

LIFE PRACTICE NOTE 1995-1
December 1995

General Considerations

Introduction

This practice note was prepared by a work group organized by the Committee on Life Insurance Financial Reporting of the American Academy of Actuaries. The work group was charged with developing a description of some of the current practices used by valuation actuaries in the United States. This work group was originally formed in 1992 and issued the first set of Life Practice Notes that year; changes have been made to this set of practice notes on an annual basis to reflect additional information on current practices.

The practice notes represent a description of practices believed by the work group to be commonly employed by actuaries in the United States in 1995. The purpose of the practice notes is to assist actuaries who are faced with the requirement of adequacy testing by supplying examples of some of the common approaches to this work. However, no representation of completeness is made; other approaches may also be in common use. It should be recognized that the information contained in the practice notes provides guidance, but is not a definitive statement as to what constitutes generally accepted practice in this area. Moreover, these practice notes are based upon the model Standard Valuation Law of the National Association of Insurance Commissioners (NAIC). To the extent that the laws of a particular state differ from the NAIC model, practices described in these practice notes may not be appropriate for actuarial practice in that state. 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 the original practice notes are as follows:

Donna R. Claire, chairperson

Arnold A. Dicke

Steven A. Smith

Douglas C. Doll

Stephen J. Strommen

Craig F. Likkell

Charles N. Vest

Linn K. Richardson

Michael L. Zurcher

Henry W. Siegel

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Additional review for the 1995 Life Practice Notes was provided by the following members of the American Academy of Actuaries' Committee on Life Insurance Financial Reporting:

Donna R. Claire	
Andrew R. Creighton	Frank W. Podrebarac
James E. Hohmann	Meredith A. Ratajczak
Michael J. O'Connor	Henry W. Siegel

Comments are welcome as to the appropriateness of the practice notes, desirability of annual updating, validity of substantive disagreements, etc. Comments should be sent to Donna R. Claire at her Directory address.

Note: This practice note covers some possible answers to a number of different questions that were asked by and posed to members of the work group and that have not otherwise been covered in other practice notes.

Q. What current practices are the practice notes based on?

A. Since 1986, some actuaries have been performing cash flow testing for certain annuity and other interest-sensitive lines of business under the requirements of New York Regulation 126. Many practices that have been developed were in response to this regulation. Reviews of these practices have been published from time to time (e.g., *Proceedings of the Valuation Actuary Symposium*, 1985–1994).

Also, in 1990, the Actuarial Standards Board published Actuarial Standard of Practice (ASOP) No. 14, *When to Do Cash Flow Testing for Life and Health Insurance Companies*, which required the actuary to do cash flow testing under certain circumstances. Since the release of ASOP No. 14, some regulators have required cash flow testing in order to show reserve adequacy. Practices developed because of this testing are also included as current practices. In 1993, ASOP No. 22, *Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers*, and Actuarial Compliance Guideline (ACG) No. 4, *Statutory Statements of Opinion Not Including an Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers*, pertaining to Section 7 opinions, were released.

A survey was taken in early 1993 on the practices followed by appointed actuaries for year-end 1992. This survey was jointly sponsored by the Society of Actuaries and the American Academy of Actuaries. There were 141 responses to this survey. Certain results from this survey have been incorporated into the 1995 Life Practice Notes.

A Postmortem 1992 Valuation Actuary Symposium was held in June 1993. Approximately 70

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actuaries attended. Additional surveys were taken at this seminar. Results of some of these surveys have also been used to update the Life Practice Notes.

Finally, comments from insurance regulators were also incorporated into the 1995 Practice Notes.

Q. Are these practice notes expected to become a *standard* that actuaries must follow?

A. Absolutely not. These practice notes document what is believed to be *current practice*. There are a number of reasons an actuary might choose to use methods other than those described in these practice notes. First, the appointed actuary is the one opining on the reserves, and he or she could be aware of special circumstances pertaining to a particular company or block of business. Also, an actuary may have developed better testing methods, and *current practice* may not have caught up with the improved method of testing.

Finally, the practice notes may not necessarily represent the total range of current practice in all areas. Each practice note was reviewed by actuaries familiar with the topic of the practice note, and these actuaries have concluded that the practice note represents approaches that fall within current practice. Moreover, comments were solicited from the actuarial community. It is quite possible, however, that other approaches that could properly be termed *current practices* were not documented herein.

Q. How do actuaries approach modeling?

A. One possible game plan for modeling a life insurance company is as follows:

1. Determine the purpose of the testing.
2. Review the prior year's modeling.
3. Develop assumptions.
4. Determine the sensitivity tests to be done.
5. Model.
6. Validate the model/results.
7. Determine what, if any, corrective actions are needed.
8. Write the report.

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Q. What is the goal of asset adequacy testing?

A. A number of actuaries feel that the primary purpose of the asset adequacy testing is to inform management of actual or possible problems that arise due to the current management of the business, e.g., due to the current crediting or investment strategies. At least one report, such as an executive summary, may be directed at management. Another goal of this testing may be, of course, to satisfy the regulatory requirements.

Q. How does one establish what should be tested?

A. According to ASOP No. 22, *Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers*, virtually all reserves are covered: “For reserves to be reported as *not analyzed*, the appointed actuary should judge them to be immaterial.” One standard of materiality used by some actuaries is less than 5% of total reserves. (This is the number mentioned in a letter to appointed actuaries dated November 3, 1994, from Larry Gorski, Life Actuary of the Illinois Department of Insurance.) Some other actuaries set a dollar limit to materiality.

Q. How does the *Dynamic Financial Condition Analysis Handbook* relate to asset adequacy testing?

A. The *Handbook*, published by the Society of Actuaries in April 1995, concentrates on analyzing the financial condition of a company, including surplus. However, there is much useful information in the book that may also be applicable to asset adequacy testing.

Q. How is an asset (reserve) adequacy analysis different from a solvency test?

A. An *asset adequacy analysis* is a determination as to whether projected asset cash flows, together with projected premiums or considerations, are reasonably likely to cover projected liability cash flows. The assets included in this type of analysis only include assets backing the liabilities and do not include assets backing the surplus of the company. Also, no projection of new business is made. The main objective of the asset adequacy test is to determine whether the liabilities and reserves are likely to be deficient and whether an additional reserve might need to be established.

A *solvency test* is more inclusive than an asset adequacy analysis. All of the assets and liabilities of the company are included in a solvency test. Also, a projection of new business is usually

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included. The main objective of the solvency test is to determine whether the surplus of the company is likely to be sufficient to support the current operations of the company.

The NAIC model *Actuarial Opinion and Memorandum Regulation* (hereafter the *Model Regulation*), in support of the Standard Valuation Law, requires an actuary to opine, in certain circumstances, that “the reserves and related items, when considered in light of the assets held by the company with respect to such reserves and related actuarial items . . . make adequate provision, according to presently accepted actuarial standards of practice, for the anticipated cash flows required by the contractual obligations and related expenses of the company.” Thus, the required opinion is an asset adequacy opinion on reserve adequacy, as opposed to a solvency opinion.

The actuary is not currently required by either the ASB's actuarial standards of practice or the model Standard Valuation Law (as of August 1, 1995) to test for solvency with regard to the actuarial opinion that is filed with the statutory annual statement. However, reserves are typically the largest liability of a life insurance company, so reserve adequacy testing is often an important tool in assessing the overall financial health of life insurance companies.

Q. How long should the projection period be?

A. ASOP No. 22 states that, “[a]sset adequacy should be tested over a period which extends to a point at which reserves on a closed block are immaterial in relation to the analysis.” Many actuaries use shorter projection periods for single-premium deferred annuities (SPDAs) than for structured settlements, immediate annuities, and life insurance policies. Projections may also be done for longer periods, such as 20 years, to test whether investment earnings eventually fall to where they do not support guaranteed minimum interest rates in “down and die” scenarios.

Q. What lines may be combined for purposes of cash flow testing?

A. Generally, the appointed actuary opines on the adequacy of reserves in the aggregate. Thus, in theory, life insurance may be combined with annuities. More commonly, actuaries test the products by major business units. These business units may not necessarily represent statement lines of business. The NAIC *Model Regulation* allows aggregation to be done before the reserves of the individual business units are judged deficient or redundant. That is, the results of individual scenarios may be aggregated. For example, long-duration annuities (e.g., immediate annuities) and short-duration annuities (e.g., SPDAs) may be aggregated on a scenario-by-scenario basis.

The NAIC *Model Regulation* also allows redundancies in one line to affect deficiencies in

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another, provided that either (1) the results have been developed using consistent economic scenarios, or (2) the lines involve mutually independent risks.

Some states, such as New York, may have different requirements. These state requirements may not allow aggregation across major lines of business.

Q. If lines of business are being aggregated, is the same projection period used for all lines of business?

A. Some actuaries use the same number of years to test all lines of business being aggregated. The typical test period appears to be 20 years. However, it is not a requirement that the same projection be used. Since some products (e.g., SPDAs) are generally of shorter duration than immediate annuities and structured settlements, it may be difficult to find a common projection period that produces meaningful results for each duration for all lines combined; therefore, some actuaries use different projection periods, depending on the line of business being tested.

Q. Can the lines themselves be combined, or only the results?

A. Both methods currently are being utilized. Combining the lines in effect means combining results on a scenario-by-scenario basis. Combining results means using redundancies in one line to offset a deficiency in another line.

When different projection periods are used, combining the cash flows of distinct lines may not make sense. Instead, some actuaries project each business unit separately and discount the excess of the ending market value of assets less the ending present value of liabilities back to the projection date, in order to get results that may be combined on a scenario-by-scenario basis.

Q. How may assets be allocated among the lines if cash flow testing is done separately for each line?

A. Regulations will normally require that any assets that are contractually allocated to a specific line for a special purpose (such as by reinsurance treaty or separate account) be allocated to that line for the cash flow testing. Beyond that, if the company has segmented the assets by line (officially or unofficially), then this allocation may represent a good place to start. However, to the extent that the actuarial opinion covers all lines of business, it may be appropriate to assign investments differently, providing that the same asset is not used twice and the resulting liability rates (e.g., annual crediting rates) are not distorted.

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Some companies maintain records of the years in which assets were purchased and the years in which the money was received under various contracts, so the actuary may make use of these allocations to assign assets to liabilities.

Many actuaries feel it is important to maintain reasonable consistency from year to year in the method of allocating the assets to product lines. If a change in allocation is made, it may be useful to document the impact of the change on the adequacy test.

Q. What are commonly used criteria for adequacy?

A. One criterion used by many actuaries is the estimated ending net market value, calculated by estimating the market value of assets at the interest rates in effect at the end of the scenario, and deducting the present value (at the same interest rates) of the remaining projected benefits and expenses. This gives an estimate of the market value of ending surplus. It should be noted, however, that some regulators have interpreted current regulatory requirements to require use of the book value of such liabilities, instead of the above-cited present values. Scenario tests with positive market values of ending surplus are commonly used.

There are some companies that project the book values (as opposed to market values) until the remaining liabilities are de minimis, with positive book value of surplus at the end of the test period considered acceptable. There are, however, several regulators who strongly prefer to see the ending value of surplus stated on a market value basis.

Q. How may the discount rate be determined?

A. There are currently several methods of determining a discount rate. The method suggested by members of the New York Insurance Department is to run a scenario, and then rerun the scenario adding \$1,000 of existing assets. The ratio of the ending differences can be used to determine the discount rate for that scenario.

There are other methods of determining a discount rate currently being used by actuaries. One is to use the after-tax portfolio rate (i.e., the average investment earnings rate) used in each scenario. Another method is to use the 1-year Treasury forward rates that are generated in each scenario. An alternative is to use the Treasury spot rate for the length of the projection period, e.g., 20 years, that is generated under each scenario.

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Q. Are extra reserves set up if any of the scenarios fails to meet the adequacy criteria?

A. Not necessarily, although it is a possibility. Approximately 10% of those responding to the 1992 Valuation Actuary Survey reported that they increased reserves as a result of cash flow testing. An informal survey of regulators done on 1994 results showed that there were a number of companies, especially those with interest-sensitive lines of business, that established extra reserves.

One method of establishing such rules was proposed in an article by Dr. David N. Becker, Michael S. Smith, and Michael L. Zurcher, entitled “Zen and the Art of Reserve and Asset Adequacy.” This article was first published in Lincoln National's *Reinsurance Reporter* (3d quarter, 1993). The article established eight criteria (the *eightfold way*) the authors developed in order for the asset adequacy decision to be made. These criteria covered whether there were positive retained earnings for the block at the end of a projection; whether there were scenarios that ultimately “passed” but that encountered serious stress during the period of testing; the effect of sensitivity testing results; and the effect of aggregating.

For sets of random scenarios, it would depend on what percentage of scenarios failed and by how much. As noted above, an actuarial test of reserve adequacy is not a solvency test. While a test of solvency would presumably require the passing of a very large percentage of scenarios (and a reasonable limit to the severity of failure), a reserve typically may be considered *adequate* as long as a reasonable percentage, including moderately adverse scenarios, is passed.

At this time, there is no specific rule as to what percentage of random scenarios must be passed to determine reserve adequacy. In judging the results of a multi-scenario test, it is prudent for the actuary to bear in mind that the surplus that is generated by any scenario is subject to a number of assumptions used in the testing (e.g., investment strategy, interest crediting strategy, and dynamic lapse formula). The liberalism or conservatism of these various assumptions can influence the interpretation of the results.

There are several insurance regulators who would like to have the failure of any of the Basic 7 scenarios (first specified in New York Regulation 126, so some actuaries refer to them as the *New York 7 scenarios*) disclosed in either the actuarial opinion or an executive summary to the actuarial memorandum. The proposed changes to the NAIC *Model Regulation* would require disclosure of the ending surplus on each scenario. At this time, there are no requirements from regulators as to the number of scenarios one has to “pass.” The revised New York Regulation 126 does require additional testing if the present value of ending surplus is negative in any of the Basic 7 scenarios.

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Q. Do actuaries usually verify that there are still sufficient assets at the end of the projection period only, or do they also check intermediate points in time?

A. The final wording of ASOP No. 22 removed all references to the checking of intermediate points. Such references had occurred in earlier drafts. Thus, according to ASOP No. 22, a reserve adequacy test does not require that intermediate points be checked.

Some actuaries believe the standard requires them to look at intermediate cash flows to assure that any negative cash flows could potentially be funded from company resources or by borrowing. However, the projection of statutory reserves (and, thus, surplus levels) at intermediate points does not appear to be required by the standard.

Poor performance at intermediate points in time may have an impact on the choice of assumptions beyond that point in time. For example, a string of years with substantial statutory losses may influence future excess lapse assumptions. Some actuaries use the results of intermediate years to see if the situation is so bad that a lapse-mortality spiral could occur, resulting in the need to increase reserves.

Other actuaries point out that surplus is normally available to cover statutory shortfalls in intermediate years. Such surplus is not reflected in reserve adequacy tests; therefore, some level of imbalance at intermediate points may be tolerated, particularly on a line-of-business basis.

Of the 132 actuaries who responded to the survey on 1992 practices, 84% looked at intermediate results. This could have been partly in response to some regulators' requests that book and market surplus at intermediate points be checked. For example, for year-end 1992, the California Insurance Department requested that the surplus levels for intermediate years be shown. Some actuaries felt this was a request for solvency testing, not reserve adequacy testing. If a regulator asks for tests that go beyond asset adequacy testing of the reserve, some actuaries separate such additional tests from the tests that are made to support the appointed actuary's required opinion on reserve adequacy.

In the proposed revisions to the *Model Regulation* and in the proposed revision to New York Regulation 126, in the list of items that would be required in the memorandum executive summary, the following is stated: "Comments should be provided on any interim results that may be of significant concern to the appointed actuary."

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Q. If, based on the asset adequacy tests, the reserves are judged to be inadequate, how does the actuary decide the amount of additional reserves required?

A. One method is to experiment with projections based on progressively greater amounts of starting assets. When a level that produces satisfactory results is found, reserves are strengthened to this level.

Note: The *Model Regulation* allows for a 3-year grade-in from the time the law is enacted in a particular state of any additional reserves required. However, some states, such as California, may require the additional reserves to be put up immediately.

Q. If additional reserves are to be set up, does the reserve increase go through the gain from operations, or is it booked directly to the surplus of the company?

A. Starting in 1993, there is a separate liability item for additional reserves established due to cash flow testing. The draft of the 1993 revision of the NAIC *Accounting Procedures Manual* states that these extra reserves would flow through surplus. However, this draft had not been approved as of August 1995. Some regulators strongly prefer that the additional reserves flow through gains from operations.

Q. Since it is nearly impossible to wait for year-end data and then get the statement of actuarial opinion completed by the end of February, does the actuary ever use data from prior valuation periods for the purpose of the year-end statement of actuarial opinion?

A. ASOP No. 22 allows data prior to year-end to be used in the testing, provided that significant changes have not occurred.

Approximately 50% of the actuaries who responded to the 1993 survey of valuation actuaries based their testing on results earlier than December 31, 1992. These actuaries reconciled with annual statement year-end numbers, but used the earlier (generally September 30, 1992) results if there was not a material change between that date and the end of the year. Some actuaries update results for the actual end-of-year yield curve, since this can have a major impact.

Beginning with the 1994 Statutory Annual Blanks, the appointed actuary is required to reconcile the numbers used in asset adequacy testing with specific numbers in the annual statement blank.

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There were several regulators who were not in favor of using numbers other than year-end numbers in the testing. This is because the annual statement numbers are the numbers that they have readily available, and it is on these numbers that an actuary is opining. These regulators did mention that they were particularly concerned with companies that actively traded their asset portfolios. They would prefer to grant extensions past the March deadline for those who could not complete the testing in that time frame. They did suggest that sensitivity testing could be performed earlier in the year, as long as these results could be reconciled to year-end numbers.

Q. How may the reconciliation to annual statement numbers be done if testing was done earlier than year-end?

A. Reconciliation is done to show that there were no major changes between the date of the testing and year-end. This may include showing assets by asset category for the testing date versus year-end, and showing the liabilities by major categories for the two dates.

Q. How are shareholder dividends treated in asset adequacy testing?

A. This question was asked in a survey on the 1992 asset adequacy testing. About 20% mentioned that shareholder dividends were used in the testing. Some mentioned that this was not applicable to their company, because they were employed by a mutual company.

Some actuaries said that it was not necessary to reflect shareholder dividends, since this is a function of surplus, which is not part of reserve adequacy testing. Other actuaries pointed out that there are times when the payment of shareholder dividends is a necessity for business, e.g., when required by the terms of an acquisition. Still others viewed shareholder dividends as any other expense that must be paid.

Some actuaries stated that shareholder dividends would be paid where surplus was above the target surplus. Other actuaries based the assumed payout on company experience or plan projections. Other formulas included a constant percentage of statutory gains, or a level *X* basis-points-a-year charge.

Q. How are policyholder dividends treated in asset adequacy testing?

A. Many actuaries treat policyholder dividends similar to interest credited on SPDAs or universal life. They start with the current dividend scale, and may update this scale periodically for changes that would be made to dividends due to changes in the interest rates, expenses, etc. Because

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companies declare dividends for a year at a time, a number of actuaries build in a lag factor to any dividend changes.

Q. If the current dividend scale calls for an allocation of surplus to be paid out as dividends, how should this be done?

A. Some actuaries have included this beginning allocation of surplus in the testing, clearly disclosing this in the actuarial memorandum. Others have used dividends lower than their current dividend scale, reducing the dividends for the amount contributed for surplus.

Q. With regard to the actuarial opinion, what determines whether a reserve is in the *formula reserve*, *additional reserve*, or *other amount* columns of the reserve table that appears in the scope paragraph of the opinion?

A. The NAIC *Model Regulation* contains a reserve table that gives the format for listing reserves that are to be included in the actuarial opinion. However, other than the headings on the columns, it does not explicitly describe what should go into each column. One way to prepare this table is as follows:

1. Column (i) Formula reserves—This is only for formula reserves that were subject to asset adequacy analysis. Obviously, formula reserves consist of reserves determined through a statutory formula. However, formula reserves also include any reserves that do not have a specified statutory reserve formula but are calculated by a standard methodology or procedure each year.
2. Column (ii) Additional reserves—This would be the amount of any additional reserves above the formula reserves that is being held due to the results of the asset adequacy analysis. Section 5(E) of the *Model Regulation* addresses this issue.
3. Column (iii) Analysis method—This is the method used for asset adequacy analysis. The appointed actuary may need to list more than one method for each line in the table (e.g., *cash flow testing*, *gross premium valuation*), with the corresponding reserve amounts for each method. The appointed actuary may refer to ASOP Nos. 14 and 22 in doing this.
4. Column (iv) Other amount—This is for the reserves that were not subject to asset adequacy analysis. (The most common reason for not analyzing certain business is because it is de minimis.)

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5. Column (v) Total amounts—This is the total of columns (i), (ii), and (iv).

Q. In what ways did the regulators feel that actuarial opinions and memoranda could be improved?

A. A group of actuarial insurance regulators reviewed some of the 1992, 1993, and 1994 actuarial opinions and memoranda during the past 3 years. Some of the areas they identified as requiring improvement are as follows:

1. Reliances—Some opinions and memoranda were not clear as to who developed, and took responsibility for, certain assumptions. (See Life Practice Note 1995–3 regarding new NAIC rules on data reliance.)
2. Assumption details—Insufficient details and technical analysis were sometimes provided.
3. Reinsurance—There were several cases where reinsurance assumed or ceded did not appear to be adequately modeled.
4. Off-balance-sheet items—Some actuaries did not model off-balance-sheet items, such as derivatives.
5. Sensitivity testing—Some actuaries either did not perform sensitivity testing, or did not include the results in the memorandum.
6. Investment assumptions—Some regulators expressed a concern that certain investment assumptions were not realistic.
7. A representative of the Illinois Insurance Department expressed the opinion that the executive summaries he received from some companies were too long; he would prefer to see the executive summary cover only the items requested, and highlight any problems. A representative of the California Insurance Department mentioned that he would like to see more discussion of actual or potential problems in the executive summary.

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Q. Are items that are known to occur during the cash flow testing period, such as Phase III taxes for a company no longer writing new business, included in the testing?

A. ASOP No. 22 states that “[t]he asset adequacy analysis should take into account all anticipated cash flows, such as renewal premiums, guaranteed and nonguaranteed benefits, expenses, and taxes.”

If there are significant anticipated cash flows (either positive or negative) that are not covered in the actuarial opinion and that do not have associated statement liabilities and/or assets, the actuary may want to disclose these in the actuarial memorandum and consider their effect in developing the overall opinion in a similar manner to which intermediate points in time are considered. (See the question on intermediate points in time earlier in this practice note.)

Q. Are derivatives included in the asset adequacy testing?

A. ASOP No. 7, *Performing Cash Flow Testing for Insurers*, states that “[t]he actuary should consider the assets' characteristics as well as the insurer's investment strategy.” If the insurer is including derivatives as part of the current assets or investment strategy, this requirement in the ASOP does appear to state that derivatives should be considered. If the cash flows associated with the derivatives are interest-sensitive or depend in other ways on the economic scenario, the ASOP would appear to suggest that such dependencies should be modeled.