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2000—INSURERS

2200 VALUATION OF POLICY LIABILITIES: P&C INSURANCE

2210 SCOPE

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

.02 Repealed

2220 CLAIM LIABILITIES

.01 *The amount of the claim liabilities should be equal to the present value, at the balance sheet date, of cash flow on account of claims (and of related expenses and taxes) incurred before that date.* [Effective January 1, 2003]

.02 The amount of claim liabilities consists of the following components

the amount of the case estimates,

a provision (which may be positive or negative) for development on reported claims, including claim adjustment expenses, and

a provision for incurred but unreported claims, including claim adjustment expenses.

.03 The development on reported claims compensates for the inadequacy or redundancy in case estimates.

.04 The incurred but unreported claims are those not yet reported to the insurer, including those reported but not yet recorded.

.05 The development on reported claims and the incurred but unreported claims need not be calculated separately. Some valuation methods calculate only their combined amount.

.06 The selection of valuation methods depends on the circumstances of the case. The actuary would usually consider several methods, each of which involves assumptions; e.g., an assumption that the settlement patterns of the available past claims experience are uniform and the same as those of the insurer's future claims experience. The actuary would where practical adjust the available past claims experience in order to recognize those assumptions.

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

1730.08
1730.10
1730.17

the insurer's underwriting practice,

its claims handling practice, including case estimate practice,

its reinsurance,

its data processing, and

its accounting,

and as a result of external changes, such as inflation and changes in

the judicial, regulatory, and legislative environment, or

residual insurers, like the Facility Association.

.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 balance sheet date, of cash flow on account of premium development and of the claims, expenses, and taxes to be incurred after that date on account of the policies in force at that date or an earlier date.* [Effective January 1, 2003]

2130.03

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

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

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

2240 PRESENT VALUES

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

the method of valuing assets and reporting investment income,

the allocation of those assets and that income among lines of business,

the return on the assets at the balance sheet date,

the yield on assets acquired after the balance sheet date,

the capital gains and losses on assets sold after the balance sheet date, and

investment expenses, and losses from default (C-1 risk).

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

2250 MARGIN FOR ADVERSE DEVIATIONS

.01 The standards in this subsection 2250 apply to the selection of a margin for adverse deviations in the assumptions for a valuation of policy liabilities by a single scenario valuation. 1740.39

.02 *The actuary should select a margin for adverse deviations for an assumption which is within the range defined by the low margin and the high margin for that assumption. The criteria for selection of that margin are the considerations for that assumption.* 2250.10

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

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

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

.04 *The selected margin should vary*

> *between premium liabilities and claim liabilities,*
>
> *among lines of business, and*
>
> *among accident years, policy years, or underwriting years, as the case may be,*

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

Assumptions subject to margin

.05 The actuary would include margin in the assumptions for

> claims development,
>
> recovery from reinsurance ceded, and
>
> investment return rates.

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

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

Amounts of high and low margins

.07 The margin for claims development is a percentage of the claim liabilities excluding provision for adverse deviations.

.08 The margin for recovery from reinsurance ceded is a percentage of the amount deducted on account of reinsurance ceded in calculating the premium liabilities or claim liabilities, as the case may be, without provision for adverse deviations.

.09 The margin for investment return rate is a deduction from the expected investment return rate per year.

.10 The amounts of margin are:

	High	Low
Claims development	15%	2.5%
Recovery from reinsurance ceded	15%	Zero
Investment return rates	200 basis points	50 basis points

.11 Selection of a margin for adverse deviations above the high margin may be appropriate for unusually high uncertainty – for example, during the transition to new insurance coverages.

Considerations

.12 A consideration for an assumption generates lack of confidence in that assumption as a result of past or future instability of the consideration or a shortcoming in its quality, quantity, or performance. For example,

> Instability in the guidelines for setting and reviewing case estimates may result in inconsistent development among accident years, and
>
> A history of claim and coverage disputes with a reinsurer creates uncertainty of recovery of 100¢ in each dollar of the reinsurer's share of liabilities.

.13 The actuary would select and evaluate considerations for each assumption which are appropriate to the circumstances of the insurer, including

> insurer practices, for example, the guidelines for setting and reviewing case estimates,
>
> data, for example, the stability of claims frequency and average claim cost,
>
> reinsurance, for example, the history of claim and coverage disputes with reinsurers,
>
> investments, for example, the matching of assets and liabilities, and
>
> the external environment, for example, the effect of regulatory change on claim settlements.

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

2310 SCOPE

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

2320 METHOD

.01 *The actuary should calculate policy liabilities by the Canadian asset liability method.* 2130.37

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

.03 *The term of the liabilities should take account of any renewal, or any adjustment equivalent to renewal, after the balance sheet date if* 2320.16

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

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

.04 *In forecasting the cash flow which the policy liabilities comprise, the actuary should* 2130.05

take account of policyholder reasonable expectations, and

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

.05 *The actuary should calculate policy liabilities for multiple scenarios and adopt a scenario whose policy liabilities make sufficient but not excessive provision for the insurer's obligations in respect of the relevant policies.* 1740.04

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

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

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

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

.08 The scenarios of interest rate assumptions should comprise

> *a base scenario which, unless otherwise promulgated, assumes continuance of reinvestment and inflation rates at the balance sheet date, and, unless there is explicit reason to assume otherwise, the insurer's then current investment strategy,*
>
> *each of the prescribed scenarios in a deterministic application,*
>
> *ranges which comprehend each of the prescribed scenarios in a stochastic application, and*
>
> *other scenarios appropriate for the circumstances of the insurer.* [Effective January 1, 2003]

Liability grouping and asset segmentation

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

Other methods

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

Supporting assets

.11 In allocating assets to support liabilities, the actuary would preserve the connection between unamortized capital gains, both realized and unrealized, and the asset segments which generated them.

.12 The value of the assets which support policy liabilities at the balance sheet date would be their value in the insurer's financial statements; i.e., book value, taking account of accrued investment income and of adjustments for impairment, amortized unrealized capital gains, and amortized realized capital gains.

.13 The forecasted cash flow of the assets would take account of any related, off-balance sheet, financial instruments.

.14 The forecast of cash flow from taxes would take account of permanent and temporary differences between the amortization of capital gains in accordance with generally accepted accounting principles and in accordance with tax law.

.15 The assumed cash flow from policyholder dividends would avoid omission and double counting. For example, if the dividend scale includes distribution of a deferred realized capital gain (net of any corresponding future tax asset), then the assumed cash flow from policyholder dividends would exclude that distribution. In the opposite case, the assumed cash flow from policyholder dividends would provide for negative distribution of a deferred realized capital loss asset (net of any corresponding future tax liability). Such avoidance is appropriate only in the case of liabilities and would not be appropriate if the dividend scale included distribution of assets that support capital, or distribution of investment income on assets that support capital. 2320.35

Term of the liabilities

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

> a flexible premium deferred annuity where the interest guarantee and cash value attached to each premium are independent of those for the other premiums, and
>
> a certificate of voluntary non-contributory association or creditor group insurance.

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

.18 In this context,

> "renewal" means the renewal of a policy at the end of its term, with the insurer having discretion to adjust premiums or coverage for the new term,
>
> "adjustment" means an insurer's adjustment to a policy's coverage or premiums equivalent to that in a renewal, and
>
> "constraint" means a constraint on the insurer's exercise of discretion in renewal or adjustment which results from contractual obligations, legally binding commitments, and policyholder reasonable expectations. Examples of constraint are an obligation to renew a policy unless renewal is refused for all other policies in the same class, a guarantee of premiums, a guarantee of credited interest rate, a general account guarantee of segregated fund value, and a limitation on the amount of adjustment. "Constraint" would not include a price-competitive market expected at renewal or adjustment. 2320.28

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

.20 If the term of the liabilities is not evident, and if selection of a longer term would reduce policy liabilities, then the actuary would be cautious in making such a selection. On the other hand, if selection of a longer term would increase those liabilities, then the actuary would usually select the longer term. Substance would supersede form in the selection; for example, a universal life policy which is in form an annual premium life insurance policy may be in substance a single premium deferred annuity.

.21 The term of the liabilities of

a policy which has been cancelled by the insurer ends at the effective date of cancellation.

a policy which has not been cancelled, but which is cancellable by the insurer at or before the date to which its premiums have been paid, ends at that date.

an individual annual premium life or accident and sickness insurance policy ends at the last day to which the policyholder may prolong its coverage without the consent of the insurer.

a certificate of group insurance if the group policy is in effect a collection of individual policies is the same as if it were an individual policy, unless contributions or experience rating of the group negate anti-selection by certificate holders.

.22 The term of the liabilities of any other policy ends at the earlier of

the first renewal or adjustment date at or after the balance sheet date at which there is no constraint, and

the renewal or adjustment date after the balance sheet date which maximizes the policy liabilities.

.23 The actuary would extend such term solely to permit recognition of cash flow to offset acquisition or similar expenses

whose recovery from cash flow that would otherwise be beyond such term was contemplated by the insurer in pricing the policy, and

where the value of the additional cash flow recognized by such extension of the term cannot exceed the value of the remaining balance of acquisition or similar expenses.

.24 The balance of acquisition or similar expenses would be written down to zero using an appropriate method. Such method would:

have a term consistent with the extended term established at inception,

have a write-down pattern reasonably matched with the net cashflow available to offset these expenses at inception, and

be locked in, so the amount of write-down in each period will not fluctuate from the expected amount established at inception provided such balance is recoverable from the additional cash flow recognized at the balance sheet date, and where not fully recoverable at the balance sheet date, is written down to the recoverable amount, with the expected amount of write-down in each future period proportionately reduced.

.25 That implies that the term ends at

the balance sheet date if the policy is continually renewable or adjustable without constraint,

the first renewal or adjustment after the balance sheet date if there is no constraint at that renewal or adjustment, and

a renewal or adjustment determined by testing for any other policy. The actuary would calculate the policy liabilities assuming that the term of its liabilities ends at each renewal or adjustment at or after the balance sheet date up to and including the first renewal or adjustment at which there is no constraint, and would select the term corresponding to the largest policy liabilities.

.26 A change in the outlook may provoke a change in the term of a policy's liabilities. For example, the constraint of a cost of insurance guarantee which previously lengthened the term of the policy's liabilities may no longer do so if the outlook for mortality improves. On the other hand, the constraint of a guaranteed credited interest rate which previously was considered innocuous may become meaningful, and thereby lengthen the term of the policy's liabilities, if the outlook changes to one of lower interest rates.

.27 For example, the term of the liabilities ends at

the balance sheet date for a daily interest rate deposit without minimum guarantee, an administrative services only (ASO) contract without expense guarantee, and the general account portion of a deferred annuity with segregated fund liabilities but without guarantees; for example, with no guarantee of the segregated fund value,

the first renewal of a single premium deferred annuity which is, in effect, a term deposit (i.e., having a credited interest rate guarantee for a stipulated period, say three years, beginning at the date of deposit, and no guarantee thereafter),

the first renewal (usually one year after the previous renewal) of a group policy which insures employee benefits, unless there is a constraint at that renewal, and

the next renewal date or adjustment date even if there is a constraint at renewals and adjustments at and after that date, but the constraint is so weak that its operation does not increase policy liabilities.

Policyholder reasonable expectations

.28 The insurer's policies define contractually its obligations to its policyholders. The contractual definition may leave certain matters to the insurer's discretion, such as

the determination of policyholder dividends, experience-rating refunds, and retrospective commission adjustments, and

the right to adjust premiums.

.29 Matters left to the insurer's discretion implicitly include

underwriting and claim practices, and

the right to waive contractual rights and to create extra-contractual obligations.

.30 Policyholder reasonable expectations are the expectations which

may be imputed to policyholders as their reasonable expectations of the insurer's exercise of discretion in those matters, and

arise from the insurer's communication in marketing and administration, from its past practice, from its current policy, and from general standards of market conduct. Past practice includes the non-exercise of discretion; for example, long non-exercise without affirmation of a right to adjust premiums may undermine it. The insurer's communication includes policyholder dividend and investment performance illustrations at sale of a policy and that of intermediaries reasonably perceived as acting in its behalf.

.31 In selecting assumptions for the insurer's exercise of discretion in those matters, the actuary would take policyholder reasonable expectations into account. Taking account of policyholder reasonable expectations may affect not only the amount of policy liabilities but also disclosure in the financial statements.

.32 The determination of policyholder reasonable expectations is straightforward when the insurer's practice has been clear, unvarying, consistent with its communications, consistent with general standards of market conduct, and the insurer does not intend to change it. The actuary would discuss any other practice with the insurer, with a view to clarifying policyholder reasonable expectations.

.33 If the insurer makes a change which will eventually alter policyholder reasonable expectations, then the actuary would consider both the appropriate disclosure of the change in policyholder communication and the financial statements, and the time elapsed before the altered expectations crystallize.

.34 A dispute over policyholder reasonable expectations may lead to class action or other litigation by policyholders against the insurer, which may affect policy liabilities or generate contingent liabilities.

Policyholder dividends

.35 The assumed cash flow from policyholder dividends would be that from both periodic (usually annual) dividends and terminal and other deferred dividends, but excluding that from the related transfers from the participating to the shareholders account in a stock insurer.

.36 The assumed cash flow from policyholder dividends would avoid omission and double counting with other elements of the policy liabilities and with liabilities other than policy liabilities. For example, if the actuary has valued the policy liabilities for riders and supplementary benefits in participating policies as though they were non-participating — i.e., with provision for adverse deviations in excess of that appropriate for participating insurance – then the assumed cash flow from policyholder dividends would exclude the portion of that excess which is included in the dividend scale.

.37 The selected policyholder dividend scales in a particular scenario would be consistent with the other elements of that scenario, but would take account of how insurer inertia, policyholder reasonable expectations, and market pressure may preclude the dividend scale from being responsive to changes assumed in the scenario. Those scales would also be consistent with the insurer's dividend policy except in a scenario which that policy does not contemplate and which would provoke a change in it.

.38 If the current dividend scale anticipates a future deterioration in experience, then the actuary would assume continuance of that scale in response to that deterioration. If the current dividend scale does not respond to a recent deterioration in experience but the insurer's policy is to do so, and if the delay in doing so does not provoke a contrary policyholder reasonable expectation, then the actuary would assume such response.

.39 An assumption of cash dividends to all policyholders is appropriate only if the alternative options to cash have equivalent value, failing which the actuary would

> either adjust the cash dividends to reflect the non-equivalence or make explicit assumption about policyholder exercise of the various dividend options, and
>
> provide for the anti-selection which will result from increasing exercise of the more valuable options.

Forecast of cash flow

.40 In calculating policy liabilities, the actuary would allocate assets to the liabilities at the balance sheet date, forecast their cash flow after that date, and, by trial and error, adjust the allocated assets so that they reduce to zero at the last cash flow.

.41 Use of the work of another person may be appropriate for forecasting the cash flow of certain assets, such as real estate. 1610

Income tax and alternative tax

.42 This item deals with cash flow from tax based on income (herein called "income tax") and other taxes not based on income but which interact with income tax; for example, certain capital taxes in Canada (herein called "alternative tax").

.43 The cash flow from such taxes would be limited to that in respect of the relevant policies and the assets which support their policy liabilities, and thus, with the exception of the recoverability of future tax losses described below would ignore any interaction between that cash flow and cash flow in the rest of the insurer; e.g., it would ignore tax on investment income from assets which support the insurer's capital. For a particular scenario, forecasted income before tax is equal to zero in each accounting period after the balance sheet date. That is so because that scenario assumes occurrence of the adverse deviations for which it makes provision. If income according to tax rules were equal to income in accordance with generally accepted accounting principles, and if there were no alternative tax, then the corresponding forecasted tax cash flow would also be equal to zero. In reality, however, such tax cash flow may differ from zero because of 2320.40

> differences—both temporary and permanent—between income in accordance with generally accepted accounting principles and in income in accordance with tax rules,
>
> the operation of carry-forward and carry-back in the tax rules, and
>
> alternative tax and the interaction between it and income tax.

.44 An example of a temporary difference is a difference between policy liabilities and the corresponding tax liabilities.

.45 An example of a permanent difference is a preferential tax rate on the investment income on a class of assets.

.46 The forecast of cash flow from such taxes would therefore take account of positive or negative tax as a result of permanent and temporary differences at, and arising after, the balance sheet date, and of alternative taxes incurred after the balance sheet date.

.47 The resulting policy liabilities make appropriate provision for cash flow on account of such taxes. If the insurer's balance sheet records a future tax asset or liability in respect of such taxes, then, in order to avoid double counting, the actuary would adjust the policy liabilities otherwise calculated upward to reflect the existence of the future tax asset and downward to reflect the existence of future tax liability.

.48 The realization of negative tax depends on the simultaneous availability of income which is otherwise taxable. In forecasting such income, the actuary would 2320.43

make provision for adverse deviations,

take into account the projected tax position of the company overall, but

not take account of the expected release of provisions for adverse deviations in the policy liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

Adverse deviations borne by policyholders

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

Adoption of a scenario

.50 If the selection of scenarios is deterministic, then the actuary would adopt a scenario whose policy liabilities are within the upper part of the range of the policy liabilities for the selected scenarios, provided, however, that the policy liabilities would not be less than those in the prescribed scenario with the largest policy liabilities.

.51 If the selection of scenarios is stochastic, then the actuary would adopt a scenario whose policy liabilities are within the range defined by

the average of the policy liabilities which are above the 60^{th} percentile of the range of policy liabilities for the selected scenarios, and

the corresponding average for the 80^{th} percentile.

Scenario-tested assumptions

1740.21

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

Other assumptions

.53 The provision for adverse deviations in respect of each assumption other than the scenario-tested assumptions results from a margin for adverse deviations included in that assumption.

.54 The assumptions unique to a particular scenario are the scenario-tested assumptions and each other assumption which is correlated with them. For example, policyholder dividends and the exercise of options by borrowers and issuers are strongly correlated with interest rates. Lapses may be correlated or not, depending on the circumstances. The assumption on a matter not so correlated would be common to all scenarios.

1740.39

Margin for adverse deviations

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

2330 SCENARIO ASSUMPTIONS: INTEREST RATES

Interest rate scenario

.01 An interest rate scenario comprises, for each forecast period between the balance sheet date and the last cash flow,

an investment strategy,

an interest rate for each default-free asset and the corresponding premium for each asset subject to default, and

an inflation rate consistent with those interest rates.

.02 The scenario would be consistent among the insurer's lines of business.

.03 The investment strategy defines reinvestment and disinvestment practice for each type, default risk classification, and term of the invested assets which support policy liabilities. Assumption of the insurer's current investment strategy implies investment decisions of reinvestment and disinvestment in accordance with that strategy and hence the risk inherent in that strategy.

.04 The investment strategy for each scenario would be consistent with the insurer's current investment policy. The policy liabilities would therefore make no provision for any increased risk which may result from a change in that policy.

.05 The number of assumed terms of assets would be large enough to permit assumption of changes in the shape and steepness of the yield curve. That implies a minimum of a short, a medium, and a long term.

.06 The plausible range of Canadian default-free interest rates is

from 3% to 10% for short term rates, and

5% to 12% for long-term rates

but, if 125% of the actual rate at the balance sheet date exceeds the high end rate of the plausible range above for the equivalent term, then the range would be extended upward to 125% of the actual rate for assumption of rates for forecast periods immediately following the balance sheet date. If 50% of the actual rate at the balance sheet date is less than the low end rate of the plausible range above for the equivalent term, then the range would similarly be extended downward to 50% of the actual rate for assumption of rates for forecast periods immediately following the balance sheet date.

.07 A scenario for a foreign country's interest rates would be formulated independently of that for Canadian interest rates unless their positive historical correlation is expected to continue.

.08 The scenarios would include those in which the premiums for default risk range from 50% to 200% of the actual premiums at the balance sheet date.

.09 The importance of the assumptions for a particular forecast period depends on the magnitude of the net forecasted cash flow for that period.

Prescribed scenarios

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

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

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

assume the reinvestment of any remainder in debt investments,

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

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

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

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

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

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

.16 The parameters in the prescribed scenarios apply to investments denominated in Canadian dollars. For each prescribed scenario, the actuary would determine the corresponding parameters for investments denominated in a foreign currency from the historical relationship between investments denominated in that currency and investments denominated in the Canadian dollar if the expected continuance of that relationship so permits. Otherwise the actuary would devise independent scenarios for investments denominated in that currency.

.17 For each prescribed scenario, the insurer's reinvestment strategy for debt instruments by type and term

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

at and after the 20th anniversary of the balance sheet date is default-free coupon bonds with a term of 15 years or less, and

between those two dates is according to a uniform transition from the balance sheet date distribution to default-free coupon bonds with a term of 15 years or less.

Prescribed scenario 1

.18 The interest rates for investments purchased

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

at and after the 20th anniversary of the balance sheet date are uniformly 5%, and

between those two dates is according to a uniform transition from the balance sheet date rates to 5%.

Prescribed scenario 2

.19 Same as prescribed scenario 1, with 12% substituted for the 5% interest rate at the 20th anniversary of the balance sheet date.

Prescribed scenario 3

.20 The long-term default-free interest rate moves cyclically in 1% steps between 5% and 12%. The first cycle is irregular: at the first anniversary of the balance sheet date, the rate is

> the next integral higher percentage if the actual rate at the balance sheet date is less than 12%, with the rate at subsequent anniversaries increasing in 1% steps to 12%, at which point the cycle continues regularly, and
>
> the next integral lower percentage if the actual rate at the balance sheet date is equal to or greater than 12%, with the rate at subsequent anniversaries decreasing in 1% steps to 12%, at which point the cycle continues regularly.

.21 The short-term default-free interest rate changes uniformly over a period, usually not more than three years, from that at the balance sheet date to 60% of the corresponding long-term interest rate, and thereafter remains at 60% of the corresponding long-term interest rate.

.22 Other interest rates are consistent with those long and short-term default-free interest rates.

Prescribed scenario 4

.23 Same as prescribed scenario 3, except that the first irregular cycle reaches 5% rather than 12%.

Prescribed scenario 5

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

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

after which the cycle continues regularly.

Prescribed scenario 6

.25 As respects long-term interest rate, same as prescribed scenario 4.

.26 As respects short-term interest rate, same as prescribed scenario 5, except that, at the first anniversary of the balance sheet date, the percentage is

the next step below the actual percentage at the balance sheet date if that actual percentage is more than 40%, and

40% otherwise.

Prescribed scenario 7

.27 Default-free interest rates after the balance sheet date are the forward interest rates implied by an equilibrium market yield curve at that date.

Other scenarios

.28 In addition to the prescribed scenarios, which are common to the calculation of policy liabilities for all insurers, the actuary would also select other scenarios which are appropriate to the circumstances of the case.

.29 For interest rate scenarios, the number of other scenarios would be relatively large to the extent that

the pattern of forecasted net cash flow in the base scenario is such that the classification of scenarios between favourable and unfavourable is unclear,

forecasted net cash flow is sensitive to the selection of interest rate scenarios,

the range of present values of forecasted net cash flow is wide, suggesting exposure to mismatch risk,

investment policy does not control mismatch risk,

asset-liability management is loose, or

flexibility to manage assets or liabilities is limited.

2340 OTHER ASSUMPTIONS: ECONOMIC

Margin for adverse deviations

.001 The following significant considerations indicate difficulties in properly estimating the best estimate assumption:

there is little relevant experience,

future experience is difficult to estimate,

operational risks adversely impact the likelihood of obtaining the best estimate assumption,

asset underwriting criteria are weak or poorly controlled,

there are liquidity concerns,

there is uncertainty regarding the credit enhancement techniques used,

the trust structure and legal responsibilities of the different parties for a securitized asset are not clearly understood in a practical and/or legal sense,

the asset held is from a non-passthrough structure with a repackaging of the credit risk that is difficult to understand,

the asset held is from a lower quality tranche of a non-passthrough structure that repackages credit risks,

there is uncertainty about the counterparty credit, or

there is no netting of the aggregate exposure with a counterparty.

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

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

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

Fixed income assets: investment return

.01 The forecast of cash flow from a fixed income asset would be the promised cash flow over the term of the asset, modified for asset depreciation and borrower and issuer options. 2340.02 2210.08

Fixed income assets: asset depreciation

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

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

subordination to other debt of borrower or issuer,

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

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

the insurance industry's experience,

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

potential for anti-selection by borrowers and issuers.

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

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

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

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

> a higher range is appropriate where those percentages of an unusually low best estimate are not meaningful, and
>
> zero is usually appropriate for an Organisation for Economic Cooperation and Development (OECD) government's debt denominated in its own currency.

.07 Repealed

Fixed income assets: exercise of borrower and issuer options

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

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

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

Non-fixed income assets: investment return

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

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

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

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

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

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

Taxation

.15 The best estimate would be for continuation of the tax regime at the balance sheet date, except that the best estimate should anticipate a definitive or virtually definitive decision to change that regime. The margin for adverse deviations would be zero. 1520.06

Foreign exchange

.16 The needed assumptions would include foreign exchange rates when policy liabilities and their supported assets are denominated in different currencies.

.17 The best estimate would be for continuance of the foreign exchange rates at the balance sheet date, except that the best estimate should anticipate any imminent unfavourable devaluation. There would be a provision for adverse deviations in respect of a currency mismatch.

2350 OTHER ASSUMPTIONS: NON-ECONOMIC

Margin for adverse deviations

.01 The actuary would select a margin for adverse deviations between a low margin and a high margin 1740.39

specified for each best estimate assumption discussed below, and

of 5% and 20% (or –5% and –20%) respectively of each other best estimate assumption.

.02 Provided, however, that, if a margin for adverse deviations cannot be defined as a percentage of the best estimate assumption, then the related provision for adverse deviations would be taken as the increase in policy liabilities which results from substitution of a conservative assumption for the best estimate assumption.

.03 The following significant considerations indicate difficulties in properly estimating the best estimate assumption:

the credibility of the company's experience is too low to be the primary source of data,

future experience is difficult to estimate,

the cohort of risks lack homogeneity,

operational risks adversely impact the likelihood of obtaining best estimate assumption, or

the derivation of the best estimate assumption is unrefined.

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

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

operational risks adversely impact the likelihood of continuing to obtain best estimate assumption, or

past experience may not be representative of future experience and the experience may deteriorate.

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

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

Insurance mortality

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

the life insured's age, sex, smoking habit, health, and lifestyle,

duration since issue of the policy,

plan of insurance and its benefits provided,

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

the size of the policy, and

the insurer's distribution system and other marketing practice,

and would include the effect of any anti-selection.

1730.18

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

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

.08 Repealed

Annuity mortality

.09 The actuary's best estimate assumption of annuity mortality would depend on

the annuitant's age, sex, smoking habit, health, and lifestyle,

size of premium,

plan of annuity and its benefits provided, and

whether registered or not, whether structured settlement, and whether group or individual contract,

and would include the effect of any anti-selection resulting from the annuitant's option to select the timing, form, or amount of annuity payment, or to commute annuity payments. 1730.18

.10 The insurance underwriting in a "back-to-back" insurance/annuity package may unfavourably affect the best estimate.

.11 It is prescribed that the actuary's best estimate includes a secular trend toward lower mortality rates as promulgated from time to time.

.12 The low and high margins for adverse deviations are respectively a subtraction of 5% and 15% of the best estimate.

.13 An additional significant consideration for the determination of the level of margin for adverse deviations is the possibility of commuting survival dependent benefits after periodic payments have started. 2350.01

Morbidity

.14 The actuary's best estimate of insurance morbidity would depend on

the life insured's age, sex, smoking habit, occupation, industry, health, and lifestyle,

duration since issue of the policy,

in the case of income replacement insurance, definition of disability, unemployment levels, and, in the case of an outstanding claim, cause of disability,

plan of insurance and its benefits provided, including elimination period, guarantees, deductibles, coinsurance, return-of-premium benefits, and benefit limits, indexation, and offsets,

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

the insurer's administration and claim adjudication practice,

the size of the policy,

seasonal variations,

in the case of group insurance, participation level, and

environmental factors, such as a change in the offset to government benefits, 1730.18

and would include the effect of any anti-selection.

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

.16 Repealed

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

.18 The following additional significant considerations are taken into account when determining the level of margin for adverse deviations: 2350.01

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

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

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

Withdrawal and partial withdrawal

.19 The actuary's best estimate of withdrawal rates would depend on

policy plan and options,

the life insured's attained age,

duration since issue of the policy,

method of payment and frequency of premiums,

premium paying status,

policy size,

the policy's competitiveness, surrender charges, persistency bonuses, taxation upon withdrawal, and other incentives and disincentives to withdrawal,

policyholder and sales representative sophistication,

the insurer's distribution system and its commission, conversion, replacement, and other marketing practices, and

the interest rate scenario,

and would include the effect of any anti-selection. 1730.18

.20 The insurer's withdrawal experience is pertinent and usually credible. It is not available for new products and for higher durations on recent products, which is a problem for the actuary if their policy liabilities are sensitive to withdrawal rates.

.21 The automatic payment of insurance premiums by the annuity benefit in a "back-to-back" insurance/annuity package is a disincentive to withdrawal.

.22 Reinsurance assumed withdrawal rates depend on practice in the direct insurer.

.23 A "cliff" is a sudden significant increase in the benefit available at withdrawal. That increase may result from increase in cash value, decrease in surrender charge, or availability of a maturity benefit or persistency bonus. Unless there is pertinent persistency experience data to the contrary, the actuary's best estimate withdrawal rates would grade to zero as the cliff approaches and remains at zero for an interval before the cliff is reached. The same applies to a return of premium benefit in life insurance and to one in accident and sickness insurance, with modification in the latter case if the benefit is contingent upon zero claims or reduced by the amount of claims.

.24 The actuary's best estimate withdrawal rate would be zero for a paid-up policy without non-forfeiture benefit.

.25 The low and high margins for adverse deviations are respectively an addition or subtraction, as appropriate, of 5% and 20% of the best estimate withdrawal rates. In order to ensure that the margin for adverse deviations increases policy liabilities, the choice between addition and subtraction may need to vary by interest scenario, age, policy duration, and other parameters. In the case of partial withdrawal, two assumptions are needed – the amount withdrawn and the partial withdrawal rate. 2350.01 1740.47

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

the remuneration policy encourages persistency, or

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

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

the remuneration policy encourages terminations,

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

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

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

Anti-selective lapse

.27 Strictly speaking, "lapse" means termination of a policy with forfeiture, but in the context of anti-selection has come to include any termination or the election of the extended term insurance non-forfeiture option. "Anti-selective lapse" is a tendency of healthy policyholders to lapse or unhealthy policyholders not to lapse, with a concomitant deterioration in the insurer's mortality or morbidity experience. To determine whether the tendency has operated in a particular case requires either a re-underwriting of those who have lapsed and those who

have not, or a study of the mortality among those who lapsed, neither of which is likely to be practical. Policyholders will, however, make decisions in their own perceived interest, so that anti-selective lapse is plausible whenever that perceived interest is for unhealthy policyholders not to lapse or for healthy policyholders to lapse.

.28 It is difficult to estimate with confidence the intensity of anti-selective lapse. It is plausible that the intensity will be proportional to the intensity of policyholder perceived interest. However anti-selective lapse is merely a **tendency** provoked by the policyholder's **perceived** interest. The policyholder may not know the true state of his or her health. The policyholder may imprudently favour or be obliged by financial pressure to adopt a short-term interest with long-term detriment; thus, an unhealthy policyholder may lapse when the premium increases, perceiving the policy as no longer affordable. Through ignorance or inertia, a healthy policyholder may continue a policy which could be replaced by a superior one. Moreover, anti-selective lapse is not the unvarying effect of a decision in the policyholder's perceived interest: an unhealthy policyholder may lapse a policy no longer needed for which the healthy policyholder perceives continuing need. Without pertinent and reliable experience, however, the actuary would not assume that the non-lapsation of healthy policyholders favourably affects the best estimate for the persisting policyholders.

.29 The premise to the actuary's assumptions would be that policyholder decisions

will tend to serve their perceived interest, and

not serve the insurer's interest unless the two run together.

.30 Here are examples where the perceived interest of the healthy policyholder may be to lapse: 1730.18

a premium increase at renewal of term insurance,

an unfavourable underwriting decision at renewal of re-entry term insurance,

a benefit decrease or premium increase of adjustable insurance,

a premium needed to avoid termination of universal life insurance with exhausted funding,

a reduction in policyholder dividend scale,

an offer or availability of a superior replacement policy, such as by the creation of a preferred underwriting class,

a significant but temporary increase (spike) in non-forfeiture value, and

a downgrade in the insurer's credit rating.

Expense

.31 The actuary would select a best estimate assumption which provides for the expense of the relevant policies and their supporting assets, including overhead. The insurer's other expense is irrelevant to the valuation of policy liabilities. Other expense includes

> expense related to policies which, for the relevant policies, was incurred before the balance sheet date, such as marketing and other acquisition expense, and
>
> expense not related to the relevant policies and their supporting assets, such as investment expense for the assets which support capital.

.32 The assumption would provide for future expense inflation consistent with that in the interest rate scenario. 2330.01

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

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

.35 Investment expense comprises

> administration expense, both internal and external,
>
> expense related to investment income, such as deferred fees and commissions and direct taxes, and
>
> interest on money borrowed to finance investment.

.36 The insurer incurs neither cash rental expense nor cash rental income on real estate which it owns and occupies. The actuary would deem such expense and, if the real estate supports the policy liabilities, such income at a reasonable rate in the selection of an assumption of expense and investment return.

.37 Certain taxes are akin to expenses. The actuary would make similar provision for them in the policy liabilities to the extent that they relate to the relevant policies and their supporting assets. They include both premium taxes, which are straightforward, and taxes whose basis is neither income nor net income but which may be complicated by a relationship with income tax; for example, those currently incurred may be offset against later income tax. 2320.42

.38 The low and high margins for adverse deviations are respectively 2.5% and 10% of best estimate expense including inflation thereof. No margin for adverse deviations is needed for a tax, such as premium tax, whose history has been stable.

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

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

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

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

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

Policyholder options

.40 Examples of policyholder options are an option

to purchase additional insurance,

to convert term to permanent insurance,

to select the extended term insurance non-forfeiture option,

to make partial withdrawal from a universal life insurance policy,

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

to purchase an annuity at a guaranteed rate.

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

.42 The actuary's best estimate would depend on

the life insured's attained age,

duration since issue of the policy,

plan of insurance and its benefits provided,

historical premium payment patterns,

method of premium payment,

sophistication of the policyholder and the intermediary,

perceived self-interest of the policyholder and the intermediary,

the policy's competitiveness, and

the insurer's distribution system and other marketing practice,

and would make provision for anti-selection.

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

2400 THE APPOINTED ACTUARY

2410 DEFINITIONS

.01 In sections 2400 and 2500, "senior management" means

> in the case of a Canadian insurer, both the chief executive officer and the chief financial officer, and,
>
> in the case of a foreign insurer, both the Chief Agent for Canada and the person designated by the insurer as having responsibility for its Canadian operation.

.02 In this section 2400, "directors" means an insurer's Board of Directors and, in the case of a foreign insurer, includes the person whom they designate as responsible for the insurer's Canadian branch.

2420 SCOPE

.01 The standards in this section 2400 apply to an appointed actuary who, pursuant to

> the federal *Insurance Companies Act*, is the actuary of a company or society,
>
> the federal *Insurance Companies Act*, is the actuary of the Canadian branch of a foreign company, or
>
> a provincial Act, has the access to information, protection against civil liability, and duties in an insurer which are substantially the same as those of the appointed actuary in the federal *Act*.

2430 EXTENSION OF SCOPE

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

2440 ACCEPTING AND CONTINUING AN ENGAGEMENT

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

1400

Qualifications, experience, and knowledge

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

.03 An actuary accepting an engagement for the first time may wish to arrange professional, formal, and timely access to another actuary with experience as an appointed actuary.

.04 It is important that the insurer's directors understand and accept the actuary's role and its requirements for time, resources, and access to information. The actuary may wish written confirmation of the understanding and acceptance unless the role is part of the insurer's corporate culture.

Information needed

.05 The information necessary for the work consists of the records, accounts, documents, and oral briefings which provide an understanding of the insurer's operations, its obligations and the resources available to meet those obligations. That information includes

files of inforce policies and outstanding claims, including their reinsurance,

policy provisions and other communications with policyholders,

past experience data,

past financial data,

communications with auditors and regulators,

pricing practice,

underwriting practice,

claims settlement practice (including case estimate practice) and cost,

asset-liability management practice, and

capital management practice.

.06 The process to identify and assure timely receipt of that information includes

an understanding of the insurer's decision making,

continual communication with members of management who can supply information, and

continual communication with the auditor in accordance with the CIA/CICA *Joint Policy Statement*. 1630

2450 REPORT ON MATTERS REQUIRING RECTIFICATION

.01 *The actuary should identify and monitor matters which may threaten the insurer's financial condition. The actuary should investigate and then report any such matter which requires rectification to the senior management and, in the case of a Canadian insurer, send a copy of the report to the directors. The report may include recommendations for rectification and should specify a deadline for rectification which the actuary may later extend if appropriate. If there is no suitable rectification by that deadline or its extension, then the actuary should report the matter to the insurer's regulator.* [Effective January 1, 2003]

.02 The sensitivity of financial condition to adverse conditions and events varies among insurers. For example, an increase in withdrawal rates among policies may be devastating in one life insurer and may be beneficial in another. Financial condition, and hence the magnitude of the conditions and events which may threaten it, also varies among insurers.

.03 The frequency and intensity of the monitoring depend on the threatening conditions and events and on the circumstances of the insurer. A quarterly review would usually be a minimum.

.04 There would be no such report to senior management of an adverse condition which does not threaten the insurer's financial condition. Informal notification and consultation would usually precede, and may obviate, that report to senior management.

.05 That report would describe the threatening condition or event and the methods and assumptions in the actuary's investigation of it. It is desirable that the report includes recommendations for its rectification.

.06 The deadline would allow time which is reasonable in the circumstances to arrange rectification.

.07 The report to the regulator would describe the actuary's investigation, the report to senior management, and senior management's response to that report. The actuary would advise the directors of the report to the regulator.

2460 REPORT TO THE DIRECTORS

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

> *on the insurer's financial position and financial condition and,* 2500
>
> *if the insurer has a participating account, on the allocation of income among accounts and on the dividend policy and dividend scales for the participating policyholders.*

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

Allocation of income

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

Dividend policy and dividend scale

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

2470 COMMUNICATION WITH THE AUDITOR

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

2500 DYNAMIC CAPITAL ADEQUACY TESTING

2510 SCOPE

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

2520 INVESTIGATION

.01 *The actuary should make an annual investigation of the insurer's recent and current financial position, and financial condition, as revealed by dynamic capital adequacy testing for various scenarios.*

.02 *The actuary should make a report of each investigation in writing to the insurer's Board of Directors (or to their audit committee if they so delegate) or Chief Agent for Canada. The report should identify possible actions for dealing with any threats to satisfactory financial condition which the investigation reveals.*

.03 The actuary should also make an interim investigation if there is a material adverse change in the insurer's circumstances. [Effective January 1, 2003]

2530 METHOD

Recent and current financial position

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

Dynamic capital adequacy testing

.02 Dynamic capital adequacy testing examines the effect of various plausible adverse scenarios on the insurer's forecasted capital adequacy. It is the actuary's primary tool for investigation of an insurer's financial condition.

.03 The purpose of dynamic capital adequacy testing is to identify plausible threats to satisfactory financial condition, actions which lessen the likelihood of those threats, and actions which would mitigate a threat if it materialized.

.04 Dynamic capital adequacy testing is defensive: it addresses threats to financial condition rather than the exploitation of opportunity.

Satisfactory financial condition

.05 The insurer's financial condition is satisfactory if throughout the forecast period it is able to meet all its future obligations under the base scenario and all plausible adverse scenarios, and under the base scenario it meets the minimum regulatory capital requirement.

.06 The minimum regulatory capital requirement is the requirement imposed by the regulator requiring the actuary's report on the insurer's financial condition. In 2001, for example, for insurers regulated under the federal *Insurance Companies Act*, the minimum regulatory capital requirement is based upon the Minimum Asset Test (MAT) for a Canadian property and casualty insurer, the Minimum Continuing Capital and Surplus Requirement (MCCSR) for a Canadian life insurer, the Test of Adequacy of Assets in Canada and Margin Requirements (TAAM) for a Canadian branch of a foreign life insurer, and the Test of Adequacy of Deposits (TAD) for a Canadian branch of a foreign property and casualty insurer. For insurers regulated under provincial legislation, the minimum regulatory capital requirement is based upon such similar provincial requirement.

Forecast period

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

Scenarios

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

Base scenario

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

Plausible adverse scenarios

.10 A plausible adverse scenario is a scenario of adverse, but plausible, assumptions about matters to which the insurer's financial condition is sensitive. Plausible adverse scenarios vary among insurers and may vary over time for a particular insurer.

.11 The actuary would consider plausible material risks to the insurer. Scenario testing may be required for the actuary to determine the sensitivity of the insurer's capital adequacy to each risk. It is expected that the actuary would scenario test and report annually on the base scenario, and a minimum of three plausible adverse scenarios posing the greatest risk for the insurer. Fewer than three adverse scenarios may be reported only in the rare event that it is not possible to develop three plausible adverse scenarios.

.12 For life insurers, the actuary would consider threats to capital adequacy under plausible adverse scenarios that include but are not limited to the following risk categories:

mortality,

morbidity,

persistency,

cash flow mismatch (C-3 risk),

deterioration of asset values (C-1 risk),

new business,

expense,

reinsurance,

government and political action, and

off balance sheet.

.13 For property and casualty insurers, the actuary would consider threats to capital adequacy under plausible adverse scenarios that include but are not limited to the following risk categories:

frequency and severity,

pricing,

misestimation of policy liabilities,

inflation,

interest rate,

premium volume,

expense,

reinsurance,

deterioration of asset values (C-1 risk),

government and political action, and

off balance sheet.

.14 To help the actuary determine if a risk is material and plausible, it may be useful to stress test the capital adequacy of the insurer. The actuary might determine how much a base scenario assumption needs to be changed before an adverse scenario gives rise to an unsatisfactory financial condition. The actuary can then judge whether a plausible risk or event exists for the insurer over the forecast period.

Integrated scenarios

.15 In many cases, plausible adverse scenarios are associated with a low probability of occurrence. In such cases, it is usually not necessary for the actuary to construct integrated scenarios by combining two or more low probability adverse scenarios.

.16 In some cases, however, the probability associated with a plausible adverse scenario may be close to the probability associated with the base scenario. For example, a significant asset on the balance sheet may be showing early signs of distress. In such cases, an integrated scenario would be constructed by combining each more probable adverse scenario, with a low probability adverse scenario. The low probability adverse scenario selected would be the one that has the greatest effect on the insurer's financial condition and is plausible when combined with the more probable adverse scenario.

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

Ripple effects

.18 In assuring consistency within each scenario, the actuary would consider "ripple" effects. Although most of the other assumptions used in the base scenario may remain appropriate under the plausible adverse scenario, some may require adjustment to reflect the interdependence of assumptions in the plausible adverse scenario.

.19 Ripple effects include both regulatory action and policyholder action especially under any plausible adverse scenario where the insurer fails to meet the minimum regulatory capital requirement. In assessing potential regulatory action, the actuary would consider actions that could be taken by the Canadian regulator as well as 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.

.20 Ripple effects also include the insurer's expected response to adversity. Selection of the assumptions for that response would take into account:

the effectiveness of the insurer's management information systems,

the insurer's historical record of promptness and willingness to make difficult decisions, when faced with adversity, and

the external environment assumed in the scenario.

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

Scope of the investigation and report

.21 The report would contain the key assumptions of the base scenario and the plausible adverse scenarios posing the greatest risk to the satisfactory financial condition of the insurer. The report would also include comments on each of the risk categories identified in this standard. The meaning of satisfactory financial condition under this standard would be disclosed in the report.

.22 The report would also contain the plausible adverse scenarios examined which cause the insurer to fall below the minimum regulatory capital requirement. Even though the actuary may have signed a satisfactory financial condition opinion, the report would make it clear that under these scenarios the regulators may impose restrictions on the operations of the insurer, including its ability to write new business.

.23 If the investigation identifies any plausible threat to satisfactory financial condition, then the actuary would attempt to identify extraordinary management action which would lessen the likelihood of that threat, or which would mitigate that threat, if it materialized. For each such plausible adverse scenario reported upon, the actuary would report the results with the insurer's expected response to adversity but before extraordinary management action, and additionally including the effect of any extraordinary management action. The actuary would report the extraordinary management action so that users may consider its practicality and adequacy. 2530.20

Revaluation of the policy liabilities

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

Interim investigation

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

2540 REPORTING

.01 In the case of a Canadian insurer, the actuary would report to the Board of Directors or to their audit committee if they so delegate. In the case of a Canadian branch of a foreign insurer, the actuary would report to the Chief Agent for Canada and may also report to the responsible senior executive in the parent head office.

.02 In order to give the insurer's senior management an opportunity to react to the results of the investigation, the actuary would normally discuss the report with the insurer's senior management in advance of its submission to the Board of Directors or Chief Agent for Canada.

.03 The report would be in writing, but an additional oral report which permits questions and discussions is desirable. An interpretative report is more useful than a statistical report.

.04 The timing of the report would depend on the urgency of the matters reported and on the desirability of integrating dynamic capital adequacy testing into the insurer's annual financial planning cycle. The annual report would be submitted within twelve months of each fiscal year-end.

2550 OPINION

.01 *The report should contain an opinion signed by the actuary. The purpose of the opinion is to report on the financial condition of the insurer.* [Effective January 1, 2003]

.02 In this opinion, "future financial condition" has the same meaning as "financial condition." The actuary may use the words "future financial condition" in order to comply with legislation or regulation in some jurisdictions.

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

> "I have completed my annual investigation of the [future] financial condition of [company name] as at [date] in accordance with accepted actuarial practice.
>
> I have analyzed the forecasted financial positions of the company during the [number] year forecast period under a series of scenarios. A description of these scenarios and their impact on the company is included within this report.
>
> The analysis incorporates assumptions relating to business growth, investments, [mortality, morbidity, claims frequency, capital injections, other policy-related experience] and other internal and external conditions during the forecast period as well as potential management responses to various plausible adverse scenarios. The most significant assumptions are described within this report.
>
> In my opinion, the [future] financial condition of the company [is satisfactory under these assumptions or is not satisfactory for the following reason(s)…].
>
> [Montréal, Québec] [Mary F. Roe]
>
> [Report date] Fellow, Canadian Institute of Actuaries