

HEALTH PRACTICE COUNCIL PRACTICE NOTE

March 2006

STATUTORY RESERVES FOR
INDIVIDUAL DISABILITY INCOME INSURANCE

Prepared by the
Health Practice Financial Reporting Committee
of the American Academy of Actuaries



AMERICAN ACADEMY *of* ACTUARIES



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Introduction

The original practice note was prepared by a work group organized by the Committee on State Health of the American Academy of Actuaries. The work group was charged with developing a description of some of the current statutory reserving practices used by individual disability income actuaries in the United States. Originally written in 1995, this practice note was updated by a new work group of the Health Practice Financial Reporting Committee of the American Academy of Actuaries.

This practice note represents a description of practices the work group believes to be commonly employed by individual disability income actuaries in the United States. The purpose of this practice note is to assist actuaries who are faced with the requirement of preparing statutory reserves or a statement of opinion for individual disability insurance products by providing examples of some of the common approaches to this work. Many of these practices may apply to GAAP and tax reserving practices as well, though GAAP and tax reserving practices are outside the scope of this note. No representation of completeness is made; other approaches may also be in common use. It should also be recognized that though the information contained in practice notes provides advisory, non-binding guidance, it is not a definitive statement of what constitutes generally accepted practice in this area. Events occurring subsequent to the publication of this Practice Note may make the practices described herein irrelevant or obsolete. This practice note has not been promulgated by the Actuarial Standards Board, nor is it binding on any actuary.

The members of the work group responsible for this practice note are Robert W. Beal, chairperson; Richard N. Ferree, Douglas W. Taylor, and Paul G. Ziobrowski. The original work group was David E. Scarlett, chairperson; Robert W. Beal, Albert A. Riggieri, Jr.; and Robert J. Shlifer.

Comments are welcome as to the appropriateness of this practice note, frequency of updates, substantive disagreements, etc. Comments should be sent to Geralyn Trujillo, the Academy's state health policy analyst, at the directory address.

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Guidance

Q. What does this practice note address?

A. This practice note addresses questions and issues regarding the valuation actuary's responsibilities for compliance with the NAIC *Health Insurance Reserves Model Regulation* (hereafter the *HIR Model Regulation*), the NAIC model *Actuarial Opinion and Memorandum Regulation (AOMR)*, the NAIC's *Statements of Statutory Accounting Principles (SSAPs)*, and the Actuarial Standards Board's Actuarial Standards of Practice (ASOPs) related specifically to determining adequate statutory reserve levels and asset adequacy for individual disability insurance coverage.

While many valuation issues are common to life and health insurance in general, the degree of emphasis varies by type of business, and each product type presents its own unique problems, responses, methods, and bases for setting assumptions. This is one of several health insurance product practice notes that has been compiled to provide guidance to actuaries.

The actuary may wish to refer to the *General Considerations Health Practice Note* to review valuation issues common to many health insurance product lines that may not be addressed in this Note.

Q. Which regulations apply to disability reserves?

A. The *HIR Model Regulation*, the purpose of which is to implement the Standard Valuation Law (SVL) and the *AOMR*. To the extent that the laws of a particular state differ from the NAIC models, practices described in this practice note may not be appropriate for actuarial practice in that state.

The *HIR Model Regulation* defines minimum reserves based on prescribed assumptions and methods. For reserves based on tabular methods, a company may choose to hold reserves in excess of the defined basis. The *HIR Model Regulation* also specifies circumstances under which reserves must be tested using a gross premium valuation.

The *AOMR* requires that a company appoint an actuary to evaluate its reserves, to consider the assets backing those reserves, and to set up any additional reserves the appointed actuary deems necessary. The *AOMR* sets requirements for the appointed actuary and for the appointed actuary's report.

Q. Which ASOPs apply to basic disability reserves?

A. The following Actuarial Standards of Practice normally apply:

- ASOP No. 5, *Incurred Health and Disability Claims*.
- ASOP No. 7, *Analysis of Life, Health or Property/Casualty Insurer Cash Flows*.
- ASOP No. 22, *Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers*.
- ASOP No. 23, *Data Quality*.

- ASOP No. 25, *Credibility Procedures Applicable to Accident and Health, Group Term Life, and Property/Casualty Coverages*.
- ASOP No. 41, *Actuarial Communications*.
- ASOP No. 42, *Determining Health and Disability Liabilities Other Than Liabilities for Incurred Claims*.

Q. What other guidance is available?

A. The following documents also apply:

- SSAP 54, *Individual and Group Accident and Health Contracts* establishes statutory accounting principles for income recognition and reserves.
- SSAP 55, *Unpaid Claims, Losses, and Loss Adjustment Expenses* establishes statutory accounting principles for recording liabilities for unpaid claims and claim adjustment expenses.
- All related SSAP appendices — in particular, A-010 (*Minimum Reserve Standards for Individual and Group Health Insurance Contracts*), A-820 (*Minimum Life and Annuity Reserve Standards*) and A-822 (*Asset Adequacy Analysis Requirements*).
- *NAIC Health Reserves Guidance Manual* provides guidance regarding the calculation and documentation of health reserves for statutory financial statements as described in the NAIC's Health Insurance Reserves Model Regulation.
- Annual Statement Instructions for Life, Accident and Health Insurers.
- Specific statutes and regulations of the company's state of domicile for which reserves and liabilities are being established or reviewed.

Definitions

Individual Disability Insurance (IDI) Business

In general, individual disability insurance includes all disability (loss of time) insurance, except disability insurance products classified as group accident and health or group credit insurance for statutory statement purposes and waiver of premium benefits, which are not included as IDI coverage in this Practice Note.

This practice note has been written to cover many of the standard IDI valuation issues. It does not address some of the less common product provisions and questions that may arise.

Reserves and Liabilities

The terms “Reserves” and “Liabilities” are generally used as defined in the NAIC Life and Health Annual Statement. This usage differs from ASOP 5, which generally uses the term “Liabilities” to cover both reserves and liabilities. At times the term “Reserves” may also include liabilities as defined by the NAIC Life and Health Annual Statement.

- Reserves represent the present value of benefits and expenses accruing after the valuation date, less any premiums. Accident and Health (A&H) reserves are recorded in the NAIC Life & Health Annual Statement Exhibit 6 (formerly Exhibit 9).
- Liabilities are amounts that accrued on or before the valuation date. A&H liabilities are recorded in the NAIC Life & Health Annual Statement Exhibit 8 (formerly Exhibit 11).

Active Life Reserves

Active life reserves include the following components:

- *Contract reserves*, sometimes referred to as *policy reserves*, are reserves established on all in-force policies so that a portion of the premium collected in years before the valuation date is meant to help pay for higher claim costs arising in later years.
- *Unearned premium reserves*, sometimes referred to as *premium reserves*, are reserves established based on that portion of the net or gross premiums due before the valuation date that applies to a time after the current valuation date.
- *Premium deficiency reserves* are reserves established as a result of reserve adequacy analysis when, for a period of time, the present value of future premiums, current reserves, and unpaid claims liability is less than the present value of future claim payments and expenses, plus the anticipated reserves at the end of the period.
- *Additional actuarial reserves as the result of asset/liability analysis* are additional reserves that may be established as a result of the actuary’s asset adequacy analysis.

Claim Reserves

Claim reserves, sometimes referred to as *disabled life reserves*, are reserves established based on the present value of future benefit payments accruing after the valuation date on claims incurred before the valuation date. Claim reserves are determined for the following categories of claims:

- *Reported claims* — claims for which the company has received notice as of the valuation date. These include:

Approved claims — claims for which the company has accepted liability.

In Course Of Settlement (ICOS) claims — claims for which the company has not yet determined whether it is liable. This category of claims is sometimes referred to as “pending.”

(Note: for the purpose of valuation, some actuaries distinguish between approved claims and ICOS, based on whether payments have been made.)

Resisted claims — claims for which the company believes it does not have liability, but the claimant disagrees, i.e., the company is resisting the claim. Resisted claims include claims in litigation.

- *Incurred But Not Reported claims (IBNR)* — claims that are incurred on or before the valuation date but have not been reported by the insured to the company.
- *Future re-open claims* — previously reported claims that have terminated before the valuation date, but will re-open subsequent to the valuation date.

Claim Liabilities

Claim liabilities represent an estimate of claims that have been incurred and accrued before the valuation date, but not yet paid. As stated above for claim reserves, they also are determined from:

- Reported claims
 - Approved claims
 - Claims in course of settlement
 - Resisted claims
- IBNR claims

In practice, the development of the claim reserves and claim liabilities may be calculated simultaneously without distinguishing between the accrued and unaccrued components (i.e., claim liability vs. claim reserve pieces). The components may be allocated between Exhibits 6 and 8 based on historical development factors or some other allocation method. Factors will usually vary between that used for IBNR and those used for known claims. This allocation may impact certain financial results such as federal income tax and required risk-based capital (RBC).

Claim Expense Reserves

Claim expense reserves are reserves established based on the present values of future claim adjudication and administration expenses.

Reserve Testing

Gross Premium Valuations calculate reserves as the present value of future liability cash flows and ending reserves on a block of business. The valuation actuary typically develops assumptions for the gross premium valuation based on realistic expectations, which may or may not contain margins for adverse deviation. Cash flows include gross premiums, benefit payments, and expenses.

Reserve Adequacy Analysis compares the reserve based on a gross premium valuation and expected future liability cash flows, with the calculated active life and claim reserves. Reserve adequacy analysis typically uses best estimate assumptions, i.e., without margins for adverse deviation.

Asset Adequacy Analysis, tests the adequacy of reserves and related actuarial items, in light of the assets supporting them. The most common method for performing asset adequacy analysis is cash flow testing. However, ASOP No. 22 states that other methods may be available to the actuary to analyze asset adequacy besides cash flow testing.

Claim Reserve Runoff Analysis tests the adequacy of claim reserves over time by comparing the actual benefit payments and ending reserves with the beginning reserves. This may be performed taking into account interest on the reserves. Examples of this type of test (without interest) appear in NAIC Life & Health Annual Statement Schedules H and O.

Other Terms

Written premiums - paid premiums, less premium refunds, plus the increase in premiums due and unpaid.

Earned premiums - written premiums, less the increase in unearned premium reserves, less the increase in advance premium.

Due and unpaid premiums - premiums that were due before the valuation date but were not paid by that date. This item is an asset in the NAIC Life & Health Annual Statement. Due and unpaid premiums may be held on either a gross or valuation net basis. If they are held on a gross basis, a liability would normally be held for the commissions thereon. According to SSAP No. 6, only unpaid premiums due within 90 days of the valuation date may be admitted.

Advance premiums - premiums that were due after the valuation date but were paid before then. Advance premiums are held on a gross basis only.

Incurred claims - benefit payments plus increases in claim reserves over a specified period of time.

Interest-adjusted loss ratio - (a) divided by (b), where

- a) is equal to incurred claims plus the increase in active life reserves, excluding unearned premium reserves reduced by assumed interest on active life and claim reserves, and
- b) is equal to earned premiums.

General Reserving Practices

General

Q. What types of reserves does the *HIR Model Regulation* require companies to hold?

A. Active life reserves, claim reserves, and claim expense reserves.

Q. How is the test of statutory minimum reserves applied relative to bases prescribed by the *HIR Model Regulation*?

A. In addition to satisfying adequacy testing, reserves should equal or exceed the specified minimums in the aggregate, combining active life and claim reserves, but excluding claim expense reserves. Section 4D of the *HIR Model Regulation* also requires active life reserves to be equal to or exceed the prescribed bases alone (i.e., without claim reserves). Generally, companies test active life and claim reserves against their respective statutory minimums separately.

Q. What level of conservatism is appropriate to include in the reserves?

A. Under ASOP 5 and ASOP 22, statutory reserves should contain margins that can withstand moderately adverse conditions. SSAP No. 55 requires “best estimate claim liabilities” that health actuaries have generally interpreted to include margins in compliance with the ASOPs. The *NAIC Health Reserves Guidance Manual* provides additional clarification. Determination of such margins requires the valuation actuary to exercise professional judgment.

Q. What does an actuary normally consider when setting reserve assumptions?

A. There are a variety of factors that have resulted in differences when determining reserves, including, but not limited to, the following:

1. Differences in benefits and policy provisions
2. Marketing and underwriting
3. Quantity and quality of industry- and company-specific disability data
4. Size of the individual disability business relative to other lines
5. Systems and resources available to support the individual disability business
6. Claim administration practices

Active Life Reserves

Q. When does the actuary usually calculate contract reserves?

A. When contracts have level premiums, the actuary usually calculates contract reserves. More generally, based on the gross premium pricing structure at issue, when the present value of future benefits exceeds the present value of future net valuation premiums, the actuary normally calculates a contract reserve. This condition applies regardless of the gross premium pattern, and may involve policies with step-level or annual renewable term premiums having contract reserves.

Q. Are the methods used to calculate active life reserves for guaranteed renewable policies different from those for noncancelable policies?

A. The fact that insurers have the right to change the premium on guaranteed renewable contracts does not preempt the *HIR Model Regulation*'s requirement for active life reserves on level premium policies, using basically the same methods as for noncancelable products. When reserving for guaranteed renewable contracts, the actuary may choose to apply less conservative assumptions and margins than corresponding noncancelable contracts. The *HIR Model Regulation* provides some flexibility in the choice of policy termination rate assumptions for the calculation of minimum reserves for guaranteed renewable policies. This is discussed later in this practice note.

Q. What are the normal bases for statutory minimum active life reserves?

A. Morbidity – The morbidity bases are described in the *HIR Model Regulation* for the purpose of calculating active life reserves. These bases are 1964 Commissioners Disability Table (64 CDT), 1985 Commissioners Individual Disability Table A (85 CIDA) and 1985 Commissioners Individual Disability Table B (85 CIDB). The morbidity basis for newer issues is the 85 CIDA. The 85 CIDB is not commonly used. The morbidity basis for older policies issued after Jan. 1, 1965 is the 64 CDT. There is no NAIC-prescribed basis for issues before this date. The issue year that companies switched from the 64 CDT to 85 CIDA varies by company and state of domicile.

The 64 CDT table recognizes differences in morbidity by attained age only. The 85 CIDA table recognizes differences in morbidity by attained age, sex, occupation class, and elimination period. The actuary usually matches the occupation classes of the in-force policies to the class description pertinent to the 85 CIDA table.

Interest – Maximum interest rates, which vary by year of issue, are defined in the *HIR Model Regulation* and are equal to the whole life insurance statutory maximum interest rates (i.e., guarantee duration of longer than 20 years).

Policy Terminations – For policies with guaranteed premiums, policy termination assumptions are based on statutory mortality tables used in the valuation of life insurance, and vary by year of issue. For newer issues, the mortality basis is the 80 CSO table. Older issues use the 58 CSO. The issue year in which companies switched from the 58 CSO to 80 CSO varies by company and state of domicile. The 80 CSO table has been replaced by the 2001 CSO table for business issued in 2004 and later, although certain states may permit a transition period such as 5 years to adopt the new table. It appears that the ultimate portion of the 2001 CSO, which is a select and ultimate table, may be used alone, without the select portion.

For guaranteed renewable contracts where the valuation morbidity standard reflects the effect of insurer underwriting, and for return of premium or other deferred cash benefits, the policy termination rates can be based on pricing assumption and may exceed the specified mortality tables, but not in excess of the lesser of 8 percent per year or 80 percent of the policy termination rates used for pricing.

Methodology – With one exception, the statutory reserve methodology defined by the statutory minimum reserve

is the 2-year full preliminary term (FPT) reserves. The exception is return of premium or other deferred cash benefits where benefits are provided any time before the 20th anniversary. In this case, the 1-year full preliminary term method is the statutory minimum requirement.

Statutory minimum active life reserves are equal to mid-terminal contract reserves, plus a valuation net unearned premium reserve. The mid-terminal reserves are the average of the terminal reserves calculated at consecutive policy anniversaries before and after the valuation date. Some companies use interpolated terminal reserves based on the actual policy anniversary date. Some companies use mean reserves, minus net deferred premiums as an estimate of the mid-terminal reserve, plus net unearned premium reserve. If mean reserves are used, the *HIR Model Regulation* provides that they should be split between unearned premium reserves and contract reserves for Exhibit 6, and a deferred premium asset should be developed.

The *HIR Model Regulation* also provides that, “. . . in no event may the sum of the unearned premium and contract reserves for all contracts of the insurer subject to contract reserve requirements be less than the gross modal unearned premium reserve on all such contracts, as of the date of the valuation.” This requirement may be more pertinent to non-level premium products where contract reserves are small or zero and to companies with relatively new IDI operations.

Q. Can a company use its own actual morbidity experience when setting assumptions for active life reserves?

A. For purposes of calculating statutory minimum active life reserves, the *HIR Model Regulation* defines the minimum standard morbidity tables, minimum policy termination rates and mortality and interest rates. Reserves in excess of statutory minimum reserves can be held. Such reserves would normally be based on gross premium valuations or other methods that reflect company experience.

Q. Can reserves be calculated on a modeled basis?

A. Yes. Active life reserves are generally calculated on a seriatim basis. However, maintaining tables of active life reserve factors may be cumbersome. In this case, the actuary may choose to make use of some form of modeling or grouping, particularly with respect to less popular policies and benefits.

Q. Do companies hold negative active life reserves for any IDI benefits?

A. The *HIR Model Regulation* states, “Negative reserves on any benefit may be offset against positive reserves for other benefits in the same contract, but the total active life reserve with respect to all benefits combined may not be less than zero.” This is normally interpreted to allow negative reserves to be held for any benefit that is included in an IDI policy. The contract is usually considered to be a whole policy, including any benefits attached to the policy by a rider. Actuaries may find it prudent to use caution when holding negative reserves on a benefit that is detachable from the policy and may be canceled by the policyholder without impacting other elements of the policy.

Q. Is it redundant to hold active life reserves on policies with open claims?

A. No, active life reserves typically are calculated on all policies, whether on claim or not. In the development of claim costs for active life reserves, exposure is usually based on all in-force policies without regard to claim status. Policies on claim normally continue in force, often due to the waiver-of-premium provision.

Q. How are non-level premiums reflected in the active life reserves calculations?

A. The valuation net premiums (after any preliminary term period) are normally proportional to the gross premiums.

Q. How are active life reserves calculated for cost-of-living riders?

A. Cost-of-living (COL) riders on level premium policies have active life reserves. However, there is no minimum standard to define the inflation assumption for those COL riders based on the Consumer Price Index. Some actuaries have used an inflation assumption, equal to the discount rate, less an estimate of a real interest rate. This approach is usually reasonable, but may result in undervaluation of COL riders if the discount rate is low. Other actuaries use their best long-term estimate of future inflation.

Once the inflation assumption has been chosen, if appropriate, many actuaries project the annual increases in benefits due to the COL rider, given the underlying continuance table, in the calculation of contract reserves. These calculations recognize specific COL rider features such as lifetime caps, minimum and/or maximum annual increases, and simple or compound indexing. Because the COL riders flatten the slope of claim costs by attained age, contract reserves on policies with COL riders will generally be lower than contract reserves on comparable policies without COL riders. The unearned premium reserve will, however, usually be higher on policies with the COL rider.

Q. How are active life reserves calculated for residual benefits?

A. There are no minimum standards for residual active life reserves. Complicating the issue is the variety of possible residual provisions. Generally, the actuary applies overall adjustment factors to the base active life reserves that recognize the additional costs of residual benefits over the cost of the base benefits. The actuary may choose to base these adjustments on the ratios of the residual benefit premiums to the base contract premiums, if the actuary determines that the premiums generally follow the pattern of benefit costs. Alternatively, the actuary may choose to base these adjustments on the ratios of residual benefit claim costs to total disability benefit claim costs established at the time of pricing.

Q. How are active life reserves calculated for the waiver-of-premium provision?

A. Active life reserves for waiver-of-premium are normally calculated using the same valuation methodology and assumptions as the base contract, but reflecting the terms of the waiver agreement and the monthly premium. The actuary may choose to bear in mind that waiver payments are often made for the length of the premium paying period, which may not coincide with the base contract benefit payment period.

Some companies apply overall adjustment factors to the base active life reserve. The actuary usually determines these factors by modeling a comparison between the base claim costs and the waiver-of-premium claim costs. This would usually recognize actual premium levels, the waiver elimination period, and any significant retroactive provision.

Q. How are active life reserves calculated for social insurance supplemental riders?

A. Claim costs usually reflect the probability that Social Security disability or other social insurance benefits will be paid, the timing of the payments, and the amount of benefit payments. There is no statutory minimum standard

for this assumption. The actuary normally uses company experience to the extent practicable. The assumption may vary by duration of disability, age at disability, and sex.

Q. Are active life reserves required for the interaction of benefits on disability policies? If so, how are they calculated?

Yes, these reserves are required. There are at least two methods that actuaries use for calculating them. The interaction of the benefits can be modeled directly on a seriatim basis. A second method is to apply adjustment factors to the reserves or to the morbidity assumption for one benefit or the other to produce aggregate reserves. Other methods may also be in common use.

The following illustrates the interaction of benefits as well as the seriatim calculation of active life reserves. If a policy has both a cost of living benefit and a residual benefit, the COL will increase the monthly indemnity used to calculate the residual benefit. To calculate the reserves, the residual morbidity usually would be applied to the COL benefit projection. If the total disability morbidity assumption has been modified for the presence of the COL benefit, the actuary usually would consider a similar modification for the residual disability morbidity. The reserve for the interaction of benefits could be added to the reserve for any benefit to which it applies, or it could be carried as a separate value in the seriatim valuation.

When making an aggregate adjustment for the interaction of benefits, the actuary typically considers the impact of a correlation between election rates of the benefits, either positive or negative, when setting the adjustment factors. An assumption of independence between the election rates is rarely appropriate.

Q. How are active life reserves calculated for return-of-premium (ROP) riders?

A. The method of calculating active life reserves for ROP riders varies by the type of return-of-premium rider. One common form of ROP rider returns some portion of the paid premiums, less the incurred benefits after regular periods, such as every seven years. Neither the rider nor the policy needs to be surrendered to receive the ROP benefit. For these riders, one theoretically appropriate approach would be to calculate reserves based on projections of the expected ROP benefits at the end of each payout period for the length of time the rider is in effect. The corresponding net premium would usually then be calculated. The paid benefit offset would normally be carefully estimated using company experience. If credible company experience is not available, then the actuary may use stochastic modeling to estimate the offset. In any case, the valuation actuary typically would not assume that 50 percent or more of the paid premiums will be offset, since this assumption would likely understate the ROP payout significantly. For this type of ROP rider, rather than using the above approach, many actuaries calculate reserves that endow at the end of each expected payout period.

The other type of ROP rider returns 100 percent of the paid premiums, less paid benefits, after some long period such as 20 years or at age 65. The rider terminates once the benefit is paid. These riders are sometimes referred to as cash surrender value (CSV) riders. The rider may be surrendered before the end of the period and, if so, the surrender benefit is normally the paid premiums, less benefits, multiplied by a factor from a scale starting low and grading to 100 percent by the end of the CSV period. In these cases, the active life reserve may be calculated as an endowment that pays the total premiums, less an appropriate benefit offset, at the end of the CSV period.

As discussed earlier, the *HIR Model Regulation* permits the use of pricing policy termination rates, with some limitation, in the valuation of active life reserves for ROP and CSV riders. The valuation actuary may choose to consider the possibility that policy termination rates will spike following each payout period for the ROP-type

riders. For CSV riders, if pricing policy termination rates are used, the active life reserve typically would account for the cost of CSV benefits from surrendering riders before the end of the CSV period.

Q. How are active life reserves calculated for Future Income Option (FIO) availability?

A. In theory, active life reserves may be necessary to cover anticipated excess morbidity resulting from antiselection at the option dates. This can result in at least two different active life reserves. The first is the active life reserve for exercising future options. The morbidity cost of this benefit at each option date usually would be the present value of the anticipated excess morbidity, times the expected election rate, times the amount elected.

Alternatively, the second part of the active life reserve would usually be the present value of excess morbidity on previously elected options.

In reality, because few companies are able to properly monitor FIO experience, and because there are no statutory minimum standards, actuaries' practices vary from not establishing any reserve, to establishing a gross unearned premium reserve, or to applying an adjustment factor to the base contract reserve.

Once options are elected, the actuary usually calculates reserves on the new coverages. The statutory minimum standard applied to the new coverages typically follows the standard for the current issue year. However, some actuaries believe that these new coverages should follow the same standard as the original policy.

Q. How are active life reserves calculated for automatic benefit increases?

A. As with Future Income Options, in theory, active life reserves may be necessary to cover anticipated excess morbidity resulting from antiselection at the option dates. However, due to the high election rates and low amounts, both of which tend to minimize antiselection, actuaries generally do not calculate additional active life reserves in anticipation of potential antiselection.

Once options are elected, the actuary usually calculates reserves on the new coverages. The statutory minimum standard applied to the new coverages typically follows the standard for the current issue year. However, some actuaries believe that these new coverages should follow the same standard as the original policy.

Q. Are active life reserves held for benefits for which no standard morbidity table is specified? If so, what would the morbidity assumption be?

A. Yes, active life reserves should be held whenever the present value of future benefits exceeds the present value of future net valuation premiums. Per the *HIR Model Regulation*, the valuation morbidity basis should be established by a qualified actuary and be acceptable to the commissioner. The *HIR Model Regulation* provides that the tables should contain a pattern of incurred claims that reflects the underlying morbidity and should not be constructed for the primary purpose of minimizing reserves. The table should reflect company experience, where available, and reflect appropriate reserve margins to withstand moderately adverse conditions.

Q. Do unisex policies use unisex statutory reserve morbidity and policy termination assumptions?

A. No, active life reserves would normally be calculated using assumptions according to the sex of the insured.

Q. Are different active life reserves held for smokers versus non-smokers?

A. Because the assumptions for the standard morbidity tables generally do not differentiate by smoker status, contract reserves are usually calculated on a blended basis.

Q. What are the reserve practices with respect to substandard business?

A. In substandard cases where there is a premium rating, it is usually appropriate to increase morbidity to reflect the rating. In substandard cases where there is an exclusion or limitation rider, no additional reserve action is usually needed.

Q. How is reinsurance ceded handled?

A. For coinsurance, active life reserves are normally based on the same methodology and assumptions as the direct business and reflect the amount ceded. For yearly renewable term, companies generally do not take a credit for contract reserves. For extended wait with level premiums, ceded reserves usually reflect the direct methodology and assumptions as well as the terms of the reinsurance agreement. For aggregate stop-loss, there is generally only a credit for unearned premium.

Claim and Claim Expense Reserves

Q. Are the methods used to calculate claim reserves for guaranteed renewable policies different from those for noncancelable policies?

A. No, the methods and assumptions for claim reserves generally do not vary between guaranteed renewable and noncancelable policies.

Q. What are the statutory minimum bases for claim reserves to be held on approved claims?

A. **Morbidity** – The morbidity bases described in the *HIR Model Regulation* (64 CDT, 85 CIDA, 85 CIDB, and 85 CIDC) are used to calculate claim reserves.

The unadjusted 64 CDT is generally considered obsolete and inadequate for new claims, although with a low interest rate assumption (e.g., 3 percent), it may still be appropriate for older claims.

Until recently, the 85 CIDA table was the minimum standard for new incurred claims, but many companies adjusted the table, based on their own experience, because they felt the 85 CIDA table was inadequate. Since this table is generally more conservative than the 64 CDT table for claim reserves, actuaries have tended to use the 85 CIDA table before states officially adopted the revised *HIR Model Regulation*, subject to appropriate adequacy tests. The 85 CIDB table is another option for valuing claim reserves, but it is rarely used.

Recently, the NAIC added multiplicative adjustment factors to the 85 CIDA termination rates to the minimum standard for claim reserves only. The resulting table is called the 1985 Commissioners Individual Disability table C (85 CIDC). This table is stronger than the 85 CIDA during the first 18 months and more reflective of recent industry experience. The 85 CIDC adjustments continue through 60 months of disability.

For claims in their first two years, morbidity assumptions can be based on the insurer's experience, if such experience is considered credible by the actuary. This is discussed in more detail later.

Interest – Maximum interest rates, which vary by year of incurral, are defined in the *HIR Model Regulation* and are equal to the whole life statutory maximum interest rates.

Mortality – No separate decrement is required. The mortality decrement is usually included in claim termination rates.

Q. Is experience reflected in calculating claim reserves?

A. The *HIR Model Regulation* defines the minimum reserve standard based on specified morbidity tables and interest rates. However, with respect to morbidity, the *HIR Model Regulation* states that:

“For individual disability income claims incurred on or after [January 1, 2005], assumptions regarding claim termination rates for the period less than two (2) years from the date of disablement may be based on the insurer’s experience, if such experience is considered credible, or upon other assumptions designed to place a sound value on the liabilities.”

Specifically, for claims incurred on and after 1/1/2005, actuaries can use companies’ own experience for claim termination rates only in the first two years of the claim (using the minimum standard for morbidity thereafter). For claims incurred before 1/1/2005, actuaries may choose to project companies’ experience in all future claim years for claims in their first two years of disablement, and use the minimum standard morbidity for claims more than two years old. However, this approach may produce discontinuities in the claim reserves at the end of the two-year period.

Q. Do actuaries modify claim termination rates for specified diagnoses?

A. The termination rates in the morbidity tables used for minimum reserves are average termination rates for all diagnoses combined. During the first two years of disability, the *HIR Model Regulation* permits actuaries to set reserves based on diagnosis according to companies’ own credible experience. However, actuaries normally do not set manual or tabular reserves for specific claims based on diagnosis without setting the termination rates for claims without those diagnoses to an appropriate level.

Q. Do actuaries reflect contractually limited benefits for a specified diagnosis in the claim reserve?

A. Yes, but the valuation actuary may choose to consider the following when doing so:

- Claim termination rates are normally determined separately for claims with and without the limitation, as discussed in the previous answer.
- The possibility for the diagnosis for the claim to change to one without the contractual limitation and, as a result, continue after the end of the limited maximum benefit period.

Q. How are reserves established for ICOS claims?

A. Generally, reserves are calculated using the same methodology as that used for approved claims, and are multiplied by a factor that reflects the probability the claim will be approved. There are no statutory minimum requirements for this factor but it usually reflects company experience and practices. Some actuaries include all or some of the ICOS in the IBNR calculation, which is discussed later.

Q. How are reserves established for resisted claims?

A. Practices vary widely among actuaries. Full tabular reserves for resisted claims may be held, or the reserves may be adjusted by a factor based on the expected fraction of the value of the claim to be paid. More than 100 percent of the tabular reserves may be held if extra contractual costs are expected to be incurred. Some actuaries have chosen not to hold a specific reserve on each resisted claim, but to hold an aggregate reserve that can be demonstrated over time to be adequate for all resisted claims .

Resisted claim reserves may also be treated as part of the IBNR reserve. Actuaries usually exercise caution with this approach because the cost of these claims may be very slow to develop and the level of these reserves is often sensitive to claims administrative practices.

Q. Do actuaries recognize the release of reserves on Closed But Not Reported (CBNR) claims in the claim reserves?

A. A number of actuaries offset their companies' claim reserves in recognition of CBNR claims (i.e., claims that have terminated of which the company is not yet aware). Such offsets can be sensitive to claims administrative practices and, thus, normally reflect the company's own experience.

Some actuaries include the CBNR offset in their IBNR claim reserve. Others calculate it separately or simply do not calculate a CBNR offset, feeling that it is part of the overall reserve margin.

Q. The 85 CIDA and 85 CIDD tables do not define termination rates before the end of the elimination period. How are claims in their CIDA/CIDD elimination periods addressed?

A. There are a variety of practices. Some actuaries discount back with interest from the end of the elimination period to the valuation date but do not assume any claim termination rates during the elimination period. Some actuaries factor this into their ICOS factor. Still other actuaries attach termination rates from shorter elimination period tables to longer elimination period tables.

Q. How are reserves calculated for IBNR claims?

A. A company's historical IBNR reserve levels normally are retrospectively monitored using actuarial claim run-out analysis. This involves studying the actual paid claims and emerging claim reserves for claims qualifying as IBNR claims at each valuation date. Some actuaries reflect statutory reserve minimum standards in their run out of IBNR claims beyond the first 24 months of disablement.

The IBNR claims may include only "true" IBNR claims but many actuaries include pending claims, reopened claims, or resisted claims in their definition of IBNR claims. If other types of claims are included in an actuary's definition of IBNR claims, then the actuary usually does not establish separate IBNR reserves. For example, if pending claims are included in the IBNR, then the actuary does not normally calculate tabular claim reserves on pending claims.

The actuary normally monitors the liability tail of the claim run-out associated with IBNR claims closely. The tail can possibly extend to two years or longer. For valuation dates where the IBNR tail is not fully emerged, the actuary usually estimates the tail and add it to the emerged claim run-out.

Once the historical IBNR reserve levels are determined, then the actuary usually relates them to some base such as in-force premiums or tabular claim reserves on claims in their first year of disablement. This allows the actuary to estimate the IBNR reserves at interim valuation dates, prior to the next IBNR claim run-out analysis. The valuation actuary may choose to consider the expected impact of seasonality on the level of IBNR claims throughout a calendar year.

One dynamic approach for estimating the “true” IBNR reserve level is based on an expected incurred claim ratio, which is applied to earned premium over the 12 months before the valuation date to estimate the incurred claim costs for that period. The incurred claim ratio typically would be based on company experience, likely with a margin for adverse deviation. As actual claims incurred in that period emerge, their paid claims and claim reserves are usually subtracted from the expected incurred claims to derive the expected IBNR level for that incurrence year. Normally, the valuation actuary continuously monitors experience to ensure that the incurred claim cost ratios are adequate. The actuary also continues to monitor the emerging IBNR over previous incurrence periods. The IBNR reserve usually includes the remaining liability tail for all prior incurrence periods. While it is often preferable for the IBNR estimate to be split between the accrued and the unaccrued portions of the estimate, in practice carriers often do not make such a split and instead report the entire estimate as a claim liability in Exhibit 8 or as a claim reserve in Exhibit 6.

Q. How are reserves calculated for future re-opens?

A. The valuation actuary usually monitors the development of the cost of future re-open claims at each valuation date. The development period is somewhat controlled by the contractual language around successive periods of disability. Claims that terminate and then re-open may be restricted to a specified number of months (e.g., 6 months) between termination and re-opening if they are to be treated as one claim. However, the valuation actuary may find it prudent to bear in mind that claim practices may permit re-open claims over a longer period.

Once the historical level of re-open claims has been developed, they may be related to some base, such as total tabular claim reserves, in order to estimate re-open claim reserves at interim valuation dates. A number of actuaries compare the cost of re-open claims to the tabular reserves on claims terminating during the 12 months before the valuation date (as if they were still open for the purpose of this calculation). Terminated claims in this comparison would normally exclude those terminating due to death, benefit expiration, claim settlements, etc. In other words, only closed claims that have a chance of re-opening would usually be included. From this comparison, the actuaries generally develop factors that apply to the calculated tabular claim reserves on the terminated claims, from which they derive the re-open claim reserve. More recent terminations typically would have higher factors than those terminating further from the valuation date.

Q. How are advance pay claims handled?

A. Advance pay claims are those that may be near recovery and are paid several months of benefits in advance to encourage recovery. The valuation actuary may wish to keep in mind that this practice may invite a greater incidence of reopened claims. This additional cost may well remain within the overall claim reserve margins, or the actuary may choose to add more explicit margins. Some actuaries maintain the tabular claim reserve on advance pay claims until the end of the advance pay period, although the claims are technically closed.

If paying claims in advance is a significant claims practice (with respect to the frequency of its utilization or the length of the pay-out periods), reserve adequacy can be adversely affected. If reserves are not held during the pay-out period, the remaining claims may have lower termination rates on average than standard for a period of time. The

actuary may choose to adjust the valuation termination rate assumptions to take this into account. If the reserves are held on advance pay claims during the run-out period as if they are open, no other reserve action may be necessary.

The actuary normally considers the materiality of this claims practice in determining the method for addressing reserves for these claims. The level of claim reserves usually changes very little, if any, because of this claim administrative practice.

Q. How do data quality issues arise in the preparation of the claims valuation extract and how are they addressed?

A. There are two common primary sources of reserving problems from data in the claim administrative systems—manual errors and undiscovered or uncorrected systems errors.

Because of the relatively small volume of disability claims, many functions may be processed manually in the claim administrative system with the attendant potential for error. This is particularly true for fields in the claims system that are used solely for claim valuation and not for claim administration.

Also, because of the lower volume, systemic errors in the claims administration system may be slower to reveal themselves, and for the same reason, there may not be the urgency to correct the problem, particularly if a manual work-around is available.

The actuary usually is prudent to gain an understanding of claims processing with particular attention to potential points of error that could impact the claims valuation extract.

If the actuary has concerns about the quality of data in the claims valuation extract, the actuary may wish to consider recommending that the company periodically audit its claims information and practices as an important part of maintaining the quality of the claims valuation extract.

Q. How are claim reserves calculated for cost-of-living riders?

A. Cost-of-living (COL) riders usually require claim reserves for both past and future increases in benefits. However, there is no minimum standard to define the inflation assumption for those COL riders based on the Consumer Price Index. Some actuaries use their best estimate of future long-term inflation. Some actuaries have used an inflation assumption equal to the discount rate, less an estimate of a real interest rate (e.g., 3 percent). This approach is usually reasonable, but may result in under-valuation if the discount rate is low. In addition, it may overstate the COL reserves if there are caps on the level of COL benefits relative to the base benefit. Once the inflation assumption has been chosen, many actuaries, if appropriate, project the annual increases in benefits due to the COL rider, given the underlying continuance table, in the calculation of claim reserves. These calculations usually recognize specific COL rider features such as lifetime caps, minimum and/or maximum annual increases, and simple or compound indexing.

Q. How are claim reserves calculated for the waiver-of-premium provision?

A. Additional claim reserves for the waiver-of-premium benefit are normally calculated separately. Claim reserves for the waiver of premium benefit are normally calculated using the same valuation methodology and assumptions as the base contract, but reflecting the terms of the waiver agreement and the monthly premium. Waiver payments are often made for the length of the premium paying period, which may not coincide with the base contract benefit

payment period. Some actuaries apply a level factor to the base claim reserves to estimate the overall waiver claim reserve without taking the exact waived premium for each claim into account.

Q. How do actuaries reflect different definitions of disability in their claim reserves?

A. The morbidity basis for minimum reserves does not usually vary by the definition of disability. If a company's termination experience by definition of disability is credible, the actuary may reflect this experience in the claim reserves during the first two years of disability. Thereafter, the actuary uses the statutory termination assumption unless the company's experience would produce larger claim reserves.

Some definitions of disability are based on the claimant's inability to perform the duties of his or her regular occupation for a limited period, (e.g., two years), and then the standard changes to any "reasonable" occupation. For a few months before and after this change in the requirements for disability, termination rates may be elevated. It is generally appropriate to reflect the elevation of the termination rates if it occurs during the first 24 months of disability.

Q. How are claim reserves calculated for residual benefits?

A. Theoretically, a different continuance table and approach from that used for base claims could be appropriate. However, it is usually difficult to accumulate sufficient data to create a new table and methodology. Furthermore, statutory minimum reserve bases do not usually recognize claim cost differences between policies with and without residual benefits. Pro-rata tabular reserves for claims receiving residual benefits are often used. One common approach is to multiply the basic claim reserve by the ratio of the current benefit to the maximum (or basic) benefit. Some actuaries use a fixed ratio (e.g., between 60% and 80%), regardless of the current residual benefit. Although these approaches may not be theoretically precise, the actual imprecision may be small and covered by the overall margin in the reserves.

If the maximum benefit period for residual disability is not co-terminus with the maximum benefit period for total disability, many actuaries use the maximum benefit period for residual disability to calculate reserves for residual disability claims. This approach typically does not address the possibility that some claims will switch back to total disability before the end of the maximum benefit period for residual disability benefits. As a result, some actuaries choose to project residual benefits for the total disability benefit period.

Q. How are claim reserves calculated for social insurance supplement riders?

A. If a claimant is currently receiving social insurance benefits, the reserve generally reflects the reduced disability benefit payable. For those who are early in their claim, claim reserves may reflect the probability that Social Security benefits will be paid, as well as the timing and amount of the Social Security benefit, if applicable. In practice, this may be immaterial because of the relatively small number of claims with this benefit and their relatively small monthly indemnities.

There is no statutory minimum standard for this assumption. Actuaries normally use company experience to the extent practical. The assumption may vary by duration of disability, age at disability and sex.

Q. How are claim administration expenses reflected in claim expense reserves?

A. The *HIR Model Regulation* requires claim expense reserves in addition to claim reserves. The valuation actu-

ary should refer to SSAP No. 55 and No. 85 regarding the types of expenses to be included. One common approach is to relate claim administration expenses to paid benefit levels and, thus, develop claim expense reserves as a percentage of claim reserves. The actuary typically decides whether to apply an inflation assumption to the claim administration expense. The claim administration expense on IBNR or ICOS claims usually reflects the cost of both the initial investigation and ongoing maintenance. The administration expense on approved claims normally reflects the cost of ongoing maintenance, but not the cost of initial investigations.

There are no specific statutory minimum requirements for the claim expense reserves. The *HIR Model Regulation* provides that claim expense reserves may not be added to claim reserves to satisfy minimum claim reserve requirements. While it is not common, an actuary could choose to reflect a company's experience for these reserves at all claim durations.

Company practices vary regarding placement of these reserves. Some include all or a portion of them as part of Exhibit 6 with other claim reserves. Some include all or a portion as part of Exhibit 8 with claim liabilities. Still others include them in Exhibit 2, General Insurance Expenses. Regardless, the actuary generally includes these reserves in the asset adequacy analysis and the Actuarial Opinion Memorandum.

Q. How should reinsurance ceded be handled?

A. Claim reserves are usually based on the same methodology and assumptions as the direct business, and reflecting the amount ceded and other terms of the reinsurance treaty (e.g., the different elimination period for extended wait).

Reserve Adequacy Analysis

Q. What requirements must statutory reserves meet?

A. Statutory reserves must comply with statutory minimum reserve standards and satisfy reserve adequacy testing.

Q. How is reserve adequacy evaluated?

A. The *HIR Model Regulation* requires an annual gross premium valuation. At intervening times, it is permissible to estimate the values from the previous valuation and changes in the in-force business. Premium deficiency reserves are normally set up if the reserves fail the reserve adequacy test.

Q. What references exist for gross premium valuations and reserve adequacy tests?

A. There is one primary reference for these processes—the *NAIC Health Reserves Guidance Manual*, Section VI.

The *HIR Model Regulation*, Section 1 and SSAP 54 paragraphs 18, 23, and 34 reference reserve adequacy tests.

Q. Are active life and claim reserves combined to demonstrate adequacy?

A. In Section 1B, the *HIR Model Regulation* states:

“Adequacy of an insurer’s health insurance reserves is to be determined on the basis of all three categories [claim reserves, premium reserves, and contract reserves] combined. However, these standards emphasize the importance of determining the appropriate reserves for each of the three categories separately.”

Section 4D of the *HIR Model Regulation*, applicable to contract reserves, states:

“Annually, an appropriate review shall be made of the insurer’s prospective liabilities on contracts valued by tabular reserves, to determine the continuing adequacy and reasonableness of the tabular reserves giving consideration to future gross premiums.”

Contract reserves should be tested for adequacy separately from claim reserves.

Q. When are premium deficiency reserves necessary and, if required, what amount should they be?

A. A premium deficiency reserve is required for a segment of business when the reserves based on current valuation bases are less than reserves based on a gross premium valuation using the valuation actuary’s best estimate assumptions. The premium deficiency reserve is in addition to claim reserves and contract reserves as well as rate stabilization reserves, etc.

The NAIC *Health Reserves Guidance Manual* defines the premium deficiency reserve by the following formula:

a) The sum of the present value of future paid claims and the present value of future expenses through the end of the deficiency period, and the present value of contract, claim, and claim expense reserves at the end of the deficiency period;

less

b) The sum of the present value of future earned premiums through the end of the premium deficiency period and current contract, claim, and claim expense reserves and liabilities.

For non-cancelable policies, the deficiency reserve period is the same as the contract period, which is the period over which contract reserves are calculated.

For guaranteed renewable policies, where current and future premiums are expected to produce a deficiency over the contract period, the premium deficiency period is the same as the contract period. If the actuary anticipates that future premium increases to eliminate premium deficiencies after a period of time, many actuaries believe that the *NAIC Health Reserves Guidance Manual* suggests that the premium deficiency period extends only until future rate increases bring premiums to an adequate level.

Both SSAP 54 and the *HIR Model Regulation* state that gross premium valuations should be performed using “expected” assumptions, which many actuaries believe means that “best estimate” assumptions with no margins for adverse deviation. Premium deficiency reserves would normally be at least enough to cover the deficiency. In light of other guidance with regard to conservatism, the actuary normally determines if additional margin is warranted.

Q. How is business usually grouped when determining premium deficiency reserves?

A. SSAP 54 states that “for purposes of determining if a premium deficiency exists, contracts shall be grouped in a manner consistent with how policies are marketed, serviced, and measured.” The *NAIC Health Reserves Guidance Manual* further expands the criteria for grouping contracts by including examples such as product type, case size, marketing methods, geographic rating areas, and length of guarantee periods. It also states that the business groupings “should be large enough to be material relative to the size of the reporting entity as a whole. In some cases, considerations of similarity and materiality may result in the entire health business being treated as a single grouping.”

Excess reserves in one contract group are not used to cover deficiencies in another.

Q. Which financial elements are projected?

A. Typically, net liability cash flows involve projection of gross premiums, paid benefits on existing claims (including waiver), paid benefits on future new claims (including waiver), on existing policies, commissions, maintenance expenses, claim expenses, state taxes, licenses, and fees. In addition, contract, claim, and claim expense reserves at the end of the projection period are usually projected. The projections are usually done net of reinsurance ceded, and net of expense reimbursement allowances. If the actuary wants to study the pattern of emerging profits, then annual net investment income and the various reserves would also be projected throughout the projection period.

Income taxes are specifically excluded; the deficiency reserve is calculated pre-tax as discussed in the *NAIC Health Reserves Guidance Manual*.

Q. What methodology is used to do a gross premium valuation?

A. Some actuaries do projections seriatim. However, as with other types of actuarial work, using as many or as few cells that the actuary feels cover the significant risk parameters is usually appropriate. The actuary normally reviews year-by-year results to look for possible future deficiencies.

Q. What assumptions are needed to perform a gross premium valuation?

A. Impact of new business – The choice of expense, persistency, and morbidity assumptions may be made on a going-concern basis, but normally new business is not specifically part of the cash flow projection model—with one exception. New business resulting from coverage additions to currently in-force policies arising from contractual obligations such as future insurability options and automatic benefit increases is usually included in the gross premium valuation.

Rate increases – Use of reasonable rate increases is permitted, provided the rate increases are consistent with the morbidity and lapse assumptions. For example, a rate increase typically would be supported by appropriate anticipated morbidity and lapse experience. Also, lapse rates would usually be adjusted for potential shock lapses in the wake of the rate increase, and the resulting morbidity following the shock lapse typically would recognize the potential deterioration of experience, since the additional terminations likely involve healthier lives.

Morbidity – The major risk parameter for IDI is usually morbidity. The morbidity assumption may be based on studies of incidence and termination separately, or studies of claim costs, taking into account the risk characteristics of the business involved. Development of best estimate assumptions takes into account data credibility, risk management practices, and secular and socioeconomic trends. Any major changes anticipated in policy or claim administration would normally be reflected. Some averaging of recent data, usually before projecting trends, may be appropriate to account for historical volatility.

In general, the standard features covered in this practice note typically will be reflected in historical experience and in the actuary's judgment when doing projections. Cash flows for optional benefits may be projected separately from those of the basic policy. Techniques for COL and residual disability described elsewhere in this practice note usually apply.

Net investment income yields – Actuaries normally use future expected portfolio rates, adjusted for asset default rates and investment expenses. One way to accomplish this is to use the projected portfolio rates from the baseline interest rate scenario of the company's asset adequacy analysis, discussed below.

Expenses – In this practice note, expenses is used generically and includes commissions and taxes, licenses and fees, as well as general insurance expenses as appropriate, unless otherwise indicated.

Actuaries usually consider the following:

1. Acquisition vs. maintenance costs – Acquisition costs are normally excluded except for costs related to the acquisition of contractual coverage additions.
2. Claim expenses – These are split between initial claim investigation and ongoing maintenance. For existing claims, only ongoing maintenance costs usually are projected.
3. Inflation vs. anticipated unit expense reductions – Actuaries may include an assumption for inflation and may offset it against future unit expense reductions.
4. Overhead – All significant expenses of the reporting entity usually are allocated for the calculation of gross premium valuations and premium deficiency reserves, if needed. If other lines of business can cover overhead expenses, the calculation of the gross premium valuation and premium deficiency

reserve is usually performed using only direct costs.

Lapses – Are usually based on company experience. Actuaries typically take into account the potential relationship between lapsation and morbidity. For example:

1. When projecting future premium increases on guaranteed renewable policies, actuaries typically take into account possible shock lapses and morbidity deterioration.
2. Because lapsation is often an anti-selective event, the actuary may choose to consider whether claim incidence or termination rates will improve if lapse rates are lowered.

Q. How do actuaries include reserves calculated from a development method in the gross premium valuations?

A. IBNR reserves are an example of reserves calculated from a development method. As discussed earlier, IBNR claims may include pending, re-open and resisted claims, in addition to “true” IBNR claims. Some actuaries include these reserves in the gross premium valuation by projecting the future cash flow based on these claims’ typical or average historical claim run-out. This can usually be obtained from the development methodology. Other actuaries true up a projection of open claims that have durations similar to IBNR claims, so that the present value of the projected benefits is equal to the IBNR reserve, with or without the assumed margin for adverse deviation.

If valuation actuaries can demonstrate independently the adequacy of their IBNR reserves, they may decide not to include them in their gross premium valuation. Including the IBNR reserves in the gross premium valuation is usually prudent if the projected cash flows are going to be included in the asset adequacy analysis.

Q. Do actuaries perform sensitivity testing in their gross premium valuations?

A. Performing sensitivity testing on gross premium valuations is not required, but it may be prudent to do so in some circumstances. An example might be when reserves are not adequate or only have a small margin, particularly, if IDI reserves constitute a large portion of total company reserves.

Q. Should the Asset Valuation Reserve (AVR) and Interest Maintenance Reserve (IMR) be included in the gross premium valuation?

A. No. The AVR does not support insurance liabilities so it is not usually included. Whether the IMR is included in the gross premium valuation depends on the calculation of the projected investment yields. If projected yields include the amortization of the current IMR, then the IMR is not usually included in the gross premium valuation. If projected yields do not include the amortization of the current IMR, then it is normally reasonable to include the IMR in the gross premium valuation.

Q. What documentation is required of premium deficiency reserves?

A. If no premium deficiency reserves are required, test results would usually still be documented. If premium deficiency reserves are required, documentation is required for the groupings, assumptions, and time periods used. The *NAIC Health Reserves Guidance Manual* provides additional details.

Asset Adequacy Analysis

Q. Does the actuary perform asset adequacy analysis if reserves pass reserve adequacy tests?

A. Yes, reserve adequacy analysis and asset adequacy analysis are separate requirements. They are also different analyses performed under different circumstances.

Q. How does the methodology for asset adequacy analysis compare to that used for reserve adequacy analysis?

A. In spite of the numerous differences listed below, the process of modeling the liability cash flows for asset adequacy analysis can be very similar to reserve adequacy analysis. For asset adequacy analysis, the cash flows are usually projected year by year, so the reserve adequacy analysis option of using discounted present values at the valuation date is not normally available. Both projections of business exclude new sales, except for increases in coverage arising from contractual obligations.

The table below contrasts the important differences that usually exist between asset adequacy analysis and reserve adequacy analysis.

Important Differences between Asset Adequacy Analysis and Reserve Adequacy Analysis		
	Asset adequacy analysis	Reserve adequacy analysis
Assets and investment income	Projection of asset cash flows including investment of cash flows; defaults; and asset sales required to satisfy liquidity needs as well as net investment income.	Net investment income yield that may vary by year of projection.
Scenarios	Testing of various scenarios is required.	Only best estimate of future experience is required.
Beginning reserves	Reserve adequacy tested reserves.	Reserves calculated by the valuation standard formulae and assumptions.
Business grouping	Entire company is tested as a whole.	Accident and Health business are tested separately and further segmentation may be appropriate.
Income taxes (included?)	Yes	No

Q. How long is the projection period?

A. As stated in ASOP No. 22, asset adequacy is tested over a period that extends to a point at which future cash flows on the remaining business are immaterial in relation to the analysis. For IDI, actuaries typically use a projection period of at least 25 to 30 years. In some cases, the projection period may extend for as much as 50 or more years.

Q. How do assumptions for asset adequacy analysis compare to those used for reserve adequacy analysis?

A. Similarities – best estimates of morbidity, lapses, expenses; use of in-force policies and claims thereon only.

Differences –federal income tax, including DAC tax, may be included as an explicit ongoing expense. Since the timing of tax payments depends on reserves determined under IRS regulations, their impact usually merits consideration. If earnings are negligible, tax obligations are sometimes ignored in a zero-margin reserve calculation, but this does not recognize the timing of tax payments. If all future taxes on earnings are included in the cash flows in a gross premium valuation, discounting is usually based on a pre-tax yield rate.

Use of scenarios – NY 7 for interest rates, test adverse swings in other assumptions.

Q. What sensitivity/scenario tests are done? What interrelationships of parameters are recognized?

A. Life Practice Note 1995–9, *Alternative Methods of Testing for Obligation Risk*, outlines various scenarios and sensitivity tests. Some actuaries do sensitivity tests of the net liability cash flows first, and then consider alternative investment scenarios. However, the order is not usually significant.

Due to the availability of tools and time, many actuaries use deterministic models. However, a stochastic approach (e.g., Monte Carlo simulations) if appropriate, may give a better feel for variability of results, and, thus, the reasonableness of reserves and reserve margins. The actuary applies professional judgment to decide what techniques to use.

The actuary usually chooses the scenarios to be run on the company and the characteristics of its IDI business. For example, in a recession, interest rates might be expected to decrease, lapses and morbidity to increase. In general, if lapses increase it might be expected that morbidity increases due to anti-selection. Also, the expense inflation factor, if any, ordinarily bears a reasonable relationship to interest rates.

Q. When cash flow testing is completed, is the pattern of earnings an appropriate means to determine if a test is successful?

A. Projected losses, particularly in the early years of a cash flow projection, may warrant attention, but they do not necessarily indicate that a scenario has failed. Disability income business can be subject to volatile earnings patterns due to changes in claim incidence and claim continuance, which may be noted as observations in the actuary's communications.

Q. Do actuaries project the assets and liabilities together?

A. For the most part, IDI liabilities are not sensitive to the economic environment, so the assets and liabilities can be projected separately. There are some exceptions to this. First, cost of living benefits are based on the Consumer Price Index, since the expectation of future inflation is part of the interest rate. Second, the cash surrender value type refund of premium rider has a disintermediation risk. A third exception is elevated disability claims during periods of high unemployment.

Q. Are items reserved using development methods or factors included in the cash flow testing? If so, how?

A. It is usually appropriate to include as much of the total reserves in asset adequacy analysis as is reasonably practicable. Reserves calculated through development methods or factors can be included in asset adequacy analysis using the same methods employed in a gross premium valuation.

Q. Should the asset valuation reserves and interest maintenance reserve be included in cash flow testing?

A. The *AOMR* requires an allocation of the IMR to be included. The *AOMR* also describes methods for including the AVR. This issue is discussed in Life Practice Note 1995-5, *Use of the AVR/IMR in Cash Flow Testing*.

Q. How is asset adequacy analysis used to develop appropriate reserves?

A. Asset adequacy analysis may be used to test statutory reserves for margins and adequacy, or the analysis may be used to directly calculate the reserves. Both approaches are essentially similar, and the discussion in this practice note makes no distinction between them.

Q. When performing an asset adequacy analysis, which assets are tested?

A. Assets backing IDI reserves are usually tested. If assets are segmented for internal management purposes, this would be a good starting point in many cases. If assets are not segmented, some division of assets among lines of business would usually be made, taking into account the nature of the risks.

Typically, IDI risks have a relatively long duration of net cash flows. This is due to both the benefit periods being long, and to policies being renewable until the insured's age reaches 65 or older. Therefore, actuaries commonly use longer duration assets for better matching and for lower sensitivity to interest rate changes.

If testing current reserves, the actuary may use assets equal to those reserves as a starting point. If developing reserves, the actuary might use assets equal to unadjusted tabular reserves. In either case, once the final level of reserves has been set, actuaries are usually prudent to determine whether assets backing those reserves have been tested.

Q. Are there any special considerations in modeling IDI assets versus other lines of business?

A. No. Modeling uses the same assumptions for the same types of assets. Reinvestment philosophy, yields at reinvestment, asset default rates, investment expenses, and taxes are some of the significant assumptions that may apply.

Information on modeling bonds, mortgages, real estate, and collateralized mortgage obligations (CMOs) may be found in Life Practice Notes 1995-6, *Modeling Bond Default Risk*; 1995-7, *Modeling Mortgage and Real Estate C-1 Risk*; and 1995-8, *Collateralized Mortgage Obligations*.



AMERICAN ACADEMY *of* ACTUARIES

1100 Seventeenth Street NW
Seventh Floor
Washington, DC 20036
Telephone 202 223 8196
Facsimile 202 872 1948
www.actuary.org