; and
- The economic, social, and legal environments.

#### **Development**

.07 The actuary would consider that subject experience and related experience may be subject to development over time.

#### **Trend**

.08 The actuary would consider that subject experience and related experience may be subject to trend over time.

#### **Unusual events**

.09 The actuary would consider that subject experience and related experience may or may not have been subject to catastrophes, large losses, or other unusual events.

#### **Provision for expense costs**

.10 The actuary would determine the provision for expense costs that is appropriate for the period during which the rates are expected to be in effect.

- .11 In selecting a provision for expense costs, the actuary would consider
- The various categories of expense costs that are incurred including, as may be applicable, residual market assessments, statutory assessments, policyholder dividends, and reinsurance costs;
  - That expense costs may not be directly proportional to premium; and
  - That one-time expense costs may need to be amortized.
- .12 The provision for expense costs, or other assumptions that are pertinent to its derivation, may be specified to the actuary under the terms of an appropriate engagement.

**Provision for profit**

- .13 An indicated rate would include a provision for profit.
- .14 The provision for profit, or other assumptions that are pertinent to its derivation, may be specified to the actuary under the terms of an appropriate engagement.

**Time value of money**

- .15 The investment return rate for calculating the present value of cash flows would reflect the expected investment income to be earned on assets that might be acquired with the net cash flows resulting from the revenue at the indicated rate.
- .16 Among various possible sets of such assets the actuary would consider
- Risk-free assets of appropriate duration;
  - Fixed-income assets of appropriate duration; and
  - Assets which are expected to be acquired.
- .17 The actuary would consider the fact that the provision for profit is not independent of the selected investment return rate and its associated uncertainty.

## 2630 Reporting

- .01 If an external user report is required and the actuary can report without reservation, the actuary's report should include the standard reporting language consisting of the following scope paragraph,

I have derived the indicated rate(s) in accordance with accepted actuarial practice in Canada, on behalf of [entity commissioning the work], for the following insurance category(ies): [name of insurance category(ies)], to be effective Month XX, 20XX for new business and Month XX, 20XX for renewal business. [Effective February 1, 2018]

- .02 If an external user report is required and the actuary cannot report without reservation, the actuary should modify the standard reporting language accordingly. [Effective February 1, 2018]

- .03 An additional opinion paragraph may be included to conform to the requirements of an external user.

## 2700 Policyholder Dividend Determination

### 2710 Scope

- .01 Part 1000 applies to work within the scope of this section 2700.
- .02 Section 2700 applies to advice provided on policyholder dividend determination on individual life, annuity, and health policies.

### 2720 Report on policyholder dividends

- .01 There should be a written report which documents the advice on policyholder dividend determination, and which describes the framework of facts, assumptions, and procedures upon which the advice was based. [Effective April 15, 2017]
- .02 The report should include
  - A description of the process used to determine dividends;
  - The manner in which policy and experience characteristics are reflected in that process; and
  - The methodology used to calculate dividends, including specific factors used to reflect policy and experience characteristics. [Effective April 15, 2017]
- .03 The report should state whether or not the contribution principle has been followed, and, if it has not been followed, the report should describe any deviations and their rationale. [Effective April 15, 2017]

## **3000 – Pension Plans**

## Table of Contents

<b>3100</b>	<b>Scope .....</b>	<b>3003</b>
<b>3200</b>	<b>Advice on the Funded Status or Funding of a Pension Plan.....</b>	<b>3004</b>
3210	General .....	3004
3220	Types of Valuations .....	3007
3230	Going Concern Valuation .....	3008
3240	Hypothetical Wind-up Valuation.....	3009
3250	Solvency Valuation .....	3012
3255	Other Valuations .....	3012
3260	Reporting: External User Report .....	3013
<b>3300</b>	<b>Full or Partial Wind-up Valuation.....</b>	<b>3021</b>
3310	General .....	3021
3320	Assumptions.....	3022
3330	Reporting: External User Report .....	3023
<b>3400</b>	<b>Financial Reporting Of Pension Costs .....</b>	<b>3031</b>
3410	General .....	3031
3420	Reporting: External User Report .....	3032
<b>3500</b>	<b>Pension Commuted Values .....</b>	<b>3034</b>
3510	Scope .....	3034
3520	Method.....	3035
3530	Demographic Assumptions .....	3037
3540	Economic Assumptions .....	3038
3550	Disclosure .....	3042
3560	Reduced Life Expectancy.....	3043



## 3100 Scope

- .00 Part 1000 applies to work within the scope of this part 3000.
- .01 The standards in part 3000 apply as follows:
- Section 3200 applies to advice that an actuary provides regarding the funded status or funding of a pension plan, except where such advice is with respect to:
    - The wind-up, in full or in part, of a pension plan; or
    - The financial reporting of a pension plan's costs and obligations in the employer's or the pension plan's financial statements;
  - Section 3300 applies to advice that an actuary provides on the funded status or funding with respect to the wind-up, in full or in part, of a pension plan;
  - Section 3400 applies to advice that an actuary provides with respect to financial reporting of a pension plan's costs and obligations in the employer's or the pension plan's financial statements; and
  - Section 3500 applies to advice that an actuary provides regarding the computation of commuted values in the circumstances described in subsection 3510.

The wind-up of a pension plan involves the settlement of plan benefits and distribution of all plan assets. The cessation of benefit accruals or termination of a plan, not involving the settlement of plan benefits and distribution of plan assets, would not constitute a plan wind-up.

- .02 The standards in sections 3200 through 3400 apply to advice with respect to a pension plan, including any arrangement that provides retirement income to its members, whether funded or not, whether registered or not, and whether in the private or public sector, except for:
- A defined contribution pension plan (noting that the standards do apply, however, to any pension plan that is a hybrid of a defined contribution pension plan and a defined benefit pension plan);
  - A pension plan whose benefits are all guaranteed by a life insurer; and
  - Social security programs such as the Canada Pension Plan, Québec Pension Plan, and the pension provided by the federal Old Age Security Act.

## 3200 Advice on the Funded Status or Funding of a Pension Plan

- .01 This section 3200 applies to advice that an actuary provides regarding the funded status or funding of a pension plan, except where such advice is with respect to:
- The wind-up, in full or in part, of a pension plan; or
  - The financial reporting of a pension plan's costs and obligations in the employer's or the pension plan's financial statements.

### 3210 General

- .01 The actuary's advice on the funded status or funding of a pension plan should take account of the circumstances of the work. [Effective December 31, 2010]
- .02 The actuary should select an actuarial cost method that is consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .03 The actuary should select an asset valuation method that is consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .04 The actuary's advice on the funded status of a pension plan should take account of the pension plan's benefits at the calculation date, except that the actuary's advice may anticipate a pending amendment to the pension plan that increases the value of its benefits. [Effective December 31, 2010]
- .05 The actuary's advice on the funded status or funding of a pension plan should take account of expenses if they are expected to be paid from the pension plan's assets. [Effective December 31, 2010]
- .06 The actuary's advice on the funded status or funding of a pension plan may, consistent with the circumstances affecting the work, take into account the value and the terms of a letter of credit of which the pension plan is the beneficiary. [Effective February 1, 2018]
- .07 If the actuary is providing advice on funding:
- The actuary should determine the next calculation date, and
  - The actuary's advice on funding should cover at least the period between the calculation date and the next calculation date. [Effective December 31, 2010]

**Circumstances affecting the work**

- .08 For the purposes of section 3200, the circumstances affecting the work would include:
- Whether the actuary's advice relates to the funded status or the funding of the pension plan, or a combination thereof;
  - The terms of the appropriate engagement under which the work is being performed; and
  - The application of the law to the work.
- .09 In the case of a pension plan registered under the Income Tax Act (Canada), the actuary would be familiar with guidance with respect to the funding of pension plans that has been published by an applicable regulatory authority.
- .10 Advice on funding would include:
- A valuation to establish the amount of a letter of credit to secure the payment of pension plan benefits;
  - Advice regarding an amount of assets to be earmarked, but not segregated, to a trust fund, to cover pension benefit commitments; and
  - Advice on the funding implications of a plan amendment.
- .11 The terms of an appropriate engagement may specify applicable objectives of funding, which may include a formal or informal funding policy. For example, the terms of an appropriate engagement for a pension plan registered under the Income Tax Act (Canada):
- May be limited to preparation of an external user report on the basis of applicable law including the minimum contributions required by law;
  - May require the preparation of an external user report recommending contributions reflecting objectives of funding specified by the plan sponsor or plan administrator, as applicable, in addition to the requirements of law; and
  - Where contributions are fixed, may require the preparation of an external user report reflecting objectives of funding specified by the plan administrator or other appropriate authority, as applicable in addition to the requirements of law.
- .12 The terms of an appropriate engagement may specify the use of a particular actuarial cost method and/or a particular asset valuation method, consistent with these standards.

- .13 Objectives of funding specified by the terms of an appropriate engagement may include considerations such as the security of benefits and related provisions for adverse deviations, the orderly and rational allocation of contributions among time periods, and/or inter-generational equity.
- .14 Depending on the circumstances affecting the work, the actuary's advice on funding may describe a range of contributions.

#### **Actuarial cost methods**

- .15 Actuarial cost methods include:
- Cost allocation methods, which allocate the actuarial present value of projected benefits among time periods, including 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 a portion of the actuarial present value of projected benefits to a time period as a function of the change in accrued or projected benefits during the period, including the accrued benefit actuarial cost method, the unit credit actuarial cost method and the projected unit credit actuarial cost method; and
  - Forecast actuarial cost methods, which allocate a portion of the actuarial present value of projected benefits to the forecast period based on:
    - The actuarial present value, at the calculation date, of projected benefits at the end of the forecast period including, if appropriate, benefits for those who are expected to become members between the calculation date and the end of the forecast period;minus
    - The actuarial present value of projected benefits at the calculation date;plus
    - The actuarial present value, at the calculation date, of benefits expected to be paid during the forecast period.
- .16 When using a forecast actuarial cost method, the beginning and ending actuarial present value of projected benefits may be calculated from the perspective of either a hypothetical wind-up valuation or a going concern valuation.

#### **Asset valuation methods**

- .17 The use of an asset valuation method that produces an asset value different from market value may be appropriate depending on the circumstances affecting the work. For example, the use of a smoothed asset value may be appropriate to moderate the volatility of contribution rates for purposes of advice on funding.

- .18 The value of assets may be, subject to specific requirements for different types of valuation, any of:
- Their market value;
  - Their market value adjusted to moderate volatility in investment returns;
  - 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.

**Deferred recognition of pending amendment**

- .19 If, at the calculation date, an amendment to the pension plan is definitive or virtually definitive:
- 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 the effective date may disregard the amendment, unless otherwise required by law, but the advice on funding after the effective date would take the amendment into account; or
  - If the effective date of the amendment is after the period for which the report gives advice on funding, then the advice on funding may disregard the amendment unless otherwise required by law.

- .20 The 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 either definitive or virtually definitive.

**Next calculation date**

- .21 The next calculation date is the latest date for which the actuary considers the advice on funding to be applicable. The actuary would take into consideration the law and the terms of an appropriate engagement in determining the next calculation date.

**3220 Types of Valuations**

- .01 When giving advice on the funded status or funding of a pension plan, the actuary should undertake one or more types of valuations that are consistent with the circumstances affecting the work. [Effective February 1, 2018]

### Types of valuations

- .02 There are different types of valuations that an actuary may undertake when giving advice on the funded status or funding of a continuing pension plan, the most common of which are:
- A going concern valuation;
  - A hypothetical wind-up valuation; and
  - A solvency valuation.

### 3230 Going Concern Valuation

- .01 For a going concern valuation the actuary should:
- Assume that the plan continues indefinitely;
  - Select either best estimate assumptions or best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, required by law or by the terms of an appropriate engagement; and
  - Consider all benefits of which the actuary is aware, including contingent benefits, payable under the pension plan and should include provision for all such benefits expected to be paid while the plan is ongoing unless:
    - The law requires the valuation to exclude such benefits; or
    - The law permits the exclusion of such benefits and the terms of an appropriate engagement stipulate that the actuary exclude such benefits. [Effective February 1, 2018]

### Assumptions

- .02 For pension plans that are funded, in selecting the best estimate assumption for the discount rate, the actuary may either:
- Take into account the expected investment return on the assets of the pension plan at the calculation date and the expected investment policy after that date; or
  - Reflect the yields on fixed income investments, considering the expected future benefit payments of the pension plan and the circumstances affecting the work.
- .03 In establishing the discount rate assumption, the actuary would assume that there will be no additional returns achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy except to the extent that the actuary has reason to believe, based on relevant supporting data, that such additional returns will be consistently and reliably earned over the long term.

- .04 If the plan is a “designated plan” as that term is defined in the Income Tax Regulations (Canada) and the purpose of the going concern valuation is to determine the maximum funding permitted by law, then the actuary would use assumptions stipulated by law for that purpose.

**Contingent benefits**

- .05 An example of a contingent benefit relevant to a going concern valuation is a provision granting the employer or plan administrator the right to waive early retirement reductions to members retiring from active employment. In making provision for such a contingent benefit, the actuary would consider past experience, current circumstances and future expectations relating to the employer’s or plan administrator’s granting of such benefits.

**Benefits stipulated by law**

- .06 If the plan is a “designated plan”, as that term is defined in the Income Tax Regulations (Canada), and the purpose of the going concern valuation is to determine the maximum funding permitted by law, then the actuary would reflect the benefits stipulated by law for that purpose.

**3240 Hypothetical Wind-up Valuation**

- .01 A hypothetical wind-up valuation determines the funded status of a pension plan on the assumption that the plan is wound up at the calculation date. The standards for a full wind-up valuation in section 3300 apply to a hypothetical wind-up valuation except for the external user report requirements therein and as superseded by the following recommendations. [Effective September 18, 2013]
- .02 For a hypothetical wind-up valuation, the actuary should determine benefit entitlements on the assumption that the pension plan has neither a surplus nor a deficit. [Effective September 18, 2013]
- .03 In determining the benefit entitlements, the actuary should postulate a scenario upon which the hypothetical wind-up valuation is based, taking account of the circumstances affecting the work. [Effective February 1, 2018]
- .04 The actuary should take account of contingent benefits that would be payable under the postulated scenario for the hypothetical wind-up. [Effective September 18, 2013]
- .05 For a hypothetical wind-up valuation, the actuary may assume that the wind-up date, the calculation date and the settlement date are coincident. [Effective September 18, 2013]

- .05.1 For a hypothetical wind-up valuation, the actuary may assume that benefits would be settled by the purchase of annuities regardless of any limitation of capacity in the market for group annuity contracts. [Effective September 18, 2013]
- .06 For a hypothetical wind-up valuation, the value of assets should be the market value of assets. [Effective September 18, 2013]
- .07 For a hypothetical wind-up valuation, the actuary should select an explicit assumption for expenses expected to be payable from the pension plan's assets to wind up the pension plan. [Effective September 18, 2013]

#### **Membership data**

- .08 The precision of the membership data is less critical for a hypothetical wind-up valuation than for an actual wind-up valuation.
- .09 Since an actual wind-up is not occurring, pertinent membership data may not be available. The actuary would make appropriate assumptions regarding such missing membership data. For example, it may be appropriate to retroject current earnings based on aggregate historical pay increases in order to estimate final average earnings.

#### **Postulation of scenarios**

- .10 There are often multiple scenarios regarding the circumstances that may result in the wind-up of a pension plan. For a hypothetical wind-up valuation, the actuary may postulate any reasonable, internally consistent, scenario regarding the circumstances resulting in the wind-up of a pension plan, consistent with the circumstances affecting the work. For the postulated scenario, the actuary would reflect the treatment of any contingent benefits, including:
- Those that are contingent upon the wind-up scenario, such as a plant closure benefit; or
  - Those that are required by law, such as a provision for earlier commencement of deferred pension entitlements in the event of plan wind-up; and
  - Those that are contingent upon a factor other than the wind-up scenario.
- .11 Examples of contingent benefits that are dependent upon factors other than the wind-up scenario or as required by law are:
- A provision granting the employer or plan administrator the discretion to waive early retirement reductions; and
  - A provision providing enhanced benefits if funds are sufficient.



### **Subsequent events**

- .12 The actuary may reflect subsequent events in the valuation provided that doing so either increases the actuarial present value of the projected benefits at the calculation date or reduces the value of the pension plan's assets at the calculation date.

### **Wind-up expenses**

- .13 Since the actuary would assume that the pension plan has neither a surplus nor a deficit, wind-up expenses related to the resolution of surplus or deficit issues need not be considered.
- .14 In developing the assumption for expenses expected to be payable from the pension plan's assets to wind up the pension plan, the actuary would also make an assumption as to the solvency of the employer. The assumption with respect to the payment of expenses and the assumption with respect to the solvency of the employer would be consistent.

### **Settlement Methods**

- .15 A hypothetical wind-up valuation requires the actuary to select assumptions about the methods of settlement.
- .16 The actuary may assume a settlement method permitted by law or any relevant regulatory policy or guideline.
- .17 The actuary may assume settlement by means of a replicating investment portfolio if permitted by law or any regulatory policy or guideline, or where it is anticipated that annuities could not be purchased due to group annuity capacity limitations. The assumed replicating portfolio would provide for an appropriate level of security for the pension benefits covered.
- .18 The actuary may incorporate assumptions as to the exercise of regulatory discretion, a change in law, or a plan amendment which would be required to enable a practical settlement of benefits. When making such assumptions, the actuary would consider any relevant regulatory policy, guidance, or precedent.
- .19 For example, for a plan where pensions are indexed with the Consumer Price Index and where it is impractical to purchase annuities indexed with the Consumer Price Index, the actuary may assume that annuities would be purchased with indexing at a fixed percentage rate of comparable value to indexing in accordance with the plan provisions.

### 3250 Solvency Valuation

- .01 A solvency valuation typically is a form of a hypothetical wind-up valuation required by law and the actuary should apply the standards for a hypothetical wind-up valuation unless:
- Otherwise required by law; or
  - Otherwise permitted by law and stipulated by the terms of an appropriate engagement. [Effective December 31, 2010]
- .02 Examples of exceptions permitted by law for the preparation of a solvency valuation under the law of certain jurisdictions include:
- Use of a value of assets other than market value;
  - Use of one or more assumptions that are not best estimate assumptions; or
  - Exclusion of certain benefits from the valuation.

### 3255 Other Valuations

- .01 For a valuation that is not a going concern valuation, a hypothetical wind-up valuation, or a solvency valuation, the actuary should select actuarial methods and actuarial assumptions that are consistent with the terms of an appropriate engagement. [Effective December 30, 2012]
- .02 To the extent that a valuation is not a going concern valuation, hypothetical wind-up valuation, or solvency valuation, but has characteristics similar to one or more of these types of valuations, the actuary would consider any relevant standards for these types of valuations in undertaking the work.
- .03 For example, a valuation for determining the required amount of a letter of credit for a supplemental plan is typically similar to a hypothetical wind-up valuation, but with the actuarial methods and actuarial assumptions stipulated by the terms of the engagement. In such circumstances, the actuary would consider the relevant standards for hypothetical wind-up valuations in undertaking the work.

### 3260 Reporting: External User Report

- .01 An external user report on work pursuant to section 3200 should:
- Include the calculation date, the report date, and the next calculation date;
  - Describe the sources of membership data, plan provisions, and the pension plan's assets, and the dates at which they were compiled;
  - Describe the membership data and any limitations thereof;
  - Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
  - Describe the assets, including their market value and a summary of the assets by major category;
  - Describe the pension plan's provisions, including the identification of any pending definitive or virtually definitive amendment;
  - Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
  - State the type of each valuation undertaken under the terms of the appropriate engagement; and
  - Describe any significant terms of the appropriate engagement that are material to the actuary's advice. [Effective February 1, 2018]

- .02 For each going concern valuation undertaken by the actuary, the external user report should:
- Describe the rationale for any assumed additional returns, net of investment management expenses, from an active investment management strategy as compared to a passive investment management strategy, included in the discount rate assumption;
  - Report the funded status at the calculation date and the service cost or the rule for calculating the service cost between the calculation date and the next calculation date;
  - Disclose any pending but definitive or virtually definitive amendment of which the actuary is aware, and whether or not such amendment has been included in determining the funded status and the service cost;
  - Describe any contingent benefits provided under the pension plan and the extent to which such contingent benefits are included or excluded in determining the funded status and the service cost;
  - Describe any benefits that are not contingent benefits and that have been excluded in determining the funded status and the service cost; and
  - If there is no provision for adverse deviations, include a statement to that effect. [Effective March 31, 2015]
- .03 If an external user report includes one or more going concern valuations then the external user report should, for at least one such valuation included in the report, describe and quantify the gains and losses between the prior calculation date and the calculation date. [Effective December 30, 2012]
- .04 If an external user report includes one or more going concern valuations, other than a valuation for the purpose of determining the maximum funding permitted by law for a “designated plan”, as that term is defined in the Income Tax Regulations (Canada), then the external user report should, for at least one such valuation included in the report, report the effect of using a discount rate 1.0% lower than that used for the valuation on:
- The actuarial present value, at the calculation date, of projected benefits allocated to periods up to the calculation date; and
  - The service cost or the rule for calculating the service cost between the calculation date and the next calculation date. [Effective February 1, 2018]

- .05 For each hypothetical wind-up valuation and solvency valuation undertaken by the actuary, the external user report should:
- Describe the basis for inclusion and the amount considered in respect of a letter of credit of which the pension plan is the beneficiary;
  - Report the funded status at the calculation date;
  - Include a description of the postulated scenario; and
  - Include a description of the extent to which contingent benefits provided under the pension plan are included or excluded in determining the funded status. [Effective March 31, 2015]
- .06 If an external user report includes one or more hypothetical wind-up valuations or solvency valuations then, for any one such hypothetical wind-up valuation or solvency valuation, the external user report should:
- Report the incremental cost between the calculation date and the next calculation date, in respect of the defined benefit portion of the plan;
  - If the external user report does not include a going concern valuation, report the incremental cost between the calculation date and the next calculation date in respect of the defined contribution portion of the plan;
  - Report the effect on the hypothetical wind-up or solvency liabilities, at the calculation date, of using a discount rate 1.0% lower than that used for the valuation; and
  - If the external user report does not include a going concern valuation, describe and quantify the gains and losses between the prior calculation date and the calculation date;
- unless
- The pension plan is a “designated plan” which has, as members, only persons “connected” with the employer as those terms are defined in the Income Tax Regulations (Canada); or
  - The hypothetical wind-up valuation or solvency valuation is based on an extrapolation of results disclosed in a previous external user report. [Effective March 31, 2015]
- .06.1 For each valuation that is not a going concern valuation, a hypothetical wind-up valuation, or a solvency valuation, the external user report should:
- Include a description of the extent to which contingent benefits provided under the pension plan are included or excluded. [Effective March 31, 2015]

- .07 An external user report that provides advice on funding should:
- Describe the determination of contributions or a range of contributions between the calculation date and the next calculation date;
  - If contributions are fixed by the terms of the plan or other governing documents, then either:
    - Report that the contributions are adequate to fund the pension plan in accordance with the law; or
    - Report that the contributions are not adequate to fund the pension plan in accordance with the law; and
      - Describe the contributions required to fund the pension plan adequately in accordance with the law;
      - Describe one or more possible ways in which benefits may be reduced such that the contributions would be adequate to fund the pension plan in accordance with the law; or
      - Describe a combination of increases in contributions and reductions in benefits that would result in the funding being adequate to conform to the law. [Effective December 30, 2012]
- .08 An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:
- A statement regarding membership data, which should usually be, “In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
  - A statement as to assumptions, which should usually be, “In my opinion, the assumptions are appropriate for the purpose(s) of the valuation(s).”;
  - A statement as to methods, which should usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose(s) of the valuation(s).”; and
  - A statement as to conformity, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.” [Effective December 30, 2012]
- .09 An external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the valuation. [Effective December 30, 2012]

### Membership data

- .10 Any assumptions and methods used in respect of insufficient or unreliable membership data would be described.
- .11 The actuary may describe limitations on the tests conducted in the review of the data which has been determined to be sufficient and reliable for purposes of the valuation(s). For example, the actuary may describe that the data tests will not capture all possible deficiencies in the data and reliance is also placed on the certification of the plan administrator as to the quality of the data.

### Types of valuations

- .12 The external user report may provide information with respect to multiple valuations, but would, as a minimum:

- If the pension plan is a registered pension plan and is not a “designated plan”, as that term is defined in the Income Tax Regulations (Canada), provide information with respect to:
  - A going concern valuation, if mandated by law or specified by the terms of an appropriate engagement;
  - A hypothetical wind-up valuation under the scenario regarding the circumstances resulting in the wind-up that, subject to paragraph 3260.19, maximizes the wind-up liabilities, unless the pension plan and the law do not define the benefits payable upon wind-up; and
  - Any other hypothetical wind-up or solvency valuation mandated by law;
- If the pension plan is a “designated plan” as that term is defined in the Income Tax Regulations (Canada), provide information with respect to:
  - A going concern valuation, if mandated by law or specified by the terms of an appropriate engagement;
  - A hypothetical wind-up valuation under the scenario regarding the circumstances resulting in the wind-up that, subject to paragraph 3260.19, maximizes the wind-up liabilities, unless the pension plan and the law do not define the benefits payable upon wind-up or the plan has, as members, only persons “connected” with the employer as that term is defined in the Income Tax Regulations (Canada); and
  - Any other hypothetical wind-up or solvency valuation mandated by law;

and

- If the pension plan is not a registered pension plan, include information with respect to the types of valuations required by the circumstances affecting the work.

### **Significant terms of appropriate engagement**

- .13 Significant terms of the appropriate engagement may include matters like:
- The use of a specified actuarial cost method;
  - The use of a specified asset valuation method;
  - The exclusion of benefits for purposes of a valuation, as permitted by law;
  - The extent of margins for adverse deviations, if any, to be included in selecting assumptions;
  - A policy to fund only the minimum contributions required by law; and
  - Specified methodology for the determination of contribution requirements in excess of the requirements of law.

### **Service cost**

- .13.1 For a plan that is a hybrid of a defined contribution pension plan and a defined benefit pension plan, the service cost for a going concern valuation would include the service cost in respect of both the defined contribution portion of the plan and the defined benefit portion of the plan.

### **Reporting gains and losses**

- .14 The reported gains and losses for a going concern valuation would include the gain or loss due to a change in the actuarial cost method or a change in the method for valuing the assets and each significant change in assumptions and plan provisions determined at the calculation date. If an amendment to the pension plan prompts the actuary to change the assumptions, the actuary may report the combined effect of the amendment and the resultant change in assumptions.

### **Discount rate sensitivity**

- .15 When following the recommendations to illustrate the effect of a change in discount rate on a valuation, the actuary would maintain all other assumptions and methods as used in the underlying valuation.

### **Incremental cost**

- .15.1 The incremental cost for a hypothetical wind-up valuation or a solvency valuation represents the present value, at the calculation date, of the expected aggregate change in the hypothetical wind-up liability or solvency liability between the calculation date and the next calculation date, increased for expected benefit payments between the calculation date and the next calculation date.



### Methods

- .16 For each valuation included in the external user report for which there was a prior valuation, the description of the actuarial cost method would include a description of any change to the actuarial cost method used in the prior valuation and the rationale for such change.
- .17 For each valuation included in the external user report for which there was a prior valuation, the description of the method to value the assets would include a description of any differences in change to the asset valuation method used in the prior valuation and the rationale for such change.

### Assumptions

- .18 For each valuation included in the external user report for which there was a prior valuation, the description of assumptions would include a description of each change to the assumptions from the assumptions used in the prior valuation.
- .18.1 When describing the assumptions for methods of settlement for a hypothetical wind-up or solvency valuation, the actuary would describe any related limitations. For example:
- If the settlement method assumes that annuities would be purchased but it might not be possible to purchase annuities on actual wind-up of the plan due to capacity limitations; or
  - If the settlement method assumes the exercise of regulatory discretion, a change in law, or a plan amendment for which there is no specific authority.

### Scenario that maximizes wind-up liabilities

- .19 In reporting the funded status of the pension plan under the scenario regarding the circumstances resulting in the wind-up that maximizes the wind-up liabilities, the actuary would include benefits that are contingent upon the scenario regarding the circumstances resulting in the wind-up or mandated by law. However, the actuary may disregard:
- Benefits that are contingent upon a factor other than the scenario regarding the circumstances resulting in the wind-up or as mandated by law; and
  - Possible plan member earnings after the calculation date.

### Other types of valuations

- .19.1 Valuations that are not going concern valuations, hypothetical wind-up valuations, or solvency valuations are usually similar in nature to one of these three types of common valuations. In preparing the external user report for such a valuation, the actuary would consider the relevant reporting requirements for a type of valuation similar to the valuation undertaken and would include additional disclosures as appropriate.

**Statements of opinion**

- .20 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.
- .21 While a separate statement regarding assumptions would generally be included in respect of each purpose of the valuation, the statements regarding assumptions may be combined where the statements do not differ among some or all of the valuation's purposes. The report would indicate clearly which statement regarding assumptions applies to each of the valuation's purposes.
- .22 While a separate statement regarding methods would generally be included in respect of each purpose of the valuation, the statements regarding methods may be combined where the statements do not differ among some or all of the valuation's purposes. The report would indicate clearly which statement regarding methods applies to each of the valuation's purposes.

## 3300 Full or Partial Wind-up Valuation

- .01 This section 3300 applies to advice that an actuary provides on the funded status or funding with respect to the wind-up, in full or in part, of a pension plan.

### 3310 General

- .01 The actuary's advice with respect to a pension plan that is being wound-up, in full or in part, should take account of the circumstances affecting the work. [Effective February 1, 2018]
- .02 The actuary should take account of subsequent events up to the cut-off date. [Effective December 31, 2010]
- .03 The pension plan's assets should be valued at liquidation value. [Effective December 31, 2010]

### Scope

- .04 This section is not intended to prescribe the manner in which:
- The pension plan's assets would be allocated between jurisdictions in the case of wind-up of a pension plan covering members in several jurisdictions;
  - Benefit entitlements would be determined;
  - Contributions to a pension benefits guarantee fund would be determined;
  - Funding obligations would be determined; or
  - The pension plan's assets would be allocated between the employer and the members or between members themselves.
- .05 Rather, those issues would be determined in accordance with the law or the plan provisions, or an entity empowered thereunder to make that determination. It may be appropriate, however, to use the results of the valuation to address one or more of those issues, or to disclose their resolution in the report.

### Circumstances of the work

- .06 For the purposes of section 3300, the circumstances affecting the work would include:
- Whether the actuary's advice relates to the funded status or the funding of the pension plan, or a combination thereof;
  - The terms of the appropriate engagement under which the work is being performed; and
  - The application of the law to the work.

### **Cut-off date**

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

### **Partial wind-up**

.08 A partial wind-up occurs when a subset of the members terminates membership in circumstances that 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, also to value the benefits of the continuing members.

.09 The law regarding partial wind-ups varies by jurisdiction. As a result, the application of law can cause a partial wind-up to range from an insignificant change in the pension plan to something similar to a full wind-up.

.10 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; or
- The standard of materiality for reporting wind-up expenses may be less rigorous.

## **3320 Assumptions**

.01 The actuary should select assumptions that:

- Are either best estimate assumptions or are best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, required by law or by the terms of an appropriate engagement;
- Are selected as at the cut-off date; and
- Reflect the expected method of benefit settlement. [Effective February 1, 2018]

.02 Unless it is expected that expenses will not be paid from the pension plan's assets, the actuary should select an explicit assumption regarding the expenses of wind-up and either offset the resulting expense provision against the pension plan's assets or add the resulting expense provision to the pension plan's liabilities. [Effective December 31, 2010]

### 3330 Reporting: External User Report

- .01 If a previous external user report was prepared with respect to the wind-up, the actuary should describe and quantify the gains and losses between the prior calculation date and the calculation date. [Effective December 30, 2012]
- .02 An external user report should:
- Include the wind-up date, the calculation date, the cut-off date, and the report date;
  - Describe the events precipitating the wind-up, of which the actuary is aware, that affect the terms of the wind-up, the benefit entitlements, or the valuation results;
  - Describe the sources of membership data, plan provisions, and the pension plan's assets, and the dates at which they were compiled;
  - Describe the membership data, including any assumptions made about missing membership data;
  - Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
  - Subject to any applicable privacy legislation:
    - Include the detailed individual membership data; or
    - Include an offer to provide detailed individual membership data on request to the employer, the plan administrator, or the regulator;
  - Describe the liquidation value of the assets and a summary of the assets by major category;
  - Describe the pension plan's provisions, including an identification of
    - Any benefits that have been insured;
    - Any amendments made since any previous external user report with respect to the plan which affect benefit entitlements; and
    - Any subsequent events or post-wind-up contingencies, of which the actuary is aware, which affect benefit entitlements;
  - Report the explicit assumption regarding the expenses of wind-up or justify the expectation that expenses will not be paid from the pension plan's assets;

- Report the funded status at the calculation date;
- Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work and, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
- State that the funded status at settlement may differ from that contained in the report unless the report includes the funded status at the time of final settlement;
- State whether an updated report will be required in the future;
- If the actuary relies upon direction concerning unclear or contentious issues,
  - Describe each such issue;
  - Describe the direction relied upon or, where appropriate, a summary thereof; and
  - Identify the person providing such direction and the basis of authority of such person;
- Describe any post-wind-up contingencies that may affect the distribution of the pension plan's assets;
- Describe whether a recalculation of the value of benefit entitlements is required at settlement;
- Where a member has a choice that the member has not yet made between receiving a commuted value and a deferred or immediate pension, describe the assumptions made regarding such choice;
- If applicable, describe the method to allocate the pension plan's assets among classes of members and the method to distribute surplus;
- Describe the actuary's role in calculating commuted values, the standards for their calculation, and an opinion on whether their calculation is in accordance with accepted actuarial practice in Canada; and
- Describe the sensitivity of the valuation results to the pension plan's investment policy and to market conditions between the report date and the settlement date. [Effective March 31, 2015]

- .03 An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:
- A statement regarding membership data, which should usually be, “In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
  - A statement regarding assumptions, which should usually be, “In my opinion, the assumptions are appropriate for the purpose(s) of the valuation(s).”;
  - A statement regarding methods, which should usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose(s) of the valuation(s).”; and
  - A statement regarding conformity, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.” [Effective December 30, 2012]
- .04 The external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the valuation. [Effective December 30, 2012]

#### **Dates**

- .05 The wind-up date of the pension plan would be determined by the regulator, the plan administrator or the plan sponsor based on the plan provisions and the law.
- .06 The calculation date of the funded status would usually be the wind-up date.
- .07 For a particular member:
- The date of calculation of benefit entitlement would depend on the circumstances of the wind-up, the terms of the pension 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 would be the date of settlement of the member’s benefit entitlement.

### **Nature of wind-ups**

- .08 The purpose of a wind-up valuation may be to determine, or to provide, the basis for determining:
- The funded status of the pension plan;
  - The total value of the benefit entitlements of all members prior to taking account of the funded status of the pension 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.
- .09 A wind-up may be complex and may take a long time. Delays may require a series of reports by the actuary. Since the funded status of the pension plan at the final settlement date may affect whether benefit entitlements can be settled in full, the reflection of subsequent events in each report would be critical.
- .10 For example, between the wind-up date and the settlement date:
- The wind-up liabilities may fluctuate if there are fluctuations in interest rates and annuity prices;
  - The pension plan's assets may fluctuate depending upon the manner in which they are invested; and
  - The surplus may fluctuate if the pension plan's assets and liabilities are not matched.
- .11 The actuary would usually report the value of the benefit entitlements of all members and the funded status of the pension plan. That report would be filed with the regulator for approval. After that approval, the plan administrator would settle the benefit entitlements.
- .12 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 pension plan's assets by describing those entitlements and their settlement.

### **Membership data**

- .13 The membership data are the responsibility of the plan administrator. The actuary would, however, report on the sufficiency and reliability of the membership data, specifically including the commuted values used in the valuation whether or not the plan administrator was the calculator thereof.



- .14 The finality of wind-up would call for the actuary to obtain precise membership data. The actuary may, if the circumstances dictate, include contingency reserves in the wind-up valuation with respect to missing members if the actuary believes that additional members still have benefit entitlements under the pension plan but their membership information is missing.
- .15 The reported membership data would include details of the amounts and terms of payment of each member's benefits.

**Assumptions**

- .16 The selected assumptions would:
- In respect of benefit entitlements that are assumed to be settled by purchase of annuities, reflect single premium annuity rates;
  - In respect of benefit entitlements that are assumed to be settled by lump sum transfer, reflect the standards in section 3500 respecting commuted values; and
  - In respect of benefit entitlements that are assumed to be settled in some other manner, reflect the manner in which such benefits would be settled.
- .17 If future benefits depend on continued employment (e.g., the pension plan is terminating but employment is not), the actuary would consider reflecting contingencies such as future salary increases and termination of employment.
- .18 If the pension plan provides special early retirement allowances that may be reduced if the members have employment income following their actual or assumed early retirement dates, then the wind-up valuation would require assumptions regarding the likelihood and the amounts of the members' future employment income. To extrapolate the pension plan's historical experience as a going concern would not necessarily be appropriate in selecting those assumptions.
- .19 Wind-up expenses usually include, but are not limited to:
- Fees related to the actuarial wind-up report;
  - Fees imposed by a regulator;
  - Legal fees;
  - Administration expenses; and
  - Custodial and investment management expenses.

- .20 The actuary would either net wind-up expenses against the pension plan's assets or add the assumed wind-up expenses to the pension plan's liabilities in calculating the ratio of assets to liabilities as a measure of financial security of the benefit entitlements, unless the expectation is that expenses will not be paid from the pension plan's assets. 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.

**Use of another person's work**

- .21 Some aspects of the wind-up may be unclear to the actuary 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 pension plan's assets;
  - The method to allocate the pension 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 pension plan's assets.
- .22 To decide those aspects, the actuary may rely upon 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.

**Post-wind-up contingencies**

- .23 Post-wind-up contingencies may affect benefit entitlements. Examples are:
- Member election of optional forms of benefits;
  - Member election of retirement date;
  - Salary increases; and
  - Change in marital status.

### Subsequent events

- .24 In contrast with a going concern valuation, in a wind-up valuation all subsequent events, ideally, would be reflected. This ensures that the funded status is presented as fairly as possible as of the report date. However, it would be impossible to recognize subsequent events right up to the report date. Accordingly, the actuary would select a cut-off date that is close to the report date.
- .25 The actuary would ascertain that no subsequent events have occurred between the cut-off date and the report date that would change the funded status significantly, 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.
- .26 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.
- .27 Common subsequent events are:
- Contributions;
  - Expenses paid from the pension plan's assets;
  - Actual investment return on the pension plan's assets;
  - Change in annuity purchase rates;
  - Change in assumptions for the calculation of commuted values;
  - Corrections to the membership data;
  - Deaths of members; and
  - Crystallization of post-wind-up contingencies.
- .28 One method for taking account of subsequent events is to determine the value of benefits as of the cut-off date and then discount such value back to the calculation date at an interest rate equal to the rate of investment return, net of investment expenses, earned on the pension plan's assets between the calculation date and the cut-off date. The pension plan's assets would be determined at the calculation date, but adjusted for the subsequent events (such as contributions and non-investment expenses) that affect the pension plan's assets.
- .29 There may be situations where, due to legal or practical considerations, subsequent events are not recognized, at least in a preliminary report and the cut-off date for such a report would be the calculation date. In such reports, the effect of subsequent events may be disclosed and quantified in an approximate manner. 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.

**Statements of opinion**

- .30 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.

## 3400 Financial Reporting of Pension Costs

- .01 This section 3400 applies to advice that an actuary provides with respect to financial reporting of a pension plan's costs and obligations in the employer's or the pension plan's financial statements.

### 3410 General

.01 For financial reporting purposes, the actuary should use methods and assumptions for the value of assets and pension benefit obligations that are appropriate to the basis of financial reporting in the employer's or pension plan's financial statements, as applicable, and that are consistent with the terms of an appropriate engagement. [Effective February 1, 2018]

- .02 The actuary would reflect the financial reporting standards specified by the terms of the appropriate engagement. Where financial reporting standards require methods and assumptions to be established by the preparers of the financial statements, the actuary would use the methods and assumptions specified by the preparers of the financial statements.

#### Assumptions

- .03 The assumptions that the actuary uses would be best estimate assumptions, unless otherwise specified in the relevant financial reporting standards or as otherwise selected by the preparers of the financial statements.

- .04 Repealed

#### Benefit commitments

- .05 The actuary would include in the valuation of pension benefit obligations the effect of a commitment to provide benefits beyond the terms of the plan to the extent stipulated by the preparers of the financial statements.

### 3420 Reporting: External User Report

.01 An external user report should:

- Include the calculation date and the report date;
- Describe the sources of membership data, plan provisions, and the pension plan's assets, and the dates at which they were compiled;
- Describe the membership data;
- Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
- Describe the market value of assets and a summary of the assets by major category;
- Describe the pension plan's provisions;
- Describe any commitment to provide benefits beyond the terms of the plan reflected in the valuation of pension obligations;
- Report the funded status at the calculation date and the applicable service cost;
- Disclose any pending but definitive or virtually definitive amendment of which the actuary is aware, and whether or not such amendment has been included in determining the funded status and the service cost;
- Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, and, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
- Describe any contingent benefits provided under the pension plan and the extent to which such contingent benefits are included or excluded in determining the funded status and the service cost;
- Describe any benefits that are not contingent benefits and that have been excluded in determining the funded status and the service cost;
- Describe the method and period selected in connection with any amortizations;
- If the valuation is an extrapolation of an earlier valuation, then describe the method and any assumptions for, and the period of, the extrapolation; and

- State whether or not the valuation conforms with the actuary's understanding of the financial reporting standards specified by the terms of an appropriate engagement. [Effective March 31, 2015]

.02 An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:

- A statement regarding membership data, which should usually be, "In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.";
- A statement regarding assumptions which should usually be, "In my opinion, the assumptions are appropriate for purposes of the valuation.";
- A statement regarding calculations, which should usually be, "In my opinion, the calculations have been made in accordance with my understanding of the requirements of [name financial reporting standard]"; and
- A statement regarding conformity, which should be, "This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada." [Effective March 31, 2015]

.03 An external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the valuation. [Effective December 30, 2012]

#### **Membership data**

.04 Any assumptions and methods used in respect of insufficient or unreliable membership data would be described.

#### **.05 Reference to report on funding**

The descriptions required in the external user report may be incorporated by reference to an external user report on funding.

## 3500 Pension Commuted Values

### 3510 Scope

- .01 The standards in this section 3500 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 that are described below in paragraph 3510.03. In particular, the standards in this section 3500 apply:
- In a jurisdiction whether or not there is legislation in that jurisdiction that 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 3500 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 3500 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 paragraphs 3510.02 or 3560.01; 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 3500, “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 Since Retirement Compensation Arrangements (RCAs) are not required to be registered under the Income Tax Act (Canada), this section 3500 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.

### 3520 Method

- .01 The commuted value should be independent of the funded status of the pension plan at the valuation date. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]
- .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 3500. [Effective April 1, 2009]

### Valuation date

- .06 The valuation date means the date as of which a value is being computed. Generally, this would be the date upon 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 these standards, the actuary would establish a new valuation date. The actuary would make calculations at the new valuation date in accordance with the standards 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 that 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 that 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 that 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 3520.09 and 3520.10 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 these standards 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.

### 3530 Demographic Assumptions

- .01 Except for situations specifically noted below, the actuary should assume:
- Separate mortality rates for male and female members; and
  - Mortality rates in accordance with a mortality table promulgated from time to time by the Actuarial Standards Board for the purpose of these calculations. [Effective February 1, 2014]
- .02 No adjustment should be made to reflect the health or smoker status of the member. [Effective February 1, 2014]
- .03 The current age of the plan member should be used when valuing an immediate pension. [Effective February 1, 2014]
- .04 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. [Effective February 1, 2018]
- .05 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. [Effective February 1, 2014]
- .06 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 that 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 3520.09. [Effective February 1, 2018]
- .07 The demographic assumptions would be the same for all types of immediate and deferred pensions.

### **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.

### **3540 Economic Assumptions**

- .01 The actuary should select economic assumptions that vary depending on whether the pension is fully indexed, partially indexed or non-indexed. [Effective April 1, 2009]
- .02 If the valuation date is on or before January 31, 2011, 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. If the valuation date is on or after February 1, 2011, the actuary should select economic assumptions that depend on the reported rates for the applicable CANSIM series for the calendar month immediately preceding the month in which the valuation date falls. [Effective April 1, 2009]
- .03 The actuary should calculate two interest rates, one applicable to the first 10 years after the valuation date and the second applicable to all years thereafter. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]

.05 The actuary should determine from the CANSIM series the following three factors.

CANSIM Series	Description	Factor
V122542	Seven-year Government of Canada benchmark bond yield, annualized (final Wednesday of month)	$i_7$
V122544	Long-term Government of Canada benchmark bond yield, annualized (final Wednesday of month)	$i_L$
V122553	Long-term real-return Government of Canada bond yield, annualized (final Wednesday of month)	$r_L$

Note that the factors determined above are not the reported CANSIM series, but the annualized value of the reported figure. [Effective April 1, 2009]

.06 The actuary should also determine a fourth factor, calculated as:

$$r_7 = r_L * (i_7 / i_L) \text{ [Effective April 1, 2009]}$$

.07 The actuary should determine the interest rates from the following:

	Non-Indexed	Indexed
First 10 Years	$i_{1-10} = i_7 + 0.90\%$	$r_{1-10} = r_7 + 0.90\%$
After 10 Years	$i_{10+} = i_L + 0.5 * (i_L - i_7) + 0.90\%$	$r_{10+} = r_L + 0.5 * (r_L - r_7) + 0.90\%$

[Effective April 1, 2009]

.08 The actuary should calculate the commuted value of a non-indexed pension using a two-tier interest rate of:

$$i_{1-10} \text{ for the first 10 years and } i_{10+} \text{ thereafter. [Effective April 1, 2009]}$$

.09 The actuary should calculate the commuted value of a pension that is fully indexed to increases in the Consumer Price Index using a two-tier interest rate of:

$$r_{1-10} \text{ for the first 10 years and } r_{10+} \text{ thereafter. [Effective April 1, 2009]}$$

The UP-94 Table and Projection Scale AA were published in the Transactions of the Society of Actuaries, Volume XLVII (1995).

- .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. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]
- .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 non-indexed interest rates determined in accordance with paragraph 3540.07. [Effective February 1, 2018]
- .13 Prior to calculating the commuted value, the actuary should round the rates of interest determined in accordance with this subsection 3540 to the nearest multiple of 0.10%. 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, 2018]

#### **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 non-indexed interest rates determined in accordance with paragraph 3540.07, the actuary would appropriately reduce the rate of interest to reflect the actuary's expectation of the difference between the non-indexed interest rates determined in accordance with paragraph 3540.07 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 would 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 3540.13, internally consistent.

### 3550 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 funded status 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 these standards. [Effective February 1, 2018]
- .02 Where the commuted value has not been determined in accordance with these standards, the actuary should clearly state that the calculation is not in compliance with these standards and disclose all areas of noncompliance and the reasons for the noncompliance. [Effective April 1, 2009]
- .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 these standards. [Effective February 1, 2018]



### Disclosure of plan values which differ from these standards

- .04 In a situation where the use of commuted values (called plan values in this subsection 3550) that are different from those computed in accordance with this section 3500, 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 standards; 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 standards. [Effective February 1, 2018]
- .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. [Effective April 1, 2009]
- .06 Where the actuary uses assumptions or methods described in these standards to calculate a commuted value in a situation where these standards does not apply, the actuary should not state or imply that the commuted value has been computed in accordance with these standards. [Effective February 1, 2018]

### 3560 Reduced Life Expectancy

- .01 The standards in this subsection 3560 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. These standards may also be applicable in other directly comparable situations.
- .02 These standards do 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 subsections of section 3500 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. [Effective April 1, 2009]
- .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. [Effective April 1, 2009]
- .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 3560 and the amount computed in accordance with subsections 3520 through 3540 without regard to shortened life expectancy. [Effective April 1, 2009]

### **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 as in (a) above and a value determined as if the member 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 would be determined as for pensioners in (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**

## Table of Contents

<b>4100</b>	<b>Scope</b> .....	<b>4003</b>
<b>4200</b>	<b>General</b> .....	<b>4006</b>
4210	Circumstances affecting the work.....	4006
4220	Financial interest of the actuary .....	4007
4230	Role as expert.....	4007
4240	Testimony.....	4008
4250	Capitalized Values .....	4009
<b>4300</b>	<b>Actuarial Evidence Calculations, Other than Capitalized Value of Pension Plan Benefits for a Marriage Breakdown and Criminal Rate of Interest</b> .....	<b>4010</b>
4310	Scope .....	4010
4320	Assumptions and methods.....	4010
4330	Contingencies.....	4011
4340	Application of law.....	4011
<b>4400</b>	<b>Capitalized Value of Amounts Other than Pension Plan Benefits for a Marriage Breakdown</b> .....	<b>4013</b>
4410	Scope .....	4013
4420	Assumptions and methods.....	4013
<b>4500</b>	<b>Capitalized Value of Pension Plan Benefits for a Marriage Breakdown</b> .....	<b>4015</b>
4510	Scope .....	4015
4520	Method.....	4015
4530	Assumptions.....	4020
4540	Reporting: external user report .....	4023
<b>4600</b>	<b>Calculation of Criminal Rate of Interest</b> .....	<b>4024</b>
4610	Scope .....	4024
4620	Data .....	4024
4630	Method.....	4024
<b>4700</b>	<b>Reporting</b> .....	<b>4026</b>
4710	External user report .....	4026
4720	Internal user report.....	4028

## 4100 Scope

- .00 Part 1000 applies to work within the scope of this part 4000.
- .01 The standards in part 4000 apply to actuarial evidence work.
- .02 With respect to actuarial evidence work:
- An expert is an actuary who is qualified by knowledge, skill, experience, training, or education to render an opinion or otherwise testify concerning the matter at hand; and
  - An expert opinion is a conclusion drawn from actuarial knowledge and experience or from the application of one or more actuarial methods to a body of data.
- .03 An expert opinion may be provided in a written report, oral or written testimony, or both.
- .04 The provision of an expert opinion which is actuarial evidence work and which involves a practice area such as insurance or pensions is work in both that practice area and the actuarial evidence practice area. The actuary would refer to the standards applicable to that practice area, in addition to the standards in part 4000.

### Examples

- .05 Examples of actuarial evidence work are:
- Determination of the capitalized value of pecuniary losses arising as a result of an event such as personal injury, death, or wrongful dismissal from employment;
  - Determination of capitalized values of pensions in marriage breakdown proceedings;
  - Expert opinions given in litigation arising from work completed in respect of a pension plan or an insurance business;
  - Work as an expert advisor to a mediating official, such as a judge;
  - Determination of effective rates of interest in cases of alleged charging of criminal interest rates; and
  - Provision of an expert opinion with respect to another actuary's work that is being challenged or in cases of alleged professional negligence.

- .06 Work in a practice area, such as insurance or pensions, may be performed in an adversarial environment but not involve an anticipated expert opinion for a dispute resolution proceeding. Such work would not normally be considered to be actuarial evidence work. Examples of such work, where the standards in part 4000 are not applicable, are:
- Pension plan valuations or costings related to union negotiations, or actuarial assistance with the merger of pension plans or the valuation of a pension plan in connection with the sale of a business; and
  - Actuarial assistance with the valuation of an insurer, the merger of insurers, or the acquisition of an insurer.

**Fact evidence**

- .07 The standards in part 4000 do not apply to the work of an actuary who is providing only fact evidence, and not an expert opinion. For example, an actuary testifying in his or her own defense in a proceeding related to professional negligence would normally be providing fact evidence, and not an expert opinion. As another example, an actuary may be providing evidence in a dispute resolution proceeding regarding his or her involvement in work performed in a practice area such as insurance or pensions. If the circumstances were not adversarial and there was no anticipation of a dispute resolution proceeding at the time the work was performed, the actuary's evidence in the dispute resolution proceeding would normally be fact evidence and not an expert opinion. The standards in part 4000 would apply, however, if the actuary's role includes providing an expert opinion in a dispute resolution proceeding, where such opinion is expected or required to be independent.

**Litigation advice**

- .08 The terms of an appropriate engagement may require that the actuary provide only litigation advice, other than an expert opinion that is expected or required to be independent, such as assisting counsel or a client in identifying and analyzing legal or actuarial issues, advising in connection with relevant case law, and preparing for cross-examination of opposing witnesses. In such cases, provided that the actuary makes it clear that the work product does not represent an expert opinion that is actuarial evidence work, the standards in part 4000 would not apply.
- .09 The terms of an appropriate engagement may require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion. If work related to the expert opinion meets the definition of actuarial evidence work, then the standards in part 4000 would apply to that aspect of the engagement.

**Additional guidance**

.10 Repealed



## 4200 General

### 4210 Circumstances affecting the work

- .01 When performing actuarial evidence work, the actuary should take into account the circumstances affecting the work. [Effective February 1, 2018]
- .02 The circumstances affecting the work would include:
- Relevant legislative or regulatory provisions;
  - Rules of civil procedure and rules of court in the relevant jurisdictions;
  - Other rules that may be applicable to the dispute resolution proceeding;
  - Established legal principles relevant to the work; and
  - Terms of an appropriate engagement under which the work is being performed.
- .03 Relevant legislative or regulatory provisions may include:
- Provisions relating to allowable pecuniary damages under automobile insurance legislation or regulations;
  - Provisions related to division of assets under a marital property act or regulations; and
  - Provisions relating to pensions, benefits, insurance, or workers' compensation.
- .04 Rules of civil procedure and rules of court, as well as other rules that may be applicable to the dispute resolution proceeding, may include:
- Mandated assumptions;
  - Required content and format of reports;
  - Role of experts; and
  - Duties and obligations of experts.
- .05 Established legal principles relevant to the work may address:
- Issues relevant to the actuary's engagement; and
  - Role and obligations of experts.
- .06 The terms of an appropriate engagement would define the role of the actuary and the purpose, context, and scope of the work. An engagement for actuarial evidence work would not be appropriate if it would impair the ability of the actuary to perform independent and objective work.

- .07 Significant terms of an appropriate engagement may stipulate one or more of:
- Assumptions to be used in the actuary's work;
  - Methods to be used in the actuary's work; and
  - Various scenarios to be considered by the actuary.
- .08 An engagement may be appropriate if its terms require that the actuary assist his or her client or counsel with challenging the application or a particular interpretation of existing law, regulation, court practice, or established legal principles relevant to the work. Nothing in part 4000 is intended to prevent the actuary from assisting with a challenge of the application or a particular interpretation of existing law, regulation, court practice, or established legal principles relevant to the work, even if the result of such challenge of the application or a particular interpretation would otherwise, in the opinion of the actuary, be inconsistent with accepted actuarial practice.

#### **4220 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., dispute resolution proceeding) in connection with which the work is done. [Effective December 31, 2013]
- .02 For example, contingency fees that depend on the outcome of the dispute resolution proceeding would not be appropriate.

#### **4230 Role as expert**

- .01 The actuary's actuarial evidence work should be independent and objective. [Effective December 31, 2013]
- .02 The actuary's role as an expert should be to assist the court or other entity in the dispute resolution proceeding in its search for truth and justice, and the actuary should not be an advocate for one side of the matter in dispute. [Effective December 31, 2013]
- .03 Where the terms of the engagement require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion that is actuarial evidence work, the litigation advice role should not influence the independence and objectivity of such expert opinion. [Effective December 31, 2013]

- .04 Where the actuary is providing both litigation advice that is not actuarial evidence work and an expert opinion that is actuarial evidence work, the actuary would have a clear understanding of the differences between the two roles included in the engagement. The actuary would clearly identify in any work product which component of the engagement is involved, and would ensure that the litigation advice role does not impair his or her ability to perform the actuarial evidence work.

#### **4240 Testimony**

- .01 The actuary's testimony should be independent, objective, and responsive. [Effective December 31, 2013]
- .02 Where the terms of the engagement require that the actuary provide both litigation advice that is not actuarial evidence work and also an expert opinion that is actuarial evidence work, the actuary should be aware that full disclosure of all work and work products with respect to both roles within the engagement may be required in any testimony. [Effective December 31, 2013]
- .03 In the course of providing testimony in the dispute resolution proceeding, the actuary should:
- 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;
  - Apply best efforts to ensure that the evidence is clear and complete, that the information the actuary is providing will not be misunderstood or misinterpreted, and that the audience will be able to utilize it correctly; and
  - Indicate when a particular issue or question falls outside his or her expertise. [Effective December 31, 2013]
- .04 The actuary should respond truthfully and fully to questions posed in the course of providing testimony, but the actuary need not volunteer information which is beyond the scope of the question posed. [Effective December 31, 2013]

- .05 Testimony is the actuary's communication presented in the capacity of an expert witness in any dispute resolution proceeding where the actuary is examined or cross-examined. Such testimony may be oral or written, direct or responsive, formal or informal.
- .06 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 truthfully and fully, notwithstanding paragraph 4710.08.

## 4250 Capitalized Values

- .01 The actuary should calculate the capitalized value of future amounts payable in respect of an individual utilizing the actuarial present value method. [Effective December 31, 2013]
- .02 Actuarial evidence work frequently deals with the determination of the capitalized value of amounts for purposes of a dispute resolution proceeding. 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 law, regulation, and/or legal precedent.
- .03 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 require payment of a capitalized value when payment of the defined amounts comprising that value is not practical or not desired.
- .04 Calculation of the capitalized value is within the domain of actuarial practice.
- .05 The actuary would not calculate the capitalized value of future amounts that are subject to any contingent event as the present value of an annuity certain. For example, when utilizing the actuarial present value method in respect of a life annuity, the capitalized value of each life annuity payment is weighted by the probability of survival to the date of that payment. Under this method, the present value of possible overcompensation in an individual circumstance is balanced by the present value of possible undercompensation.

## **4300 Actuarial Evidence Calculations, Other than Capitalized Value of Pension Plan Benefits for a Marriage Breakdown and Criminal Rate of Interest**

### **4310 Scope**

- .01 The standards in section 4300 apply to an actuary's advice when performing actuarial evidence calculations, other than for the capitalized value of pension plan benefits for a marriage breakdown and for a criminal rate of interest.

### **4320 Assumptions and methods**

- .01 The assumptions and methods selected by the actuary should be appropriate in the aggregate, taking into account the purpose of the work and the parts of the standards that are applicable to the actuary's work. [Effective December 31, 2013]
- .02 The assumptions selected by the actuary should be best estimate assumptions, unless it is appropriate to incorporate margins for adverse deviations in accordance with the circumstances affecting the work. [Effective February 1, 2018]
- .03 The actuary should ensure that any assumptions stipulated by the terms of the engagement are plausible. [Effective December 31, 2013]
- .04 The assumptions and methods used by the actuary should take account of the circumstances affecting the work, including applicable law, regulation, court practice, and established legal principles relevant to the work. [Effective February 1, 2018]
- .05 The assumptions and methods selected by the actuary should not be influenced by the party to the dispute resolution proceeding that has retained the actuary. [Effective December 31, 2013]
- .06 Examples of the circumstances affecting the work where it would be appropriate to incorporate a margin for adverse deviations in an assumption include, but are not limited to:
- The assumption or the requirement for a margin for adverse deviations is mandated by law, regulation, court practice, or established legal principles relevant to the work; and
  - The actuary's work relates to a practice area such as insurance or pensions, and the standards for that practice area require or permit the inclusion of a margin for adverse deviations for such work.

- .07 Notwithstanding paragraph 4320.03, the terms of an appropriate engagement may stipulate assumptions that are not considered plausible by the actuary or methods that are not considered appropriate by the actuary. In such case, if the actuary performs the work in accordance with the terms of the engagement, the actuary would report the deviation from accepted actuarial practice in Canada.
- .08 The terms of the engagement may require that the actuary complete calculations for related items, such as one calculation for the capitalized value of a pecuniary loss and another calculation for the income tax gross-up. The underlying assumptions would be consistent for the calculation of these related items. In this example, the actuary would utilize the same underlying assumptions, such as the same real rate of interest, the same rate of price inflation, and the same mortality assumption, for both the calculation of the capitalized value of the loss and the calculation of the income tax gross-up.
- .09 Where there are insufficient data to support a particular assumption regarding a contingency incorporated in the actuary's work, the actuary may present a range of results.

### 4330 Contingencies

- .01 The actuary should consider incorporating any contingency where, in the actuary's opinion, there are adequate legal, theoretical, or empirical grounds to justify this. The actuary should disclose the omission from the work of any contingencies he or she considers material. [Effective December 31, 2013]
- .02 If the actuary gives advice on the effect of a specific contingency, that advice should be based on an assessment of that contingency, both alone and in combination with other factors, using appropriate actuarial methods. [Effective December 31, 2013]

- .03 Where the actuary has prepared results under more than one scenario, the actuary's report would show the results of the actuarial calculations separately for each scenario and identify which contingencies have been incorporated in each scenario. For example, the results of the actuarial calculations under one scenario may include precise recognition of only net investment return and mortality. The results taking into account any other provision for contingencies would be prepared under another scenario and would be reported separately.
- .04 Recognition of a contingency may create a positive or negative effect on a calculation.

### 4340 Application of law

- .01 In a situation where law, regulation, court practice, or established legal principles relevant to the work mandates that a method or assumption be adopted in an actuarial evidence calculation, a broad interpretation of accepted actuarial practice in Canada is appropriate, so that in most such situations the law, regulation, court practice, or established legal principles relevant to the work would be considered to be within the range of accepted actuarial practice in Canada.

- .02 Repealed
- .03 Where an assumption is mandated by law, regulation, court practice, or established legal principles relevant to the work, such assumption may be outside of the range of assumptions that the actuary considers to be reasonable.

## 4400 Capitalized Value of Amounts Other than Pension Plan Benefits for a Marriage Breakdown

### 4410 Scope

- .01 The standards in section 4400 apply to an actuary's advice when calculating the capitalized value of amounts other than pension plan benefits for a marriage breakdown. A capitalized value relates to amounts payable at various times, each amount subject to various contingencies related to the individual or to the individual's dependants. Examples of situations where capitalized values may be calculated are:

<u>Event</u>	<u>Capitalized Value of:</u>
Disability	individual's loss of earnings, loss of household services, and/or cost of extraordinary expenses attributable to the disability.
Death	dependant's loss of financial support and/or loss of household services.
Wrongful dismissal	individual's loss of earnings, pension benefits, and/or employer-sponsored benefits other than pensions.
Marriage breakdown	individual's support obligations.

### 4420 Assumptions and methods

#### 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 is established. For example, in an accident caused by negligence, litigation of the damages may result in the capitalized value becoming payable several years after the accident. Then the damages consist of those in respect of both the period before and the period after the date at which the capitalized value is established, called "past losses" and "future losses", respectively.

#### Income tax

- .02 Subject to the terms of the engagement, the actuary may include an appropriate allowance in the capitalized value calculation for the expected effect of income tax, taking account of applicable law, regulation, court practice, and established legal principles relevant to the work. The actuary's report would deal with income tax in an internally consistent way, and the report would fully disclose the assumptions and methods utilized.



**Investment expenses**

- .03 Subject to the terms of the engagement, the actuary may include an appropriate allowance in the capitalized value calculation for any expenses expected with respect to the future investment, management, or administration of any settlement amount, taking account of applicable law, regulation, court practice, and established legal principles relevant to the work. The actuary's report would deal with such investment expenses in an internally consistent way, and the report would fully disclose the assumptions and methods utilized.

## 4500 Capitalized Value of Pension Plan Benefits for a Marriage Breakdown

### 4510 Scope

- .01 The standards in this section 4500 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 4500, "plan" means "pension plan" and is broadly defined, including not only a plan that 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 4500 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 4500 may provide useful guidance for similar 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.
- .05 The standards in this section 4500 do not apply when applicable legislation mandates a different basis for the calculation of the value of a pension for family property purposes at the breakdown of the marriage of a plan member.

### 4520 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. [Effective January 1, 2004]
- .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 calculation 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 take into account further 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 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 five-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 may be 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 that 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 4520.11 are those payable by the plan as a going concern, and not those payable on plan wind-up, if different, unless the plan has been fully wound up or partially wound up with respect to the plan member.
- .14 Where various legal interpretations for a specific question appear possible, the actuary would obtain clarification of such unclear matters from the instructing lawyer or from another authoritative source. If that is not possible, the actuary would advise that various interpretations exist, and would report the effects of these interpretations or report 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 use of an alternative calculation date, close to the 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 calculation date, close to the 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 that 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:
- 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 that 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 that 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 indexation 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 would 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, would disclose the use of any tax provisions that have not yet been enacted.
- .28 The actuary may report useful alternative calculations that take income tax into account.

### 4530 Assumptions

- .01 The actuary should select all assumptions, except those depending upon interpretation of applicable law. [Effective January 1, 2004]

### Mortality rates

- .02 The actuary should assume mortality rates in accordance with a mortality table promulgated from time to time by the Actuarial Standards Board 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, 2012]

- .03 Tobacco use (or lack of tobacco use) would not, in itself, be sufficient reason to modify the mortality rates identified above.
- .04 Use of unisex mortality 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 that was or would be calculated under a unisex basis.

### 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 4530.05 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.

**Economic assumptions**

.08 The actuary should select economic assumptions that depend on the reported rates for the applicable CANSIM series for the calendar month immediately preceding the month in which the calculation date falls. [Effective January 1, 2012]

.09 The actuary should determine from the CANSIM series the following four factors:

<b>CANSIM Series</b>	<b>Description</b>	<b>Factor</b>
V122487	average long (>10 yrs) Government of Canada bond yields (final Wednesday of month)	$G_L$
V122544	long-term Government of Canada benchmark bond yield, annualized (final Wednesday of month)	$b_L$
V122553	long-term Government of Canada real return bond yield, annualized (final Wednesday of month)	$r_L$
$(1 + b_L)/(1 + r_L) - 1$	break-even inflation rate	BEIR

Note that the factors determined above do not reflect the reported CANSIM series, but the annualized value of the reported figure. [Effective January 1, 2012]



### Inflation and indexing

.10 The actuary should calculate the projected benefit obligation for a pension that is fully indexed to increases in the Consumer Price Index using an assumed inflation rate of EI. For pensions that are partially indexed to increases in the Consumer Price Index, the actuary should derive inflation rates in a like manner by applying to the stipulated inflation rates the partial indexing formula of the plan. [Effective January 1, 2012]

.11 The actuary should determine the assumed rate of inflation EI as:

- First 20 years  $EI_{0-20} = BEIR$
- After 20 years  $EI_{20+} = 2.25\%$

EI should be rounded to the nearest multiple of 0.01%. [Effective January 1, 2012]

.12 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 EI. [Effective January 1, 2012]

.13 The capitalized value of a fully- or partially-indexed pension should be at least equal to the capitalized value applicable to a non-indexed pension in the same amount and having similar characteristics. [Effective January 1, 2012]

.14 Where the plan so provides, 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 expected inflation rate for a year to reflect the probability and extent of modification for that year.

.15 If the pension is indexed using an “excess investment return” approach, the expected indexation rate would be determined using the “floor rate” and the interest rates determined in accordance with paragraph 4530.18 to produce an expected indexation rate consistent with excess interest situations.

.16 For a pension in a plan that has a policy or a history of indexing on an ad hoc basis, the actuary would determine an indexation rate consistent with the indexing policy or history.

### Interest rates

- .17 The actuary should calculate two interest rates, one applicable to the first 20 years following the calculation date, and the second one applicable to all years thereafter. [Effective January 1, 2012]
- .18 The actuary should determine the interest rates as:
- First 20 years  $i_{0-20} = G_L + 0.50\%$
  - After 20 years  $i_{20+} = 5.50\%$
- Prior to calculating the capitalized value, the actuary should round the rates of interest determined in accordance with this paragraph to the nearest multiple of 0.1%. [Effective January 1, 2012]
- .19 The actuary should calculate the capitalized value of a pension using a two-tier interest rate of:
- $i_{0-20}$  for the first 20 years; and
  - $i_{20+}$  thereafter. [Effective January 1, 2012]

### 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.

### 4540 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 in Canada, 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

## 4600 Calculation of Criminal Rate of Interest

### 4610 Scope

- .01 The standards in section 4600 apply to an actuary's advice when determining whether the interest rate for a particular agreement or arrangement is a "criminal rate".
- .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 60 percent on the credit advanced under an agreement or arrangement.

### 4620 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. [Effective December 31, 2013]
  - .02 The actuary should report all data used in the calculation, and their sources. [Effective February 1, 2018]
- .03 If data are not clear from the initial terms of the engagement, the actuary would obtain clarification from his or her 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).

### 4630 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  $r^{\text{th}}$  payment advanced by the lender;
- $B_s$  is the amount of the  $s^{\text{th}}$  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  $r^{\text{th}}$  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; and
- $t_s$  is the period measured in years (including fractional parts of a year) between the time that the  $s^{\text{th}}$  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 December 31, 2013]

- .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 that are positive and real, or zero.
- .03 The formula in paragraph 4630.01 applies in most, but not all, situations.

## 4700 Reporting

### 4710 External user report

- .01 For work pursuant to part 4000, any external user report that is prepared should:
- 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;
  - State the effective date of the report and the effective date of any actuarial opinions and calculations in the report;
  - Describe any terms of the appropriate engagement that are material to the actuary's work, including the role of the actuary, the scope and purpose of the work, any limitations or constraints on the work and any stipulated assumptions or methods;
  - Where the actuary is aware of circumstances where the independence of his or her expert opinion may reasonably be questioned, disclose such circumstances;
  - Disclose the results of the work;
  - Describe the data, methods, and assumptions used for the work, including the terms and the amounts of the payments relevant to any calculations, for each of the scenarios presented in the report;
  - Identify the assumptions and methods that are constrained by law, regulation, court practice, or established legal principles relevant to the work;
  - Identify the differences between scenarios where the results of multiple scenarios are presented;
  - Identify any margins for adverse deviations that are included, except where the assumption or method is mandated by law, regulation, court practice, or established legal principles relevant to the work, and the rationale for inclusion of any identified margins for adverse deviations;
  - Describe every contingency that has been taken into account, and state that there may be other contingencies that could have a positive or negative effect that have not been taken into account;
  - Disclose the extent of the actuary's reliance on others;
  - List the sources of information on which the actuary has relied; and
  - Include any other information required in accordance with the rules of civil procedure, the rules of law, or other rules that may be applicable for the relevant jurisdiction. [Effective February 1, 2018]

- .01.1 Notwithstanding paragraph 1710.01, the actuary is not required to provide an opinion on assumptions which are stipulated by the terms of engagement provided such assumptions are plausible in accordance with paragraph 4320.03. [Effective February 1, 2018]
- .01.2 Notwithstanding paragraph 1710.01, the actuary is not required to provide an opinion on assumptions or methods described in paragraph 4340.01 which are within the range of accepted actuarial practice pursuant to paragraph 4340.01. [Effective February 1, 2018]
- .02 The actuary's external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the results. [Effective December 31, 2013]

- .03 The actuary would prepare any draft reports and other documentation, taking into account the potential disclosure of such documents that may be required as part of the dispute resolution proceedings.
- .04 Where the actuary reports the results of a capitalized value calculation without reservation, the disclosure wording that may be used is:

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 in Canada. It is my opinion that the assumptions and methods for which I have taken responsibility are appropriate in the circumstances of this case and for the purpose of this report.

Respectfully submitted,

[actuary]

Fellow, Canadian Institute of Actuaries

#### **Reporting with reservation**

- .05 Reporting with reservation or stating that the reporting requirements have not been followed would not excuse an actuary from these reporting standards.
- .06 Notwithstanding paragraph 4340.01, the circumstances affecting the work may result in deviation from accepted actuarial practice in Canada. For example, the terms of the engagement may require that the actuary use an assumption that is outside of the range that the actuary considers plausible, or that the actuary use a method that the actuary considers is not appropriate, or that the actuary assist counsel with challenging a specific interpretation of the law. In such case, the actuary would disclose such deviation in the report.

#### **New information**

- .07 Notwithstanding paragraph 1420.01, where an event occurs, such as the availability of new information, after the actuary has completed his or her report, the actuary would consider the potential effect of such event on his or her work, and would advise his or her client on a timely basis, if appropriate and subject to the terms of the engagement.

**Disclosure of other expert's report**

- .08 The external user report need not disclose any error or shortcoming that the actuary identifies in the report of another actuary or other expert witness.

**4720 Internal user report**

.01 Unless an internal user report conforms to the recommendations for an external user report, an internal user report should state that it is not to be given to an external user. [Effective December 31, 2013]

- .02 For the purpose of determining whether or not the work is in accordance with accepted actuarial practice, an internal user report continues to be an internal user report even if, in breach of the statement required by paragraph 4720.01, it is given to an external user or utilized in the dispute resolution proceeding.

## **5000—Public Personal Injury Compensation Plans**



## Table of Contents

<b>5000</b>	<b>Public Personal Injury Compensation Plans.....</b>	<b>5001</b>
<b>5100</b>	<b>Scope.....</b>	<b>5003</b>
<b>5200</b>	<b>Extension of scope.....</b>	<b>5004</b>
<b>5300</b>	<b>General.....</b>	<b>5005</b>
5310	Circumstances affecting the work.....	5005
5320	Data .....	5006
<b>5400</b>	<b>Benefits liabilities .....</b>	<b>5007</b>
5410	Methods .....	5007
5420	Assumptions.....	5008
5430	Economic assumptions.....	5009
5440	Non-economic assumptions.....	5010
5450	Margins for adverse deviations.....	5011
5460	Sensitivity testing .....	5012
<b>5500</b>	<b>Other related items.....</b>	<b>5014</b>
<b>5600</b>	<b>Gain and loss analysis.....</b>	<b>5015</b>
<b>5700</b>	<b>Reporting .....</b>	<b>5016</b>

## 5100 Scope

- .00 Part 1000 applies to work within the scope of this part 5000.
- .01 The standards in this part apply to an actuary's work on the valuation of benefits liabilities of a public personal injury compensation plan, including its benefits liabilities in respect of a self-insured employer, and to any other items required under the terms of an appropriate engagement for a public personal injury compensation plan, for the purpose of its financial statements and for the purpose of providing input into its funding arrangements.
- .02 The standards in this part do not apply to an actuary's work for an employer on the valuation of benefits liabilities and other related items in respect of its employees who are covered by a self-insured element of a public personal injury compensation plan, where such work is covered by the Practice-Specific Standards for Post-Employment Benefit Plans. Nevertheless, the standards in this part may provide useful guidance for such work.

## **5200 Extension of Scope**

- .01 The standards in this part may also provide useful guidance for other work of an actuary for a public personal injury compensation plan, such as work on the development of assessment rates or premiums, the costing of benefits or policy changes, or work on experience-rating programs.
- .02 The standards in this part do not, however, provide useful guidance in the case of an entity merely because it is a monopoly, such as a monopoly of benefits that are optional or a government monopoly that is required to operate like a private sector entity.

## 5300 General

### 5310 Circumstances affecting the work

- .01 The actuary's work on the valuation of the benefits liabilities or other items for the purpose of the financial statement of a public personal injury compensation plan or for the purpose of providing input into its funding arrangements should take into account the circumstances affecting the work. [Effective February 1, 2018]
- .02 The circumstances affecting the work would include
- terms of the relevant statute,
  - relevant accounting standards and policies, and
  - terms of an appropriate engagement under which the work is being performed,
- and the circumstances affecting the work may include the funding policy of the public personal injury compensation plan.
- .03 The terms of an appropriate engagement would define the role of the actuary and the purpose of the work. The work of the actuary may be limited to the valuation of the benefits liabilities, or the work may also include the provision of advice on the funding of the public personal injury compensation plan, its financial position, its financial condition and any other actuarial item required under the terms of an appropriate engagement.
- .04 The terms of an appropriate engagement may specify applicable policies of the public personal injury compensation plan relevant to the work of the actuary. These policies may include a formal or informal funding policy, an accounting policy and an investment policy.
- .05 Significant terms of an appropriate engagement may stipulate one or more of
- use of a specified asset value or method of asset valuation, and
  - depending on the circumstances affecting the work, treatment of definitive amendments and other pending changes.
- .06 Objectives of funding specified by the terms of an appropriate engagement may include, but are not limited to, a specific funding target, the security of benefits, a principle of equity among various groups of employers or various groups of individuals or among generations, or a funding approach for occupational disease claims.

## 5320 Data

- .01 Where sufficient, reliable and relevant data are not available for the valuation of a specific benefit, the actuary should make appropriate assumptions or introduce appropriate methods to compensate for any perceived deficiencies in the data.  
[Effective February 1, 2018]
- .02 Sufficient, reliable and relevant data may not be available to the actuary in various circumstances, for example,
- the relevant statute may have been amended to provide a new or revised benefit,
  - an applicable policy of the public personal injury compensation plan may have been revised recently,
  - the public personal injury compensation plan's claim adjudication practices or administration practices may have changed recently,
  - a recent appeal decision may be expected to have a material effect on future benefit payments, or
  - economic conditions or health care practices in the relevant jurisdiction may have changed, which may be expected to have a material effect on benefits.
- .03 Where the data are not sufficient, not fully reliable or not sufficiently relevant to expected future experience for a specific benefit, the actuary may consider taking one or more of the following actions,
- introducing appropriate assumptions regarding missing, incomplete or unreliable data, and
  - adjusting data and historic claim settlement patterns for the purpose of the work, as appropriate, to remove any perceived distortions, such as the effect of historical inflation or one-time benefit changes.

## 5400 Benefits liabilities

### 5410 Methods

- .01 The actuary should value the benefits liabilities assuming that the public personal injury compensation plan continues indefinitely as a going concern entity. [Effective February 1, 2018]
- .02 The value of the benefits liabilities is the value, by the actuarial present value method, of cash flows after the calculation date with respect to all claims incurred before that date and not fully discharged as of that date, whether reported or not, and for calculation dates on and after December 31, 2014, the value, by the actuarial present value method, of cash flows after the calculation date with respect to workplace exposures that have occurred prior to that date. The workplace exposures should include those which may potentially lead to occupational disease claims, in accordance with the policy of the plan. [Effective March 15, 2011]
- .03 The cash flows after the calculation date on account of all claims incurred before that date should include all expenses expected to be incurred after the calculation date which are related to those claims, including relevant administration expenses. [Effective March 15, 2011]
- .04 The actuary's work should take into account the benefits, relevant policies and administration practices of the public personal injury compensation plan as of the calculation date, and should take into account any definitive amendment to these items that is expected to have a material effect on benefits, unless the circumstances affecting the work require otherwise. [Effective February 1, 2018]
- .05 The benefits liabilities should include an amount in respect of benefits for employees of a self-insured employer, unless the exclusion of such benefits is in accordance with the circumstances affecting the work. [Effective February 1, 2018]
- .06 When estimating the benefits liabilities, the actuary should consider all claims, whether reported or not, until the claims are fully discharged or closed, with no or minimal chance of re-opening. [Effective February 1, 2018]

### **Occupational disease**

- .07 The actuary would value the benefits liabilities in respect of occupational disease claims, and would include the benefits liabilities for all occupational disease claims reported prior to the calculation date.
- .08 For calculation dates on or after December 31, 2014, the actuary would also include in the benefits liabilities an appropriate allowance for all occupational disease claims expected to arise after the calculation date as a result of exposures incurred in the workplace prior to the calculation date in respect of occupational diseases with a long latency period that are recognized as such by the public personal injury compensation plan, by legislation, by regulation, or by appeal, regardless of the public personal injury compensation plan's approach to funding potential occupational disease claims. For calculation dates preceding December 31, 2014, the actuary may include in the benefits liabilities an appropriate allowance for such potential occupational disease claims.

### **Amendments and subsequent events**

- .09 The actuary's valuation of the benefits liabilities would normally reflect all definitive amendments of which the actuary is aware on the calculation date, including those amendments with an effective date after the calculation date. Where the circumstances affecting the work require otherwise, the actuary may exclude the effect of a known definitive amendment, but the actuary would disclose the effect of such amendment.

### **5420 Assumptions**

- .01 The actuary should set assumptions that reflect the expectation that the public personal injury compensation plan will continue indefinitely as a going concern entity, but may make adjustment for short-term considerations, where appropriate. [Effective February 1, 2018]
- .02 The actuary should select either best estimate assumptions or best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, required by law or by the circumstances affecting the work, and should provide the rationale for the decision made with respect to the inclusion or exclusion of margins. [Effective February 1, 2018]

.03 Where a public personal injury compensation plan has an established practice of providing ad hoc increases to benefits, or a periodic update to rates or tables used in the administration of the plan, the actuary should recognize such established practice when valuing the benefits liabilities by assuming the continuation of such practice, unless a definitive policy decision to discontinue such established practice has been taken by the plan. [Effective February 1, 2018]

### **5430 Economic assumptions**

- .01 The needed economic assumptions include the expected rate of investment income, the expected investment expenses and, depending on the benefit being valued, one or more of
- expected rate of general inflation,
  - expected rate of health care cost inflation,
  - expected rate of wage inflation,
  - if different, expected earnings increase specific to wage loss benefits, and
  - expected rate of change of any other economic factor that may be applicable.
- .02 The economic assumptions that are needed would depend on the nature of the benefits that are being valued, and may vary by year.
- .03 The actuary would develop and disclose separate nominal assumptions, but may prefer to complete the calculations using rates that are net of inflation, net of expenses or net of some other factor. Such calculations may, however, be approximations.



- .04 When determining the best estimate assumption for the expected rate of investment income, the actuary would take into account the expected pattern of risk-free rates of return, the expected additional investment return on the assets of the public personal injury compensation plan at the calculation date (if any) and the expected investment policy after that date. The expected additional investment return would depend on one or more of
- additional returns over risk-free rates expected to be earned on non-risk-free fixed income assets of the type and quality owned on the reporting date and expected to be acquired pursuant to the investment policy of the plan,
  - additional returns over risk-free interest rates expected to be earned on other types of investments, including publicly traded common or preferred equities, private placements, real estate and private equity, and
  - projected composition of the investment portfolio in future years.

In establishing the assumption for the expected rate of investment income, the actuary would assume that there would be no additional returns achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy except to the extent that the actuary has reason to believe, based on relevant supporting data, that such additional returns will be consistently and reliably earned over the long term.

- .05 The expected investment expenses would depend on the investment policy of the plan and the types of investments held and projected to be held in future.
- .06 The actuary may adopt an assumption for the expected rate of investment income that varies depending on the part of the public personal injury compensation plan being valued, and the assets backing the liabilities in that part.
- .07 The assumed expected rate of investment income need not be a flat rate but may vary from period to period.

#### **5440 Non-economic assumptions**

- .01 When setting non-economic assumptions, the actuary would reflect all material contingencies.
- .02 The actuary would recognize the effect of varying experience and settlement patterns that result from definitive or virtually definitive revisions to the plan's benefits or claims practices and would consider the relevance of historical claims experience.

- .03 When setting the assumptions for wage loss, disability, pension and other benefits, the actuary would take into account all applicable material contingencies, including the possibility of recoveries, relapses, mortality improvements, changing benefit levels and the intermittence of income replacement and rehabilitation benefits throughout the lifetime of claimants. Further, the actuary would consider the potential effect on future benefit payments of factors such as changing economic conditions, employment levels, the claimant's occupation and industry and seasonal variations.

#### **5450 Margins for adverse deviations**

- .01 The actuary should not include a margin for adverse deviations when the circumstances affecting the work require a best estimate calculation or an unbiased calculation. [Effective February 1, 2018]
- .02 The actuary should include margins for adverse deviations when the circumstances affecting the work require such margins. A non-zero margin should be sufficient, without being excessive, and should have the effect of increasing the benefits liabilities or reducing the reported value of the offsetting assets, the computation of which falls within the scope of the work of the actuary. In addition, the provision resulting from the application of all margins for adverse deviations should be appropriate in the aggregate. [Effective February 1, 2018]
- .03 If the actuary is required by legislation, regulation, accounting standards, the accounting policy or the funding policy of the plan to use a margin for adverse deviations that is outside the range that the actuary considers appropriate, the actuary may use such imposed assumption, but the actuary should disclose that the margin is outside of the appropriate range and disclose the reason for using such margin. [Effective February 1, 2018]
- .04 Examples of situations where the circumstances affecting the work might require an unbiased calculation include
- legislation governing the plan may require an unbiased calculation,
  - the relevant accounting standards or the accounting policy of the public personal injury compensation plan may require the use of best estimate assumptions, or
  - the plan's funding policy may recognize the monopoly nature of the plan and place a high priority on equity among generations, employers and other groups, and hence require the use of best estimate assumptions.

- .05 Examples of situations where the circumstances affecting the work might require the inclusion of a margin for adverse deviations include
- where the relevant accounting standards or the accounting policy of the plan, or its funding policy, require inclusion of a margin for adverse deviations, or
  - where the level of uncertainty or volatility may be high, and not considered to be sufficiently mitigated by the underlying adaptability of the plan.
- .06 Where the actuary includes a margin for adverse deviations, the actuary would provide the rationale for inclusion of the margin and for the selection of the specific amount of the margin. The rationale may include considerations such as
- funding policy or accounting policy of the public personal injury compensation plan,
  - relative importance placed on the balancing of competing interests compared to the achievement of full funding,
  - level of uncertainty inherent in the assumptions,
  - level of reliability or credibility of the data or historical information upon which the assumptions are based,
  - asset/liability mismatch risk,
  - propensity for ad hoc changes to be made to plan conditions, and
  - legislative or other restrictions on the ability to mitigate past losses.

### 5460 Sensitivity testing

- .01 The actuary should perform sensitivity testing of adverse scenarios, to illustrate and aid the understanding of the effect of adverse changes to assumptions. [Effective February 1, 2018]

- .02 The adverse scenarios that the actuary tests should include at least
- a decrease of 100 basis points in the assumed rate of investment earnings in all future years,
  - an increase of 100 basis points in the assumed general rate of inflation,
  - a discount rate that is equal to the expected rate of return earned on a hypothetical fixed income portfolio, consisting of high-quality bonds of pertinent durations. [Effective February 1, 2018]
- .03 The actuary would consider testing other scenarios, depending on the plausible material risks to which the plan may be exposed.
- .04 The actuary may also perform sensitivity testing of favourable scenarios.
- .05 When selecting the assumptions and scenarios for sensitivity testing, the actuary would consider the circumstances affecting the work, and would select those assumptions that have a material impact on the benefits liabilities. The actuary may consider the use of testing of integrated sensitivity scenarios, for example, the effect of a deep and prolonged recession.

## 5500 Other related items

- .01 The actuary should compute, separately from the benefits liabilities, the present value on the reporting date of any future assessments that have been specifically earmarked to amortize a current deficit and any future scheduled reductions to assessments that have been specifically identified to reduce a current surplus, in accordance with the circumstances affecting the work. [Effective February 1, 2018]
- .02 Where the public personal injury compensation plan has specifically earmarked a defined portion of specified future assessments to amortize a current deficit, the actuary would determine the actuarial present value of such earmarked assessments, and disclose such amount separately from the benefits liabilities and assets of the plan, provided that such disclosure is in accordance with the terms of the engagement.
- .03 Where the public personal injury compensation plan has specifically identified reductions to future assessments to reduce a current surplus, the actuary would estimate the actuarial present value of such reductions to future assessments, and disclose such amount separately from the benefits liabilities and assets of the plan, provided that such disclosure is in accordance with the terms of the engagement.

## 5600 Gain and loss analysis

- .01 The actuary should conduct a gain and loss analysis, including a comparison of actual and expected experience for the period between the prior calculation date and the current calculation date. [Effective February 1, 2018]
- .02 The actuary should also conduct a reconciliation of the surplus or deficit position of the plan, provided that such reconciliation is in accordance with the terms of the engagement. [Effective February 1, 2018]
- .03 The actuary's analysis would include all material gains and losses. At a minimum, the actuary's gain and loss analysis would consider the impact of any significant changes to the assumptions or methods used, any significant changes to the benefits or policies of the plan, gains or losses due to investment returns on the plan's assets, legislative changes, and any other areas where the difference between actual and expected experience is significant.
- .04 The actuary would report a change in assumption if the current assumption differs nominally from the corresponding prior assumption, unless the change in the nominal amount results from the application of the same calculation method. For example, if certain rates used in the valuation are based on historical claims experience and calculated using the same averaging formula, the difference in assumed rates between the calculation date and the prior calculation date would not normally be considered as a change in assumptions. Nevertheless, the actuary may choose to disclose the effect of the updated rate assumption on the valuation results.

## 5700 Reporting

- .01 For work pursuant to this part, the actuary should prepare a report that
- states the calculation date and the prior calculation date,
  - identifies the legislation or other authority under which the work is completed,
  - describes any significant terms of the appropriate engagement that are material to the actuary's work, including the purpose of the work,
  - describes the sources of data, benefit provisions and policies used in the work, and any limitations thereon,
  - summarizes the data used for the valuation, the data tests conducted to assess the accuracy and completeness of the data used in the work, and issues regarding insufficient or unreliable data,
  - describes the plan's benefits, significant policies and relevant administration practices, including the identification of any amendments made since the prior calculation date, and the effect of such amendment on the benefits liabilities,
  - describes any pending definitive or virtually definitive amendment, policy change or change to administration practice, confirms whether or not such amendment or change has been reflected in the benefits liabilities, and identifies the effect of such amendment or change on the benefits liabilities,
  - identifies any significant changes to the relevant statute, strategic direction or management policy, or any significant appeal decision that changes management policy or practice, since the prior calculation date and the consequent effect on the benefits liabilities,
  - summarizes the benefits liabilities,
  - states that there is no provision for adverse deviations, where that is the case,
  - discloses any imposed margins that the actuary has used in accordance with paragraph 5450.03 that, in the opinion of the actuary, are outside of the appropriate range,
  - reports the aggregate provision for adverse deviations included in the benefits liabilities,

- describes the treatment of liabilities for self-insured employers,
- discloses subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no significant events of which the actuary is aware, include a statement to that effect,
- describes and quantifies the gains and losses between the prior calculation date and the current calculation date, and provides an analysis and explanation of the significant gain and loss items, and
- describes the treatment of the liabilities for occupational disease claims, and states either that the amount of the benefits liabilities includes an appropriate allowance for potential occupational disease claims that are expected to arise after the calculation date as a result of exposures in the workplace prior to the calculation date or, if such is the case for calculation dates preceding December 31, 2014, that the amount of the benefits liabilities excludes such an allowance. [Effective February 1, 2018]

.02 Depending on the terms of the engagement, the report should

- describe the sources of information on the plan's assets,
- describe the plan's assets, including their market value, the methods and assumptions used to value the assets and a summary of the assets by major category,
- report the financial position at the calculation date, and
- report the actuarial present value of any future assessments earmarked to amortize a current deficit or of any reductions in future assessments intended to reduce a current surplus. [Effective February 1, 2018]

.03 If the report does not include the results of the sensitivity testing that was completed, the actuary should prepare a separate report for the management of the public personal injury compensation plan that does include such sensitivity testing results. [Effective February 1, 2018]



.04 The report should provide the following five statements of opinion, all in the same section of the report and in the following order

- a statement regarding data, which would usually be, “In my opinion, the data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”,
- a statement regarding assumptions, which would usually be, “In my opinion, the assumptions are appropriate for the purpose of the valuation.”,
- a statement regarding methods, which would usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose of the valuation.”,
- a statement regarding appropriateness, which would usually be “In my opinion the amount of the benefits liabilities makes appropriate provision for all personal injury compensation obligations and the financial statements fairly present the results of the valuation.”, and
- a statement regarding conformation, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.” [Effective March 15, 2011]

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

.06 The circumstances affecting the work may result in a deviation from accepted actuarial practice in Canada. For example, the applicable legislation or the terms of the engagement may require that the actuary use a margin for adverse deviations that is outside the range that the actuary considers appropriate, or require that the actuary exclude the benefits liabilities in respect of certain occupational disease claims. In such case, the actuary would disclose such deviation in the report.

## **6000 – Post-Employment Benefit Plans**

## Table of Contents

<b>6100</b>	<b>Scope .....</b>	<b>6003</b>
<b>6200</b>	<b>Advice on the Funding, Funded Status, Financial Condition, or Financial Position of a Post-Employment Benefit Plan .....</b>	<b>6006</b>
6210	General .....	6006
6220	Advice on Funding or Funded Status .....	6012
6230	Reporting: External User Report .....	6014
<b>6300</b>	<b>Full or Partial Wind-up Valuation .....</b>	<b>6019</b>
6310	General .....	6019
6320	Reporting: External User Report .....	6022
<b>6400</b>	<b>Financial reporting of Post-Employment Costs .....</b>	<b>6028</b>
6410	General .....	6028
6420	Reporting: External User Report .....	6031

## 6100 Scope

.01 The standards in part 6000 apply as follows:

- Section 6200 applies to advice that an actuary provides regarding the funding, funded status, financial position, or the financial condition with respect to a post-employment benefit plan, except where such advice relates to items covered by section 6300 or section 6400;
- Section 6300 applies to advice that an actuary provides regarding the funding, funded status, financial position, or the financial condition with respect to the wind-up, in full or in part, of a post-employment benefit plan; and
- Section 6400 applies to advice that an actuary provides regarding financial reporting of a post-employment benefit plan's costs and obligations in the employer's financial statements, or the post-employment benefit plan's financial statements, or the financial statements of a trust associated with the post-employment benefit plan, where the calculations and advice are provided in accordance with an applicable financial reporting standard.

For the purposes of determining whether section 6300 applies, the wind-up of a post-employment benefit plan would involve the termination of future benefits for some or all plan members, the termination of some or all plan benefits and the distribution of some or all of the plan's assets, if any. Examples of work with respect to wind-ups include the calculation of benefit plan costs or entitlements:

- When a benefit trust is being replaced with an insured arrangement;
- Where assets from a company's liquidation may be provided as cash in lieu of employee benefit plans upon insolvency or upon the wind-up of a post-employment benefit plan trust; and
- Where the plan sponsor offers cash in lieu of future benefits.

The cessation of benefit accruals or termination of a post-employment benefit plan, not involving the termination of plan benefits and distribution of plan or other assets, would not constitute a plan wind-up. For example, the closure of a post-employment benefit plan to future new members would not constitute a wind-up.

- .02 The standards in sections 6200 through 6400 apply to an actuary's advice with respect to a post-employment benefit plan that provides benefits other than pension benefits 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. Such plans include any arrangement that provides:
- Long-term employee benefits (and compensated absences) including long-service leave or sabbatical leave, jubilee or other long-service benefits, long-term disability benefits, and profit sharing, bonuses, and other deferred compensation such as retiring allowances that are to be paid far enough into the future to be considered to be a post-employment benefit (long-term employee benefits would generally include benefits that commence or continue to be payable more than 12 months after the initial incident that caused the benefit to be paid; for example, long-term disability benefits);
  - Short-term employee benefits (and compensated absences) that accumulate or vest, such as accumulated sick days or vacation days that can be saved in one period and drawn or paid out in another period;
  - Benefits to which plan members become entitled when they are no longer actively at work, such as post-employment life insurance or post-employment health care; and/or
  - Termination benefits payable to an employee as a result of termination of employment, if some or all of the benefits are payable on or after the date of termination of employment.
- .03 The standards in sections 6200 through 6400 do not apply to an actuary's advice with respect to any arrangement that is:
- A plan within the scope of part 3000 Pension Plans, part 5000 Public Personal Injury Compensation Plans, or part 7000 Social Security Programs;
  - A short-term employee benefit plan such as wages, salaries, and social security contributions, paid annual vacation/leave and paid sick leave, profit sharing and bonuses (if payable within 12 months of the end of the period to which they relate) and non-monetary benefits (such as medical care, housing, cars, and free or subsidized goods or services) for current employees that do not accumulate or vest;
  - A post-employment benefit plan whose benefits are all guaranteed by a life insurer; or
  - A social security program such as the Canada Pension Plan and Québec Pension Plan.

- .04 The standards in sections 6200 through 6400 also apply to an actuary's advice to an employer with respect to the self-insured element of a public personal injury compensation plan that covers the employees of that employer; for example, self-insured workers' compensation plans.
- .05 An actuary's advice with respect to a post-employment benefit plan may relate to items such as:
- Required or recommended funding of the plan;
  - Projected cash flows of the plan with or without future new entrants;
  - Determination of the actuarial present value of the projected or accrued benefits of the plan with or without future new entrants;
  - Determination of amounts for financial reporting of a plan's cost; or
  - Determination of the obligations for reporting in the employer's financial statements, or the plan's financial statements, or the financial statements of a trust associated with the plan.

## **6200 Advice on the Funding, Funded Status, Financial Condition, or Financial Position of a Post-Employment Benefit Plan**

- .01 This section 6200 applies to advice that an actuary provides regarding the funding, funded status, financial position, or the financial condition with respect to a post-employment benefit plan, except where such advice is with respect to:
- The wind-up, in full or in part, of a post-employment benefit plan; or
  - The financial reporting of a post-employment benefit plan's costs and obligations in the employer's financial statements, or the post-employment benefit plan's financial statements, or the financial statements of a trust associated with the post-employment benefit plan, where the calculations and advice are provided in accordance with an applicable financial reporting standard.

### **6210 General**

- .01 The actuary's advice with respect to a post-employment benefit plan should take account of the circumstances affecting the work. [Effective February 1, 2018]
- .02 The actuary should select an actuarial cost method that is consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .03 The actuary should select an asset valuation method, where applicable, that is consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .04 The actuary's advice with respect to a post-employment benefit plan should take account of the post-employment benefit plan's benefit provisions at the calculation date, except that the actuary may reflect a pending amendment to the post-employment benefit plan that increases the value of its benefits. [Effective June 30, 2013]
- .05 The actuary's advice with respect to a post-employment benefit plan should take account of all relevant data, including historical claims experience. [Effective June 30, 2013]
- .06 The actuary should select assumptions that are consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .07 The actuary should determine the next calculation date and the actuary's advice should cover at least the period between the calculation date and the next calculation date. [Effective June 30, 2013]

### **Circumstances affecting the work**

- .08 For the purposes of section 6200, the circumstances affecting the work would include:
- The terms of the appropriate engagement under which the work is being performed; and
  - The application of the law to the work.
- .09 The terms of an appropriate engagement would specify whether the actuary's advice relates to:
- The funded status or the funding of the post-employment benefit plan or a combination thereof;
  - The calculation of the actuarial present value of future benefits payable from a post-employment benefit plan;
  - The calculation of the expected future cash flows from a post-employment benefit plan; or
  - Other financial information with respect to the post-employment benefit plan that is actuarial in nature.
- .10 The terms of an appropriate engagement may specify the use of a particular actuarial cost method and/or a particular asset valuation method.
- .11 The terms of an appropriate engagement may specify that the actuary's advice may be related to the entire plan, or to a portion of the plan, or to a selected group of members only.

### **Actuarial cost methods**

- .12 Actuarial cost methods include, among others:
- Cost allocation methods, which allocate the actuarial present value of projected benefits among time periods, including 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 a portion of the actuarial present value of projected benefits to a time period, including the accrued benefit actuarial cost method, the unit credit actuarial cost method, and the projected unit credit actuarial cost method; and
  - Forecast actuarial cost methods, which allocate a portion of the actuarial present value of projected benefits to the forecast period based on:
    - The actuarial present value, at the calculation date, of projected benefits at the end of the forecast period, including, if appropriate, benefits for those who are expected to become members between the calculation date and the end of the forecast period;



minus

- The actuarial present value of projected benefits at the calculation date;

plus

- The actuarial present value, at the calculation date, of benefits expected to be paid during the forecast period.

### Asset valuation methods

- .13 If the plan has assets, the use of an asset valuation method that produces an asset value different from market value may be appropriate depending on the circumstances affecting the work. For example, the use of a smoothed asset value may be appropriate to moderate the volatility of contribution rates for purposes of advice on funding.
- .14 The value of assets may be, subject to specific requirements for different types of valuation, any of:
- Their market value;
  - Their market value adjusted to moderate volatility in investment returns;
  - 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.

### Plan provisions

- .15 The actuary would determine the plan provisions with sufficient accuracy for the purposes of the valuation. Sources of information on plan provisions include:
- Current plan documents;
  - Funding or underwriting arrangements;
  - Collective bargaining agreements;
  - Information regarding past practices;
  - Cost-sharing arrangements between the plan sponsor(s) or plan administrator and plan members; and
  - Communication between the plan sponsors or plan administrator and the plan members.

Prior plan provisions may be needed to analyze claims information from periods prior to the calculation date.

- .16 The actuary would consider all benefits that are to be payable under the post-employment benefit plan and would include provision for all such benefits expected to be paid under the plan.

### **Anticipated amendment or deferred recognition of a pending amendment**

- .17 The actuary's advice on a post-employment benefit plan may, subject to disclosure, reflect an expected amendment to the plan if the amendment is definitive or virtually definitive, and the amendment increases the plan's benefits. For example, the plan sponsor may have a regular pattern of increasing the dental fee guide schedules that the post-employment benefit plan uses for its benefit limit. The actuary's advice would normally reflect continued adoption of such increased limits.
- .18 If, at the calculation date, an amendment to the post-employment benefit 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 the effective date may disregard the amendment, but the advice on funding after the effective date would take the amendment into account; or
  - If the effective date of the amendment is after the period for which the report gives advice on funding, then the advice on funding may disregard the amendment.
- .19 The effective date of the amendment is the date at which the amended benefits take effect, as opposed to the date when the amendment becomes either definitive or virtually definitive.
- .20 If an actuary is aware of an expected amendment to the post-employment benefit plan, but does not reflect the amendment in the work, then the actuary would report the event in accordance with the requirements for the disclosure of subsequent events.

### **Data**

- .21 In addition to the current plan membership and asset data, if relevant, the actuary would collect information on historical claims experience, such as nature of absence and benefit levels. Data may come from the plan sponsor or plan administrator or other sources, such as insurance carriers, brokers, or external third-party plan administrators.
- .22 In identifying the data needed, the actuary would bear in mind the pertinent benefits (e.g., those applicable during retirement, disability, or following termination of employment). If applicable, the actuary may obtain claims data split by plan, by age, by location, by status (retiree, inactive, spouse, etc.) and by type of expense (drug, hospital, payment for loss of income, etc.).

- .23 Where appropriate, in analyzing any relevant historical claims data, the data would be adjusted to reflect the trend in the cost of benefits between the reference period and the calculation date. Where appropriate, the actuary would also adjust past experience results to reflect non-recurring influences such as changes in the benefits offered, significant changes in the demographics of the group, changes in government programs, or unusual claims.
- .24 Available data may have limited value or 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 other members or other sources of data that the actuary considers reasonable and relevant. Such other data would be adjusted appropriately for the expected differences between these groups and the group from which the data were drawn.
- .25 The actuary may project data, including membership data and data with respect to claim costs from the effective date of the data to the calculation date, using appropriate extrapolation techniques. The actuary would not normally extrapolate membership data more than three years from the effective date of the membership data. The actuary may also use recent credible claims experience in the extrapolation.

#### **Assumptions**

- .26 In establishing the assumptions, 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 present alternative results reflecting different scenarios of the future. If the purpose of the valuation is such that the effect of anticipated future government changes is to be taken into account, the actuary would make appropriate assumptions in respect thereof.
- .27 In determining claim costs assumptions, where necessary, the actuary would consider available claims experience with regards to items such as:
- Claimant age, member status, coverage category, and benefit type;
  - Credibility; and
  - Relevance to future periods and future benefit provisions.

- .28 The assumption with respect to the future claims trend rate, where necessary, may be divided into short-term and longer-term components. The short-term component would often be based on the level experienced in the recent past by the plan and plan members. The longer-term component would be consistent with the assumption regarding future changes in benefit programs and general economic conditions such as nominal Gross Domestic Product growth. The actuary would determine the period of time required to transition from the short-term trends to the longer-term trends and when the short-term trends may need to be revised.
- .29 In situations where there is not sufficient data with respect to claim costs—for example if the post-employment benefit plan has only a small number of members or does not yet have any members in payment status—the actuary may develop the applicable assumptions based on experience with other similar plans.

**Discount rate**

- .30 For post-employment benefit plans that are not funded, in selecting the best estimate assumption for the discount rate, the actuary would reflect the yields on fixed income investments, considering the expected future benefit payments of the plan and the circumstances affecting the work.

**Expenses**

- .31 The actuary's advice on a post-employment benefit plan would take account of expenses, including whether or not they are expected to be paid from the post-employment benefit plan's assets, if any.
- .32 The actuary would consider, as part of the claims experience, the administration costs related to the adjudication of the claims including any related general administration expenses charged by the party adjudicating the claims and all applicable taxes. The actuary would also consider other expenses related to the post-employment benefit plan.

**Next calculation date**

- .33 The next calculation date is the latest date for which the actuary considers the advice with respect to a post-employment benefit plan to be applicable. The actuary would take into consideration the terms of an appropriate engagement in determining the next calculation date, but the next calculation date would not normally be more than three years after the current calculation date.

## 6220 Advice on Funding or Funded Status

.01 If the actuary is providing advice with respect to the funding and/or funded status of a post-employment benefit plan that is pre-funded in some manner, the actuary should select either best estimate assumptions or best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, required by the terms of an appropriate engagement.  
[Effective February 1, 2018]

- .02 Advice on funding or funded status may include:
- Advice regarding the amount of assets to be earmarked, whether or not segregated, to cover post-employment benefit commitments;
  - Advice regarding a systematic method of accumulating funds to provide the post-employment benefit commitments; or
  - Advice on the funding implications of a plan amendment.
- .03 The terms of an appropriate engagement may specify applicable objectives of funding, which may include a formal or informal funding policy.
- .04 Objectives of funding specified by the terms of an appropriate engagement may include considerations such as the security of benefits and related provisions for adverse deviations, the allocation of contributions among time periods, and/or inter-generational equity.
- .05 Depending on the circumstances affecting the work, the actuary's advice on funding may describe a range of contributions.

### Discount rate

- .06 If the actuary's advice relates to the funding or funded status of a post-employment benefit plan, in selecting the best estimate assumption for the discount rate, the actuary may either:
- Take into account the expected investment return on the assets, if any, of the post-employment benefit plan at the calculation date and the expected investment policy after that date; or
  - Reflect the yields on fixed income investments, considering the expected future benefit payments of the post-employment benefit plan and the circumstances affecting the work.

- .07 In establishing the discount rate assumption, the actuary would assume that there will be no additional returns achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy except to the extent that the actuary has reason to believe, based on relevant supporting data, that such additional returns will be consistently and reliably earned over the long term.

## 6230 Reporting: External User Report

- .01 An external user report on work pursuant to section 6200 should:
- Describe any significant terms of the appropriate engagement that are material to the actuary's advice;
  - Include the calculation date, the report date, and the next calculation date, if applicable;
  - Describe the sources of membership data, plan provisions, the post-employment benefit plan's assets, if any, and historical claims data, if any, and the dates at which they were compiled;
  - Describe the membership data and any limitations thereof, and any assumptions made about missing or incomplete membership data;
  - Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
  - Describe the assets, if any, including their market value and a summary of the assets by major category;
  - Describe the post-employment benefit plan's provisions, including the identification of any pending definitive or virtually definitive amendment of which the actuary is aware, and the manner in which any such amendments have been reflected in the actuary's advice;
  - Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
  - State the type of valuation undertaken under the terms of the appropriate engagement;
  - For any one valuation undertaken, describe and quantify the gains and losses between the prior calculation date and the calculation date;
  - For any one valuation undertaken, report the effect on the key results of the valuation of using a discount rate 1.0% lower than that used for the valuation; and
  - For any one valuation undertaken, where relevant, report the effect on the key results of the valuation of using an assumed future claims trend rate 1.0% higher than that used for the valuation. [Effective February 1, 2018]

- .02 For each valuation undertaken by the actuary, the external user report should:
- If there is no provision for adverse deviations, include a statement to that effect;
  - Describe the claims administration expenses or other plan expenses that are included in the work; and
  - Report the results of the valuation. [Effective March 31, 2015]
- .03 An external user report that provides advice on funding should:
- Describe the rationale for any assumed additional returns, net of investment management expenses, from an active investment management strategy, included in the discount rate assumption;
  - Describe the determination of contributions or a range of contributions between the calculation date and the next calculation date; and
  - If contributions are fixed by the terms of the post-employment benefit plan or other governing documents (e.g., a collective agreement), then either:
    - Report that the contributions are adequate to fund the post-employment benefit plan in accordance with its terms; or
    - Report that the contributions are not adequate to fund the post-employment benefit plan in accordance with its terms; and
      - Describe the contributions required to fund the post-employment benefit plan adequately in accordance with its terms;
      - Describe one or more possible ways in which benefits may be reduced such that the contributions would be adequate to fund the post-employment benefit plan in accordance with its terms; or
      - Describe a combination of increases in contributions and reductions in benefits that would result in the funding being in accordance with its terms. [Effective June 30, 2013]



- .04 An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:
- A statement regarding membership data, which should usually be, “In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
  - A statement as to assumptions, which should usually be, “In my opinion, the assumptions are appropriate for the purpose(s) of the valuation(s).”;
  - A statement as to methods, which should usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose(s) of the valuation(s).”; and
  - A statement as to conformity, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.” [Effective June 30, 2013]
- .05 An external user report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation. [Effective June 30, 2013]

#### **Significant terms of appropriate engagement**

- .06 Significant terms of the appropriate engagement may include matters such as:
- The use of a specified actuarial cost method;
  - The use of a specified asset valuation method, where applicable;
  - The exclusion of benefits for purposes of a valuation;
  - The extent of margins for adverse deviations, if any, to be included in selecting assumptions; and
  - The funding policy, which may include pay-as-you-go funding.

#### **Membership data**

- .07 The actuary would describe any assumptions and methods used in respect of insufficient or unreliable membership or census/employee data.
- .08 The actuary may describe limitations on the tests conducted in the review of the data which has been determined to be sufficient and reliable for purposes of the valuation(s). For example, the actuary may describe that the data tests will not capture all possible deficiencies in the data and reliance is also placed on the certification of the plan sponsor or plan administrator as to the quality of the data.

### Methods

- .09 For each valuation included in the external user report for which there was a prior valuation, the description of the actuarial cost method would include a description of any change to the actuarial cost method used in the prior valuation and the rationale for such change.
- .10 For each valuation included in the external user report for which there was a prior valuation, the description of the method to value the assets, if any, would include a description of any change to the asset valuation method used in the prior valuation and the rationale for such change.

### Types of valuations

- .11 An external user report with respect to a post-employment benefit plan would normally include information on only one valuation, which is typically a going concern valuation. To the extent that the external user report provides information with respect to multiple valuations, the actuary would include information with respect to the types of valuations required by the circumstances affecting the work.

### Assumptions

- .12 For each valuation included in the external user report for which there was a prior valuation, the description of assumptions would include a description of any changes to the assumptions used in the prior valuation.
- .13 For each valuation included in the external user report, the description of the assumptions would, if appropriate for the circumstances affecting the work, describe:
- The development of the assumed claim costs;
  - The claims experience information used to develop the assumed claim costs; and
  - The extent to which the claims experience information has influenced the selection of the assumed future cost trend rates.

### Relevant results of the valuation

- .14 The results of the valuation will depend on the purpose(s) of the valuation and the circumstances affecting the work. The results of the valuation may include such information as:
- The present value of projected benefits;
  - The present value of projected benefits allocated to periods up to the calculation date;
  - The projected cash flows; and/or
  - The service cost for periods following the calculation date.

### **Reporting gains and losses**

- .15 The reported gains and losses for a valuation would include the gain or loss due to a change in the actuarial cost method or a change in the method for valuing the assets, if any, and each significant change in assumptions and plan provisions determined at the calculation date. If an amendment to the post-employment benefit plan prompts the actuary to change the assumptions, the actuary may report the combined effect of the amendment and the resultant change in assumptions.

### **Sensitivity analysis**

- .16 When following the recommendations to illustrate the effect of a change in discount rate, trend rate or other assumption on a valuation, the actuary would maintain all other assumptions and methods as used in the underlying valuation.

### **Reference to other reports**

- .17 The disclosures required in the external user report may be incorporated by reference to another actuarial valuation report prepared in accordance with accepted actuarial practice with the same calculation date.

### **Statements of opinion**

- .18 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.
- .19 While a separate statement regarding assumptions would usually be included in respect of each purpose of the valuation, the statements regarding assumptions may be combined where the statements do not differ among some or all of the valuation's purposes. The report would indicate clearly which statement regarding assumptions applies to each of the valuation's purposes.
- .20 While a separate statement regarding methods would usually be included in respect of each purpose of the valuation, the statements regarding methods may be combined where the statements do not differ between some or all of the valuation's purposes. The report would indicate clearly which statement regarding methods applies to each of the valuation's purposes.

## 6300 Full or Partial Wind-up Valuation

- .01 This section 6300 applies to advice that an actuary provides with respect to the wind-up (termination of future benefits for some or all members, the termination of some or all plan benefits, and the distribution of some or all of the plan's assets, if any), in full or in part, of a post-employment benefit plan. Examples of work with respect to wind-ups include the calculation of benefit plan costs or entitlements:
- When a benefit trust is being replaced with an insured arrangement;
  - Where assets from a company's liquidation may be provided as cash in lieu of employee benefit plans upon insolvency or upon the wind-up of a post-employment benefit plan trust; and
  - Where the plan sponsor offers cash in lieu of future benefits.
- .02 This section 6300 does not apply in situations where the post-employment benefit plan is no longer available for future members but accrued benefits are not being settled.

### 6310 General

- .01 The actuary's advice with respect to a post-employment benefit plan that is being wound up, in full or in part, should take account of the circumstances affecting the work, and assume the plan is being wound up at the calculation date. [Effective February 1, 2018]
- .02 The actuary should take account of subsequent events up to the cut-off date. [Effective June 30, 2013]
- .03 The post-employment benefit plan's assets, if any, should be valued at liquidation value. [Effective June 30, 2013]
- .04 The actuary should take account of the post-employment benefit plan's benefit provisions at the calculation date, except that the actuary may reflect a pending amendment to the post-employment benefit plan. [Effective June 30, 2013]
- .05 The actuary's advice with respect to a post-employment benefit plan should take account of all relevant data, including historical claims experience. [Effective June 30, 2013]

- .06 The actuary should select assumptions that:
- Are either best estimate assumptions or are best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, required by the terms of an appropriate engagement;
  - Are selected as at the cut-off date; and
  - Reflect the expected method of benefit settlement. [Effective February 1, 2018]
- .07 Unless it is expected that expenses will not be paid from the post-employment benefit plan's assets, the actuary should select an explicit assumption regarding the expenses of wind-up and either offset the resulting expense provision against the post-employment benefit plan's assets, if any, or add the resulting expense provision to the post-employment benefit plan's liabilities. Expenses may include administration costs (which may be incurred from a third-party administrator or an insurer), or other expenses. [Effective June 30, 2013]

### **Scope**

- .08 This section does not prescribe the manner in which:
- Benefit entitlements would be determined;
  - Funding obligations would be determined; or
  - The post-employment benefit plan's assets, if any, would be allocated between the employer(s) and the members or among members themselves.
- .09 Rather, those issues would be determined in accordance with the law, the plan provisions or governance documents, or by an entity empowered thereunder to make that determination. It may be appropriate, however, to use the results of the valuation to address one or more of those issues, or to disclose their resolution in the report.

### **Circumstances affecting the work**

- .10 For the purposes of section 6300, the circumstances affecting the work would include:
- Whether the actuary's advice relates to the funding, funded status, financial position, or the financial condition of the post-employment benefit plan, or a combination thereof;
  - Whether the actuary's advice relates to the present value of expected future benefits under the post-employment benefit plan;
  - The terms of the appropriate engagement under which the work is being performed; and
  - The application of the law to the work.

### **Cut-off date**

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

### **Partial wind-up**

- .12 A partial wind-up occurs when a subset of the members terminates membership in circumstances that require wind-up with respect to those members. Such wind-up does not apply to the continuing members, although it may also be necessary, for other reasons, to value the benefits of the continuing members.
- .13 The standards for a partial wind-up are the same as the standards for a full wind-up.

### **Assumptions**

- .14 The selection of the assumptions would normally be determined in accordance with the law (if applicable), the plan provisions or governance documents, or by an entity empowered thereunder to make that determination.
- .15 The actuary may need to consider various appropriate tax treatments for calculations prepared for wind-ups of post-employment benefit plans.

### **Expenses**

- .16 The actuary would consider as part of the claims experience the administration costs related to the adjudication of the claims, including any related general administration expenses charged by the party adjudicating the claims and all applicable taxes. The actuary may also consider other expenses related to the post-employment benefit plan.

### **Plan provisions**

- .17 The actuary would determine the plan provisions with sufficient accuracy for the purposes of the valuation. Sources of information on plan provisions include:
- Current plan documents;
  - Funding or underwriting arrangements;
  - Collective bargaining agreements;
  - Information regarding past practices;
  - Cost-sharing arrangements between the plan sponsor(s) or plan administrator and plan members; and
  - Communication between the plan sponsors or plan administrator and the plan members.

Prior plan provisions may be needed to analyze claims information from periods prior to the calculation date.

- .18 The actuary would consider all benefits that are to be payable under the post-employment benefit plan and would include provision for all such benefits expected to be paid under the plan.

### **6320 Reporting: External User Report**

- .01 If a previous external user report was prepared with respect to the wind-up, the actuary should describe and quantify the gains and losses between the prior calculation date and the calculation date. [Effective June 30, 2013]
- .02 An external user report should:
- Include the wind-up date, the calculation date, the cut-off date, and the report date;
  - Describe the events precipitating the wind-up, of which the actuary is aware, that affect the terms of the wind-up, the benefit entitlements, or the valuation results;
  - Describe the sources of membership data, plan provisions, and the post-employment benefit plan's assets, if any, and historical claims data, if any, and the dates at which they were compiled;
  - Describe the membership data and any limitations thereof, including any assumptions made about missing or incomplete membership data;
  - Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
  - Subject to any applicable privacy legislation:
    - Include the detailed individual membership data; or
    - Include an offer to provide detailed individual membership data on request to the plan sponsor or the plan administrator;
  - Describe the liquidation value of the assets, if any, and a summary of the assets by major category;
  - Describe the post-employment benefit plan's provisions, including an identification of:
    - Any amendments made since any previous external user report with respect to the plan which affect benefit entitlements; and

- Any subsequent events or post-wind-up contingent events, of which the actuary is aware, which affect benefit entitlements;
- Report the explicit assumption regarding the expenses of wind-up or justify the expectation that expenses will not be paid from the post-employment benefit plan's assets, if any;
- Report the funded status at the calculation date, and state whether an updated report will be required in the future;
- If applicable, report the settlement value for each plan member when settlement is to be made by cash payments to the member;
- Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work and, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
- State that the funded status at settlement may differ from that contained in the report, unless the report includes the funded status at the time of final settlement;
- If the actuary relies upon direction concerning unclear or contentious issues:
  - Describe each such issue;
  - Describe the direction relied upon or, where appropriate, a summary thereof; and
  - Identify the person providing such direction and the basis of authority of such person;
- Describe any post-wind-up contingent events that may affect the distribution of the post-employment benefit plan's assets, if any;
- Describe whether a recalculation of the value of benefit entitlements is required at settlement;
- Where a member has a choice of settlement options that the member has not yet made, describe the assumptions made regarding such choice;
- If applicable, describe the method to allocate the post-employment benefit plan's assets among classes of members and the method to distribute surplus;



- Describe the actuary's role in calculating settlement values, including the assumptions and methods used for their calculation; and
  - Describe the sensitivity of the valuation results to the post-employment benefit plan's investment policy and to market conditions between the report date and the settlement date. [Effective February 1, 2018]
- .03 An external user report should include the following four statements of opinion, all in the same section of the report and in the following order:
- A statement regarding membership data, which should usually be, "In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.";
  - A statement regarding assumptions, which should usually be, "In my opinion, the assumptions are appropriate for the purpose(s) of the valuation(s).";
  - A statement regarding methods, which should usually be, "In my opinion, the methods employed in the valuation are appropriate for the purpose(s) of the valuation(s)."; and
  - A statement regarding conformity, which should be, "This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada." [Effective June 30, 2013]
- .04 The external user report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation. [Effective June 30, 2013]

#### **Dates**

- .05 The wind-up date of the post-employment benefit plan would be determined by the plan administrator or the plan sponsor or others with responsibility to wind up the plan, based on the plan provisions, the law, and the circumstances of the wind-up.
- .06 The calculation date of the funded status would usually be the wind-up date.
- .07 For a particular member, the date of calculation of benefit entitlement would depend on the circumstances of the wind-up and the terms of the post-employment benefit plan, and may be the date of termination of employment, the date of termination of membership, the wind-up date, or another date.

### **Nature of wind-ups**

- .08 The purpose of a wind-up valuation may be to determine, or to provide the basis for determining:
- The funded status of the post-employment benefit plan;
  - The total value of the benefit entitlements of all members prior to taking account of the funded status of the post-employment benefit plan;
  - Any required additional funding;
  - The amounts and methods of determining benefit entitlements, including any adjustment required due to a wind-up deficit;
  - The amount and method of distribution of a wind-up surplus; or
  - Payout for loss of benefit entitlements upon insolvency.
- .09 A wind-up may be complex and may take a long time. Delays may require a series of reports by the actuary. Since the funded status or other available funds for the post-employment benefit plan at the final settlement date may affect whether benefit entitlements can be settled in full, the reflection of subsequent events in each report would be critical.

### **Membership data**

- .10 The finality of wind-up would call for the actuary to obtain precise membership data. The membership data are the responsibility of the plan sponsor or plan administrator. However, if the actuary is working with incomplete, unreliable, or missing data the actuary would make assumptions regarding the data. The actuary may, if the circumstances dictate, include a provisional sum in the wind-up valuation with respect to missing members if the actuary believes that additional members might have benefit entitlements under the post-employment benefit plan but their membership information is missing.

### **Assumptions**

- .11 The selected assumptions would:
- In respect of benefit entitlements that are assumed to be settled by purchase of insurance, reflect single premium rates; and
  - In respect of benefit entitlements that are assumed to be settled in some other manner, reflect the manner in which such benefits would be settled.

- .12 If future benefits depend on continued employment, the actuary would consider reflecting contingent events. For example, if a member is eligible for post-retirement benefits only if the member remains in employment until age 55, the actuary may make an assumption as to the probability of this event occurring and the member's benefit may be discounted for the probability of the event occurring.
- .13 Wind-up expenses usually include, but are not limited to:
- Fees related to the preparation of the actuarial wind-up report;
  - Legal fees;
  - Insurer or adjudicator administration expenses; and
  - Custodial and investment management expenses.
- .14 The actuary would either net wind-up expenses against the post-employment benefit plan's assets, if any, or add the assumed wind-up expenses to the post-employment benefit plan's liabilities in calculating the ratio of assets to liabilities as a measure of financial security of the benefit entitlements, unless the expectation is that expenses will not be paid from the post-employment benefit plan's assets, if any. 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.

#### **Subsequent events**

- .15 Ideally, in a wind-up valuation, all subsequent events would be reflected. This ensures that the funded status is presented as fairly as possible as of the report date. However, it would be impossible to recognize subsequent events right up to the report date. Accordingly, the actuary would select a cut-off date that is close to the report date.
- .16 The actuary would ascertain that no subsequent events have occurred between the cut-off date and the report date that would change the funded status significantly; 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.
- .17 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.

.18 Common subsequent events are:

- Contributions remitted to the plan;
- Expenses paid from the post-employment benefit plan's assets, if any;
- Actual investment return on the post-employment benefit plan's assets, if any;
- Change in assumptions;
- Corrections to the membership data; and
- Deaths of members or other significant plan experience.

**Use of another person's work**

.19 Some aspects of the wind-up may be unclear to the actuary or contentious. Examples are:

- 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 or health care cost trend rate in determining benefit entitlements;
- Eligibility for benefits payable only with the consent of the plan sponsor or plan administrator;
- The liquidation value of the post-employment benefit plan's assets, if any;
- The method to allocate the post-employment benefit plan's assets, if any, among members; and
- Whether or not wind-up expenses are to be paid from the post-employment benefit plan's assets, if any, or included in the calculation of the liabilities or expected future benefits.

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

**Statements of opinion**

.21 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.

## 6400 Financial Reporting of Post-Employment Costs

- .01 This section 6400 applies to advice that an actuary provides regarding financial reporting of a post-employment benefit plan's costs and obligations in the employer's financial statements, or the post-employment benefit plan's financial statements, or the financial statements of the trust associated with the post-employment benefit plan, where the calculations and advice are provided in accordance with an applicable financial reporting standard.

### 6410 General

- .01 For financial reporting purposes, the actuary should use methods and assumptions for the value of assets, if any, and post-employment benefit obligations that are appropriate to the basis of financial reporting in the employer's or post-employment benefit plan's or trust's financial statements, as applicable, and that are consistent with the circumstances affecting the work. [Effective February 1, 2018]

#### Circumstances affecting the work

- .02 For the purposes of section 6400, the circumstances affecting the work would include:
- The terms of the appropriate engagement under which the work is being performed; and
  - The application of the law to the work.
- .03 The actuary would reflect the financial reporting standards specified by the terms of the appropriate engagement. Where financial reporting standards require methods and assumptions to be established by the preparers of the financial statements, the actuary would use the methods and assumptions specified by the preparers of the financial statements.

#### Plan provisions

- .04 The actuary would determine the plan provisions with sufficient accuracy for the purposes of the valuation. Sources of information on plan provisions include:
- Current plan documents;
  - Funding or underwriting arrangements;
  - Collective bargaining agreements;
  - Information regarding past practices;
  - Cost-sharing arrangements between the plan sponsor(s) or plan administrator and plan members; and
  - Communication between the plan sponsor or plan administrator and the plan members.

Prior plan provisions may be needed to analyze claims information from periods prior to the calculation date.

- .05 The actuary would consider all benefits in accordance with the terms of the appropriate engagement that are to be payable under the post-employment benefit plan and would include provision for all such benefits expected to be paid under the plan.

**Anticipated amendment or deferred recognition of a pending amendment**

- .06 The actuary's advice on a post-employment benefit plan may reflect an expected amendment to the plan if the amendment is definitive or virtually definitive, as appropriate based on the applicable financial reporting standard.
- .07 The effective date of the amendment is the date at which the amended benefits take effect, as opposed to the date when the amendment becomes either definitive or virtually definitive.
- .08 If an actuary is aware of an expected amendment to the post-employment benefit plan, but does not reflect the amendment in the work, then the actuary would report the event in accordance with the requirements for the disclosure of subsequent events.

**Data**

- .09 In addition to the current plan membership and asset data, if any, the actuary would collect information on historical claims experience, such as nature of absence and benefit levels. Data may come from the plan sponsor or plan administrators or other sources, such as insurance carriers, brokers, or external third-party plan administrators.
- .10 In identifying the data needed, the actuary would bear in mind the pertinent benefits (i.e., those applicable during retirement, disability, or following termination of employment). If applicable, the actuary may obtain claims data split by plan, by age, by location, by status (retiree, inactive, spouse, etc.) and by type of expense (drug, hospital, payment for loss of income, etc.).
- .11 Where appropriate, in analyzing any relevant historical claims data, the data would be adjusted to reflect the trend in the cost of benefits between the reference period and the calculation date. Where appropriate, the actuary would also adjust past experience results to reflect non-recurring influences such as changes in the benefits offered, significant changes in the demographics of the group, changes in government programs, or unusual claims.
- .12 Available data may have limited value or 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. Such other data would be adjusted appropriately for the expected differences between these groups and the group from which the data were drawn.

- .13 The actuary may project data, including membership data and data with respect to claim costs from the effective date of the data to the calculation date, using appropriate extrapolation techniques. The actuary would not normally extrapolate membership data more than three years from the effective date of the membership data. The actuary may also use recent credible claims experience in the extrapolation.

### **Assumptions**

- .14 The assumptions that the actuary uses would be best estimate assumptions, unless otherwise specified in the relevant financial reporting standards or as otherwise selected by the preparers of the financial statements.
- .15 Repealed
- .16 In determining initial claim costs assumptions, the actuary would consider available claims experience with regards to items such as:
- Claimant age, member status, coverage category, and benefit type;
  - Credibility; and
  - Relevance to future periods and future benefit provisions.
- .17 In situations where there are insufficient data with respect to claim costs—for example, if the post-employment benefit plan has only a small number of members or does not yet have any members in payment status—the actuary may develop the applicable assumptions based on experience with other similar plans.
- .18 If the actuary is determining the assumption with respect to the future claims trend rate, where necessary, it may be divided into short-term and longer-term components. The short-term component would often be based on the level experienced in the recent past by the plan and plan members. The longer-term component would be consistent with the assumption regarding future changes in benefit programs and general economic conditions such as nominal Gross Domestic Product growth. The actuary would determine the period of time required to transition from the short-term trends to the longer-term trends.

### **Expenses**

- .19 The actuary's advice on a post-employment benefit plan would take account of expenses, including whether or not they are expected to be paid from the post-employment benefit plan's assets, if any.

- .20 The actuary would consider, as part of the claims experience, the administration costs related to the adjudication of the claims including any related general administration expenses charged by the party adjudicating the claims and all applicable taxes. The actuary may also consider other expenses related to the post-employment benefit plan.

## 6420 Reporting: External User Report

.01 An external user report should:

- Include the calculation date and the report date;
- Describe the sources of membership data, plan provisions, the post-employment benefit plan's assets, if any, and historical claims data, if any, and the dates at which they were compiled;
- Describe the membership data and any limitations thereof, and any assumptions made about missing or incomplete membership data;
- Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;
- Describe the assets, if any, including their market value and a summary of the assets by major category and the method used to value the post-employment benefit plan's assets;
- Describe the post-employment benefit plan's provisions, including the identification of any definitive or virtually definitive pending amendment of which the actuary is aware, and whether or not such amendment has been reflected in determining the plan's obligations;
- Describe any commitment to provide benefits beyond the terms of the plan reflected in the valuation of post-employment benefit obligations;
- Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, and, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
- Include all other provisions as required for disclosure purposes as per the terms of the appropriate engagement, such as:



- Reporting the funded status at the calculation date and the applicable service cost or expected cost of new claims;
  - Describing the method and period selected in connection with any amortizations; and
  - Stating whether or not the valuation and/or extrapolation conforms with the actuary's understanding of the financial reporting standards specified by the terms of an appropriate engagement. [Effective February 1, 2018]
- .02 An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:
- A statement regarding membership data, which should usually be, “In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
  - A statement regarding assumptions which should usually be, “In my opinion, the assumptions are appropriate for purposes of the valuation.”;
  - A statement regarding calculations, which should usually be, “In my opinion, the calculations have been made in accordance with my understanding of the requirements of [name financial reporting standard]”; and
  - A statement regarding conformity, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.” [Effective March 31, 2015]
- .03 An external user report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation. [Effective June 30, 2013]

#### **Membership data**

- .04 Any assumptions and methods used in respect of insufficient or unreliable membership data would be described.

#### **Reference to other external reports**

- .05 The descriptions required in the external user report may be incorporated by reference to another actuarial valuation report prepared in accordance with accepted actuarial practice in Canada.

## 7000 – Social Security Programs

## Table of Contents

<b>7100</b>	<b>Scope .....</b>	<b>7003</b>
<b>7200</b>	<b>General .....</b>	<b>7004</b>
7210	Circumstances affecting the work .....	7004
7220	Data.....	7005
<b>7300</b>	<b>Valuation .....</b>	<b>7006</b>
7310	Methods.....	7006
7320	Assumptions .....	7007
7330	Economic Assumptions.....	7008
7340	Non-economic Assumptions.....	7009
7350	Margins for Adverse Deviations .....	7009
7360	Sensitivity Testing .....	7010
<b>7400</b>	<b>Experience Analysis.....</b>	<b>7012</b>
<b>7500</b>	<b>Reporting on the Valuation of a Social Security Program.....</b>	<b>7013</b>

## **7100    Scope**

01. Part 1000 applies to work within the scope of this part 7000.
02. The standards in part 7000 apply to an actuary when performing or reviewing, advising on, or opining on work related to social security programs.
03. In Canada, the social security programs include the Canada Pension Plan (CPP), the Québec Pension Plan (QPP), the Old Age Security (OAS) program, and other similar plans that fall under the definition of social security program.
04. The standards in part 7000 do not apply to programs established solely or primarily for government employees, to workers' compensation programs, or to programs that primarily provide health insurance or property and casualty insurance.

## 7200 General

### 7210 Circumstances affecting the work

.01 The actuary's work on the valuation of benefit liabilities or other items contained in the financial statement of a social security program, or on the financing arrangements of a social security program, should take into account the circumstances affecting the work. [Effective February 1, 2018]

.02 The circumstances affecting the work would include

- terms of the relevant statute, regulations, and other binding authorities;
- relevant accounting standards and policies; and
- terms of an appropriate engagement under which the work is being performed;

and the circumstances affecting the work may include the financing policy of the social security program.

.03 The terms of an appropriate engagement would define the role of the actuary and the purpose of the work. The work of the actuary may include the provision of advice on the financing of the social security program, its financial condition, and any other actuarial item required under the terms of an appropriate engagement.

.04 The terms of an appropriate engagement may specify applicable policies of the social security program relevant to the work of the actuary. These policies may include a formal or informal financing policy, an accounting policy, and an investment policy.

.05 Significant terms of an appropriate engagement may stipulate one or more of

- use of a specified asset value or method of asset valuation; and
- use of a specified financing method based on a pre-determined financing objective.

.06 Objectives of financing specified by the terms of an appropriate engagement may include, but are not limited to, a specific funding target, the security of benefits, a principle of equity among generations, and/or a stable contribution rate over the long term.

.07 The actuary would take into account established practice (if relevant) when no law exists with regard to certain benefit provisions or financial measures (for example, the basis for future indexation of retirement benefits).

## 7220 Data

- .01 Where sufficient, reliable, and relevant data are not available for the valuation of a specific benefit, the actuary should make appropriate assumptions and/or introduce appropriate methods to compensate for any perceived deficiencies in the data.  
[Effective October 15, 2017]
- .02 Sufficient, reliable, and relevant data may not be available to the actuary in various circumstances, for example,
- a newly established social security program;
  - the relevant statute may have been amended to provide a new or revised benefit;
  - an applicable policy of the social security program may have been recently revised; or
  - the social security program administration practices may have recently changed.
- .03 Where the data are not sufficient, not fully reliable, and/or not sufficiently relevant to expected future experience for a specific benefit, the actuary may consider taking one or more of the following actions:
- introducing appropriate assumptions regarding missing, incomplete, or unreliable data; and
  - adjusting data and historical experience for the purpose of the work, as appropriate, to remove any perceived distortions, such as the effect of historical inflation or one-time benefit changes.
- .04 For a newly established or substantially changed social security program, the actuary would take into account other relevant information, including relevant experience of comparable social security programs.

## 7300 Valuation

### 7310 Methods

- .01 The actuary should value the social security program assuming that it continues indefinitely as a going concern. [Effective October 15, 2017]
- .02 The actuary should select an actuarial cost method that is consistent with the circumstances affecting the work. [Effective February 1, 2018]
- .03 The actuary's work should take into account the benefits, relevant policies, and administration practices of the social security program, as of the calculation date, and should take into account any virtually definitive amendment to these items that is expected to have a material effect on benefits, unless the circumstances affecting the work require otherwise. [Effective February 1, 2018]
- .04 The actuary would use a valuation methodology that is consistent with the financing method used for the social security program. Two methods are available:
- An open group methodology, under which contributions and benefits of both current and future participants are considered, is most appropriate for pay-as-you-go and partially funded social security programs and may also be used for social security programs that are meant to be fully funded; and
  - A closed group methodology, under which only current participants are considered, with or without their assumed future benefit accruals and contributions, is only appropriate for a fully funded social security program that is meant to be fully funded.
- .05 For a social security program that is meant to be fully funded, the actuary would:
- Measure the funded status of the social security program under a closed group methodology; and
  - If also using an open group methodology, disclose the relationship between the social security program's current assets and the present value of its future contributions and the present values of its current and anticipated future liabilities over the projection period.

- .06 Based on the circumstances affecting the work, the actuary may judge an alternative valuation methodology to be more appropriate. That approach would be used with justification communicated in the report.

- .07 The projection period used in the actuary's work should be sufficient considering the circumstances affecting the work. [Effective February 1, 2018]

#### **Amendments and subsequent events**

- .08 The actuary's valuation of the social security program would reflect all virtually definitive amendments of which the actuary is aware on the calculation date, including those amendments with an effective date after the calculation date. Where the circumstances affecting the work require otherwise, the actuary may exclude the effect of a known virtually definitive amendment, but the actuary would disclose the effect of such amendment.

#### **7320 Assumptions**

- .01 The actuary should select assumptions that reflect the projection period and the expectation that the social security program will continue indefinitely as a going concern, but may adjust such assumptions to reflect short-term considerations, where appropriate. [Effective October 15, 2017]
- .02 The actuary should select either best estimate assumptions or best estimate assumptions modified to incorporate margins for adverse deviations to the extent, if any, mandated by law or by the circumstances affecting the work, and should provide the rationale for the decision made with respect to the inclusion or exclusion of margins. [Effective February 1, 2018]
- .03 Where a social security program has a policy or history of providing ad hoc adjustments to contributions or to benefits, or a periodic update of parameters of the program, such as the maximum insurable earnings, the actuary should recognize such policy or history when valuing the social security program by selecting assumptions consistent with such policy or history as appropriate, unless a virtually definitive decision to discontinue such adjustments or updates has been taken by the social security program. The actuary should value the social security program with and without any assumed ad hoc adjustments. [Effective October 15, 2017]



- .04 The actuary would consider any automatic balancing mechanisms that exist in a social security program when selecting the assumptions. The actuary would consider to what extent the social security program is “immunized” from the volatility of some variables by the automatic balancing mechanisms.

### **7330 Economic Assumptions**

- .01 The needed economic assumptions may include
- the discount rate;
  - the expected rate of investment income;
  - the expected investment and administrative expenses;
  - the expected rate of general inflation;
  - the expected real wage growth;
  - the expected labour force participation rate; and
  - the expected unemployment rate.
- .02 The economic assumptions needed would depend on the nature of the benefits that are being valued, and may vary by year.
- .03 The actuary would develop and disclose separate nominal assumptions, but may prefer to complete the calculations using rates that are net of inflation, net of expenses or net of some other factor.
- .04 When determining the best estimate assumption for the expected rate of investment income, the actuary would take into account the expected pattern of risk-free rates of return, the expected additional investment return on the assets of the social security program at the calculation date, if any, and the expected investment policy after that date. The actuary would provide justification for the expected additional investment return. Possible justifications include
- additional returns over risk-free rates expected to be earned on non-risk-free fixed income assets of the type and quality owned on the reporting date and expected to be acquired pursuant to the investment policy of the social security program;
  - additional returns over risk-free interest rates expected to be earned on other types of investments, including publicly traded common or preferred equities, private placements, real estate, and private equity; and
  - projected composition of the investment portfolio in future years.

In establishing the assumption for the expected rate of investment income, the actuary would assume that there would be no additional returns achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy except to the extent that the actuary has reason to believe, based on relevant supporting data, that such additional returns will be consistently and reliably earned over the long term.

- 05 The expected investment expenses would depend on the investment policy of the social security program and the types of investments held and projected to be held in the future.
- .06 The assumed expected rate of investment income need not be a flat rate but may vary from period to period.

### **7340 Non-economic Assumptions**

- .01 When setting non-economic assumptions, the actuary would reflect all material contingencies.
- .02 The needed non-economic assumptions may include
- the benefit take-up rates;
  - the expected fertility rate;
  - the expected migration rate; and
  - the expected mortality and morbidity rates.

### **7350 Margins for Adverse Deviations**

- .01 The actuary should not include any margins for adverse deviations when the circumstances affecting the work require a best estimate calculation. [Effective February 1, 2018]
- .02 The actuary should include one or more margins for adverse deviations when the circumstances affecting the work require such margins. A non-zero margin should be sufficient, without being excessive. The overall provision for adverse deviations resulting from the application of all margins for adverse deviations should be appropriate in the aggregate. [Effective February 1, 2018]
- .03 If the actuary is required by the circumstances affecting the work to use a margin for adverse deviations that is outside the range that the actuary considers appropriate, the actuary may use such imposed assumption, but the actuary should disclose that the margin is outside of the appropriate range and disclose the reason for using such margin. [Effective February 1, 2018]

- .04 Examples of situations where the circumstances affecting the work might require an unbiased calculation include
- the legislation governing the social security program requires an unbiased calculation; or
  - the social security program's financing policy requires the use of best estimate assumptions.
- .05 Examples of situations where the circumstances affecting the work might require the inclusion of one or more margins for adverse deviations include
- the relevant legislation or financing policy requires inclusion of margins for adverse deviations; or
  - the level of uncertainty or volatility around a particular assumption is high, and not considered to be sufficiently mitigated by the underlying adaptability of the social security program.
- .06 Where the actuary includes a margin for adverse deviations, the actuary would provide the rationale for inclusion of the margin and for the selection of the specific amount of the margin. The rationale may include considerations such as
- the financing policy of the social security program;
  - the relative importance placed on the balancing of competing interests (e.g., benefit security versus cost of the social security program);
  - the level of uncertainty inherent in the assumption;
  - the level of reliability or credibility of the data or historical information upon which the assumption is based;
  - the asset/liability mismatch risk; and
  - the legislative or other restrictions on the ability to mitigate past adverse experience.

### 7360 Sensitivity Testing

.01 The actuary should perform sensitivity testing of adverse scenarios to illustrate plausible material risks to which the social security program may be exposed and to aid in the understanding of the effect of adverse changes to assumptions. [Effective October 15, 2017]

.02 The actuary may also perform sensitivity testing of favourable scenarios.

- .03 When selecting the assumptions and scenarios for sensitivity testing, the actuary would consider the circumstances affecting the work, and would select those assumptions that have a material impact on the valuation. The actuary may consider the use of testing of integrated sensitivity scenarios, for example, the effect of a deep and prolonged recession.
- .04 Assumptions tested may include, but are not limited to, the following:
- investment rate;
  - real wage growth;
  - labour force participation rates; and
  - mortality rates.

## 7400 Experience Analysis

- .01 The actuary should conduct an experience analysis, including a comparison of actual and expected experience for the period between the prior calculation date and the current calculation date. [Effective October 15, 2017]
- .02 The actuary should conduct a reconciliation of the main results of the social security program valuation between the prior calculation date and current calculation date. The reconciliation should include an analysis and itemization of the changes in the methodology and assumptions used, legislative amendments that occurred, or other components of the valuation that contributed to the change in the main results. [Effective October 15, 2017]
- .03 The actuary's analysis would include all significant experience variations. At a minimum, the actuary's analysis would consider the impact of any significant changes to the assumptions or methods used, any significant changes to the benefits or policies of the social security program, gains or losses due to investment returns on the social security program's assets, legislative changes, and any other areas where the difference between actual and expected experience is significant.

## 7500 Reporting on the Valuation of a Social Security Program

- .01 For work pursuant to this part, the actuary should prepare a report that:
- states the calculation date and the report date of the actuarial opinion given;
  - identifies the legislation or other authority under which the work is completed;
  - describes the significant terms of the appropriate engagement that are material to the actuary's work, including the purpose of the work;
  - describes the sources of the participants data, program provisions and policies, and assets, if any, and the dates at which they were compiled;
  - describes the data used for the valuation and any limitations thereof, and any significant assumptions made about insufficient or unreliable data;
  - describes the social security program's provisions, significant policies, and relevant administration practices, including the identification of any amendments made since the prior calculation date, and the effect of such amendments on the program's financial condition;
  - describes the social security program's source(s) of financing;
  - describes any automatic balancing mechanisms of the social security program;
  - describes any definitive or virtually definitive amendment, policy change or change to administration practice, confirms whether or not such amendment or change has been reflected in the valuation, and identifies the effect of such amendment or change on the program's financial condition;
  - discloses any subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no subsequent events of which the actuary is aware, include a statement to that effect;
  - describes the nature and extent of material risks faced by the social security program, and the approach taken by the actuary to assess those risks;
  - states that the assumptions are best estimates, where that is the case, or discloses the aggregate provision for adverse deviations in the results, where the assumptions include margins for adverse deviations;

- describes the methodology used to assess the financial condition of the social security program at the calculation date. The description of the methodology should specify:
  - whether it is based on a closed or open participants group, and
  - how any automatic balancing mechanisms, if present, are incorporated;
- presents the projections of the components of the program's cash flows, including the contributions, benefits, administrative expenses, and investment income, if any;
- presents the key results of the valuation with and without any assumed ad hoc adjustments;
- states the key contribution rates required for the social security program, if applicable;
- describes and quantifies a reconciliation of the actual and expected experience with respect to the assets, if applicable, expenditures, and key contribution rates or other indicators of the social security program from the prior calculation date to the current calculation date; and
- describes sensitivity or scenario testing performed for key assumptions and reports the results of such testing.

Depending on the terms of the engagement, the report should:

- state the prior calculation date and next calculation date, as applicable;
- describe the social security program's assets, if any, including their market value, the assumptions and methods used to value the assets, and a summary of the assets by major category;
- state the financial condition of the social security program; and
- if the social security program is meant to be fully funded, state:
  - its funded status at the calculation date under a closed group methodology;
  - if also using an open group methodology, the extent to which the social security program's current assets and the present value of its future contributions cover the present values of its current and anticipated future liabilities over the projection period under an open group methodology;

and describe the differences between the above two measures. [Effective February 1, 2018]

.02 The report should provide the following five statements of actuarial opinion, all in the same section of the report and in the following order:

- A statement regarding the data, which would usually be, “In my opinion, the data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
- A statement regarding the assumptions, which would usually be, “In my opinion, the assumptions used for the purpose of the valuation are reasonable and appropriate, both individually and in aggregate.”;
- A statement regarding the methods, which would usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose of the valuation.”;
- If applicable to the mandate, a statement certifying the required key contribution rates or other measures to finance the social security program. The statement may take the form of:

“Based on the results of this valuation, I hereby certify that the [name(s) of key contribution rate(s) and/or other measure(s)] to finance the [name of social security program] is [X.XX]% for the year [YYYY] and thereafter”;

- A statement regarding conformity to accepted actuarial practice, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.”  
[Effective October 15, 2017]

.03 The report should be sufficiently detailed to enable another actuary to examine the reasonableness of the valuation and to enable stakeholders, policymakers, and other interested parties to make informed decisions regarding the social security program.  
[Effective October 15, 2017]

.04 There are several measures the actuary may use to present the results, including

- projected cash flows and ending positions,
- discounted cash flows, and/or
- contribution rates required.



- .05 The actuary may be asked to answer questions regarding the financial condition of the social security program, such as the estimated effect from changing an assumption used in the most recent valuation. In such instances, the actuary would specify the purpose and scope of the work and any limitations or constraints that apply to the interpretation of the results of the work compared to the results of the most recent valuation. If an actuarial opinion is required for such work, the actuarial opinion would be similarly adjusted.
- .06 The circumstances affecting the work may result in a deviation from accepted actuarial practice in Canada. For example, the applicable legislation or the terms of engagement may require that the actuary use a margin for adverse deviations that is outside the range that the actuary considers appropriate. In such case, the actuary would disclose such deviation in the report, and if practical, useful, and appropriate under the terms of the engagement, report the results of applying accepted actuarial practice.