

S O C I E T Y O F A C T U A R I E S



U.S. STATUTORY FINANCIAL REPORTING AND THE VALUATION ACTUARY

Overview

The financial reporting of insurance is necessarily a complicated process because of numerous and stringent regulatory requirements, the inherent difficulty in estimating both the probability and cost of long-term contingent events, product diversity, and new products, such as equity-linked annuities. Today there is a need for timely and accurate financial reporting because competitive influences, policyholder expectations, and a volatile economic environment have all contributed to the reduction of insurance company profit margins and surplus. Financial reporting may also require sophisticated projections of both asset and liability cash flows, balance sheets, income statements, and surplus in order to determine the long-term vitality of an insurance company.

The purpose of this guide is to enable the reader to become knowledgeable in statutory financial reporting and valuation actuary requirements. This specialty guide covers considerable ground, and a separate specialty paper could be written on many of the topics discussed below. However, the committee recognized that all the topics are intimately intertwined and discussion of one necessitates discussion of the others. The editor suggests that the reader may also wish to review specialty guides on health, reinsurance, and investments, to supplement his or her statutory financial reporting knowledge. U.S. GAAP financial reporting is covered in PASG J-2-97.

The Role of the Actuary

The actuary plays a major role in statutory financial reporting. The industry and the general public have witnessed the financial effects of both

AIDS and asset defaults on the balance sheets of insurance companies. These events have demonstrated the need for a balance between analytic rigor and broad business acumen. The actuarial profession is uniquely qualified to fill this need.

The National Association of Insurance Commissioners has endorsed an expanded role for the actuary with two actions: amending the Model Standard Valuation Law in 1990 and promulgating the Model Actuarial Opinion and Memorandum Regulation in 1991. These models represent the definition of and support for the valuation actuary concept. Also, as discussed later in this guide, the Actuarial Standards Board had adopted standards of practice covering cash-flow testing. The actuary can no longer view the annual statement in one-dimensional terms when completing reserve exhibits. Today, the actuary who is engaged in financial reporting must consider the dynamic interplay between investment and insurance cash flows.

Complying with regulatory requirements with respect to asset and reserve valuation bases is a necessary but in itself, not a sufficient discharge of duties. The actuary must also look beyond static or formula requirements; he or she should exercise professional judgment in assessing the true cost of all embedded options. For example, a financial reporting actuary should be familiar with both asset call exposure and product book value cash-out vulnerability. Finally, with the emerging minimum risk-based-capital formula requirements, there will be a need for the actuary to analyze the adequacy of surplus earmarked to cover all the actuarial "C" risks.

The Committee on Life Insurance Specialty Guides of the Society of Actuaries has provided this Specialty Guide for continuing education purposes. It is intended to provide the user with a summary of representative sources of current general knowledge. Neither the Society of Actuaries nor the Committee intends or represents Specialty Guides to be complete or their use necessarily required or sufficient for meeting continuing education requirements or any other professional competency standards of any organization.

Statutory Financial Reporting

Statutory financial reporting for life and health insurance companies refers to financial reporting on the basis of statutory accounting principles. Statutory accounting principles are those principles which are prescribed or permitted by the various state laws and regulations governing financial reports required to be filed with the state insurance departments. Although there is some variation as to what is prescribed or permitted, considerable uniformity does exist. The National Association of Insurance Commissioners codification project is attempting to create country-wide consistent accounting standards with a target implementation date in 1998.

All states require companies licensed to do business in their respective states to file a financial report at least annually (and in some states quarterly) in the form of the annual statement for life and health insurance companies. The annual statement and the accompanying instructions and guidelines are promulgated by the National Association of Insurance Commissioners. Sources of information regarding the annual statement include the following:

National Association of Insurance Commissioners. *Annual Statement—Life, Accident & Health*. Kansas City, Mo.: published yearly.

This annual statement form is commonly referred to do as the “blue blank” and its contents include:

- A statement of actuarial opinion and Jurat page
- A balance sheet, income statement for each line of business, surplus account, statement of cash flow, and increase in reserves analysis
- Exhibits on premiums, dividends, investment income, expenses, taxes, reserves, claims, and assets
- Schedules on real estate, mortgage loans, stocks and bonds, short-term investments, financial options and futures, resisted death claims, dividends, reinsurance, and premiums
- General interrogatories and notes for preparing financial statements.

Level: Basic Pages: 34

National Association of Insurance Commissioners. *Annual Statement—Life, Accident & Health—Separate Accounts*. Kansas City, Mo.: published yearly.

This annual statement form is commonly referred to as the “green blank” and is the separate account counterpart to the preceding citation.

Level: Basic Pages: 12

National Association of Insurance Commissioners. *Annual Statement Instructions—Life, Accident & Health*. Kansas City, Mo.: published annually

This reference manual provides page-by-page and line-by-line instructions for completing and filing the annual statement, and provides numerous illustrations and specific items to include or exclude from selected lines. The general section of this manual is the most useful part to the valuation actuary.

Level: Intermediate Pages: 360

National Association of Insurance Commissioners. *NAIC Accounting Practices Procedures Manual for Life, Accident & Health Insurance Companies*. Kansas City, Mo.: published yearly.

This manual is used in conjunction with the preceding reference. As stated in the preface, “This manual sets forth a compilation of current accounting practices and procedures prescribed by or permitted by insurance regulatory authorities. . .” The valuation actuary may want to focus on Part Two, Liabilities, and Part Four, Chapter 24, Reinsurance.

Level: Intermediate Pages: 155

National Association of Insurance Commissioners. *Purposes and Procedures of the Securities Valuation Office of the NAIC*. New York. published yearly, p. 1–36.

The introduction to a reference used by the National Association of Insurance Commissioners for annual statement asset value and rating determinations is featured.

Level: Intermediate Pages: 36

Richter, Anthony P. “Annual Statement of Individual Health Insurance,” Chapter 9 in *Individual Health Insurance*, ed. Francis T. O’Grady. Itasca, Ill.: Society of Actuaries, 1988, p. 169–86.

The text discusses annual statement page 5, Schedule H: Accident and Health Exhibit, and Exhibit 9: Aggregate Reserve for Accident and Health Policies. It is also a good additional source on health reserves and liabilities.

Level: Basic Pages: 18

Saunders, R. Arthur. *Life Insurance Company Financial Statements: Keys to Successful Reporting*. Chicago, Ill. and Itasca, Ill.: Teach'em, Inc. and the Society of Actuaries. 1986, p. 1–139.

This is an excellent text that gives both historical insight into the origin of the annual statement and a walk-through with examples of each page of the annual statement. It also provides algebraic development for some assumptions such as those underlying the analysis of increases in reserves. The titles for the suggested chapters, 1–3, are as follows: “Accounting and Financial Reporting,” “Principles of Life Insurance Financial Statement,” and “The NAIC Life and Health Statement.”

Level: Intermediate

Pages: 139

National Association of Insurance Commissioners. “Model Rule (Regulation) Requiring Annual Audited Financial Reports,” *Model Laws, Regulations and Guidelines*. Vol. I. Kansas City, Mo.: 1991, p. 205-1–205-7.

This model law requires annual examination by independent certified public accountants and specifies the reports that need to be filed with the insurance department. The model rule was amended in 1991.

Level: Basic

Pages: 7

National Association of Insurance Commissioners. “Risk-Based Capital (RBC) for Life and/or Health Insurers Model Act,” *Model Laws, Regulations and Guidelines*. Vol. II. Kansas City, Mo.: 1994, p. 312-1–312-13.

This law, and the amended version that applies to property and casualty insurers as well, requires a risk-based-capital report from insurers. The report is intended to be a financial solvency measure used by the regulators that takes into account the risk characteristics of a company’s investments and products.

Level: Basic

Pages: 13

Regulatory Requirements

Life insurance is a complex and regulation-intensive business. Listed below are the sources for use by the actuary to develop and maintain the necessary knowledge of regulatory requirements affecting this industry.

American Council of Life Insurance. *ACLI General Bulletin No. 5266*. Washington, D.C.: December 12, 1996.

This bulletin is a summary of state adoptions of the valuation actuary requirements. It shows the effective dates of the requirements, the legal citations for the law amendments and regulations, and any significant deviations from the National Association of Insurance Commissioners models. There will likely be updated versions of this Bulletin as additional states adopt the 1990 amendments to the Standard Valuation Law. The 1997 version is expected to be published late that year.

Level: Basic

Pages: 9

American Council of Life Insurance. *ACLI General Bulletin No. 4461*. Washington, D.C.: January 24, 1992.

At its December 1991 meeting, the National Association of Insurance Commissioners adopted the Blanks (EX4) Task Force’s interim proposal to replace the mandatory security valuation reserve with the asset valuation reserve and the interest maintenance reserve, effective with the 1992 annual statement. *ACLI General Bulletin No. 4461* contains both a summary of National Association of Insurance Commissioners actions at this meeting and asset valuation reserve/interest maintenance reserve requirements as of that date. Current requirements can be found in the *NAIC: Annual Statement Instructions—Life, Accident & Health* previously listed.

Level: Intermediate

Pages: 99

American Council of Life Insurance. *Valuation and Policy Form Compliance Service*, 5-volume set, loose-leaf service. Washington, D.C.: updated as needed.

The financial reporting actuary should consult this publication to the extent that a detailed understanding of a specific state statute is required. Member companies of the American Council of Life Insurance receive this manual; it contains the valuation and nonforfeiture statutes of each state. The American Council of Life Insurance provides updates to these laws as they occur.

Level: Intermediate

Pages: approximately 5000

American Academy of Actuaries. *Life & Health Valuation Law Manual*. Washington, D.C.: updated annually.

This manual contains summaries of the valuation laws of each state, copies of valuation-related National Association of Insurance Commissioners' model laws and regulations and actuarial guidelines, and generally distributed interpretations of various states. It is intended to help the valuation actuary comply with the "This State" requirement of the 1990 amendments to the Standard Valuation Law.

Level: Intermediate Pages: approximately 1000

National Association of Insurance Commissioners. *Codification of Statutory Accounting Principles*. Kansas City, Mo.: updated as necessary.

The National Association of Insurance Commissioners Codification of Statutory Accounting Principles Working Group has released nearly 100 issue papers. These papers can be accessed at its home page (<http://www.naic.org>).

National Association of Insurance Commissioners. *NAIC Valuation of Life Insurance Policies Model Regulation*, Vol. IV. Kansas City, Mo.: April 1995, p. 830-1-830-39.

This regulation is more commonly known as "Regulation XXX," "XXX," or "triple X." The purpose of this regulation is threefold: (1) to define commissioners reserve valuation method for policies with guaranteed non-level premiums or guaranteed non-level benefits (other than universal life policies); (2) to define commissioners reserve valuation method for flexible premium and fixed-premium universal life policies that allow the policyowner to keep the policy in force over a secondary guarantee period of more than 5 years; and (3) to introduce new 15-year select mortality factors for use with the 1980 CSO Mortality Table in determining reserves for any life insurance policy, not just those described in items 1 and 2.

Commissioners reserve valuation method basic policy reserves for policies described in items 1 and 2 are based on *contract segmentation* and *unitary* reserving methods. Regulation also defines deficiency reserves for policies described in items 1 and 2. Six tables of 15-year select mortality factors are included: male aggregate, male nonsmoker, male smoker, female aggregate, female nonsmoker, and female smoker.

Level: Intermediate Pages: 39

State of New York Insurance Department. *Regulation 147 (11NYCRR98): Valuation of Life Insurance Reserves*. November 1, 1994.

This is the New York version of the National Association of Insurance Commissioners' Valuation of Life Insurance Policies Model Regulation of April 1995. Regulation is retroactive to all business written on or after January 1, 1994 by New York companies. In large part, this regulation is consistent with the National Association of Insurance Commissioner's version, but some differences exist.

Level: Intermediate Pages: 22

National Association of Insurance Commissioners. "Standard Nonforfeiture Law for Life Insurance" and "Standard Valuation Law," *Model Laws, Regulations and Guidelines*, Vol. IV. Kansas City, Mo.: 1981 and 1992, p. 820-1-820-12 and 810-1-810-9.

These model laws serve as the basis for each state's valuation and nonforfeiture laws. Each state version may contain differences from the National Association of Insurance Commissioners' model law, but they all embody the principles of the model. Note that at the National Association of Insurance Commissioners' December 1990 meeting, the model Standard Valuation Law was amended to do implement the valuation actuary concept: ". . . whether the reserves and related actuarial items. . .when considered in light of the assets make adequate provision for. . ."

Level: Intermediate Pages: 21

National Association of Insurance Commissioners. "Minimum Reserve Standards for Individual and Group Health Insurance Contracts," in *Model Laws, Regulations and Guidelines*, Vol. I. Kansas City, Mo.: 1986, p. 10-1-10-14.

This document defines minimum claim, premium, and contract reserve standards for individual and group health coverages. It contains recommendations of gross premium valuation for testing reserve adequacy and requires annual review of tabular reserves.

Level: Intermediate Pages: 14

National Association of Insurance Commissioners.
NAIC Examiners Handbook, Vol. I. Kansas City, Mo.:
updated yearly, in loose-leaf format.

"The Life and Health Actuarial (Technical) Task Force is often asked to assist a state insurance department in interpreting a statute. . . A guideline is not a statutory revision, but merely a guide to be used in applying a statute. . ." Guidelines cover a very wide range of topics from approximations for continuous functions to deficiency reserves. Actuarial Guidelines (AG) pertinent to do this specialty guide include:

- AG 1. Valuation of Policies in which the Net Premium Exceeds the Gross Premium, 12/1978
- AG 2. Valuation of Active Life Funds Held Relative to Group Annuity Contracts, 12/1978
- AG 4. Minimum Reserves for Certain Forms of Term Insurance, revised 12/1984
- AG 5. Acceptable Approximations for Continuous Functions, 12/1979
- AG 6. Interpretation Regarding Use of Single or Joint Life Mortality Tables, 12/1979
- AG 7. Calculation of Equivalent Level Amounts, 12/1979
- AG 8. The Valuation of Individual Single Premium Deferred Annuities, 12/1980
- AG 9. Form Classification of Individual Single Premium Annuities for Application of the Valuation and Non-Forfeiture Laws, 06/1981
- AG 9A. Use of Substandard Annuity Mortality Tables in Valuing Impaired Lives under Structured Settlements, 06/1989
- AG 9B. Clarification of Methods for Immediate Deferred Annuities and Structured Settlement Contracts, 12/1988
- AG 13. Guideline Concerning CARVM, 03/1985
- AG 16. Guideline for Calculation of CRVM on Select Mortality and/or Split Interest, 12/1986
- AG 17. Guideline for Calculation of CRVM Reserves when Death Benefits are not Level, 12/1986
- AG 18. Guideline for Calculation of CRVM Reserves on Semi-Continuous, Fully Continuous, or Discounted Continuous Basis, 12/1986
- AG 20. Guideline Concerning Joint Life Functions for 1980 CSO Mortality Table, 12/1986
- AG 21. Guideline Calculation of CRVM Reserves when (b) is Greater than (a), 06/1987
- AG 25. Guideline for Calculation of Minimum Reserves and Minimum Non-Forfeiture Values for Policies with Guaranteed Increasing Death Benefits Based on an Index, 12/1989
- AG 26. Guideline for Election of Operative Dates under Standard Valuation Law and Standard Nonforfeiture Law, 12/1989
- AG 27. Actuarial Guideline for Accelerated Benefits, 06/1991
- AG 28. Statutory Reserves for Group Long-Term Disability Contracts within a Survivor Income Benefit Provision, 12/1991

- AG 29. Guidelines Concerning Reserves of Companies in Rehabilitation, 12/1992
- AG 30. Guideline for the Application of Plan Type to Guaranteed Interest Contracts (GICs) with Benefit Responsive Payment Provision Used to Fund Employee Benefit Plans, 12/1992
- AG 31. Valuation Issues vs. Policy Form Approval, 12/1992
- AG 32. Reserve for Immediate Payment of Claims, 12/1993
- AG 33. Determining Minimum CARVM Reserves for Individual Annuity Contracts, 03/1995.

Level: Intermediate

Pages: 49

National Association of Insurance Commissioners.
"Universal Life Insurance Model Regulation," in *Model Laws, Regulations and Guidelines*. Vol. III. Kansas City, Mo.: 1990, p. 585-1-585-25.

The title is wholly descriptive of the content.

Level: Intermediate

Pages: 25

Webb, Bernard L. and Lilly, Claude C. *Raising the Safety Net: Risk-Based Capital for Life Insurance Companies*. Kansas City, Mo.: National Association of Insurance Commissioners, 1994.

This book contains comprehensive information on the development of the risk-based-capital formula based on the C-1 through C-4 risks, as well as the Risk-Based Capital for Insurers Model Act. It also includes appendixes covering topics such as the various state requirements for risk-based capital, the actual Risk-Based Capital for Insurers Model Act, advisory committee reports, the December 31, 1993 National Association of Insurance Commissioners Life Risk-Based Capital Report, and suggested changes in the risk-based capital formula, among others.

Level: Intermediate

Pages: 346, including appendixes

National Association of Insurance Commissioners. *Proceedings of NAIC Committee and Task Forces*. Kansas City, Mo.: published monthly or quarterly in advance of meetings.

The regulatory requirements covering statutory financial reporting change annually. A person who claims to do be an expert in this area should be familiar with both the National Association of Insurance Commissioners' cycle for changes in these requirements and the current agenda under discussion. Direct sources for this information include minutes of proceedings of the following National Association of Insurance Commissioners Committee and Task Forces: Financial Condition (EX) Subcommittee, Accounting Practices and Procedures (EX) Task Force, Blanks (EX) Task Force; and the Valuation of Securities (EX) Task Force.

Level: Intermediate/Advanced Pages: —

Tillinghast, A Towers-Perrin Company. "Prescribed Statutory and Tax Interest Rates for the Valuation of Life Insurance and Annuity Products." Dallas, Tex.: Published yearly.

This Tillinghast publication includes all of the historical statutory valuation interest rates under the 1980 amendments to the Model Standard Valuation Law. The corresponding tax rates are also included.

Alternatively, the valuation rates can be found in *ACLI General Bulletin No. 5169* and the tax rates can be found in *ACLI General Bulletin No. 5264*.

Level: Basic Pages: 4

National Insurance Law Service. *Red Books*. Updated daily as laws are passed.

The *Red Book* is a series of loose-leaf binders (over 200) that contain a compilation of insurance-related legislation from each of the 50 states, as well as the District of Columbia, Puerto Rico, and the Virgin Islands. For each state, a number of volumes is produced that includes insurance and related laws, insurance department and related regulations, bulletins, circular letters, attorney general's opinions, and so forth. The information is updated periodically. The compilation contains the actual legislation only; summaries, interpretations, or other commentaries are not provided.

Level: Basic

National Insurance Law Service. *INSOURCE*. Chatsworth, Calif.: updated as needed.

INSOURCE is a CD-ROM database of the *Red Books* available for either a network or stand-alone PC. This service sends out a new updated compact disc each month. The information is the same as that in the *Red Books*, but since it is on a database, users are able to either look up specific citations or construct a search using keywords. One can either view the law or regulation on screen, or print or send a copy to a file where it can be incorporated into a word processing document.

Level: Basic

Dahlman, Gary E. "1980 & 1990 Amendment to the Standard Valuation Law." *Society of Actuaries Study Note 385-24-94*.

This study note develops the reasons for the 1980 and 1990 amendments and covers the use of the 1980 CSO mortality table, dynamic interest rates (including reference interest rates and Moody's indices), and indeterminate premium plans. Appendix 5 includes National Association of Insurance Commissioners' Actuarial Guidelines that are pertinent to valuation.

Level: Intermediate Pages: 79

Professional Standards

The Model Actuarial Opinion and Memorandum Regulation requires the opinion to be based on standards of practice as promulgated by the Actuarial Standards Board. These standards of practice and the companion compliance guidelines and recommendations guide professional performance and ensure the public of high-quality professional services.

In addition to do these requirements of the Actuarial Standards Board, further guidance is provided by the practice notes; however, the practices described in these notes are not binding on any actuary.

Actuarial Standards Board. *Actuarial Standards of Practice*. Washington, D.C.

No. 1: "The Redetermination (or Determination) of Non-Guaranteed Charges and/or Benefits for Life Insurance and Annuity Contracts." October 1986.

Standards an actuary should follow when evaluating effects of nonguaranteed elements contained in new business or in-force contracts are presented. The valuation actuary should use a company's stated redetermination policy as a starting point.

Level: Intermediate Pages: 9

No. 5: "Incurred Health Claim Liabilities." January 1991.

This document discusses the considerations needed when determining incurred health claim liabilities (both insured and non-insured) using tabular and development methods. Increased focus on capturing incurral data and the need for follow-up studies are highlighted.

Level: Intermediate Pages: 10

No. 7: "Performing Cash Flow Testing for Insurers." Revised July 1991.

Although the Actuarial Standards Board does not mandate cash-flow testing, this publication describes how to conduct cash-flow testing if required by management or regulators or when cash-flow testing may be appropriate. Includes definitions, projections of both asset and obligation cash flows, and determination of assumptions.

Level: Intermediate Pages: 7

No. 11: "The Treatment of Reinsurance Transactions in Life and Health Insurance Company Financial Statement." July 1989.

This standard covers the work of the ceding company and assuming company actuaries in preparing statutory, GAAP, or other financial statements containing material reinsurance transactions. It avoids detailed "how to do" instructions and encompasses the effect on the entire financial statement of material reinsurance agreement and transactions.

Level: Intermediate Pages: 4

No. 14: "When to do Cash Flow Testing for Life and Health Insurance Companies." July 1990.

This standard applies to all actuarial work in a life or health company. It gives guidance on when to do cash-flow testing (for example, default risk, structured claim settlements, and quantifying costs of embedded options).

Level: Intermediate Pages: 5

No. 18: "Long-Term Care Insurance." July 1991.

Guidance in many of the areas requiring special considerations for long-term care insurance is provided in this standard of practice. It is not intended to inhibit the development of new and appropriate actuarial practices.

Level: Intermediate Pages: 18

No. 21: "The Actuary's Responsibility to the Auditor." April 1993.

This standard concerns the actuary's responsibility to the auditor in connection with the preparation or review of audited financial statements.

Level: Intermediate Pages: 5

No. 22: "Statutory Statements of Opinion Based on Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers." April 1993.

This standard replaces Recommendation 7 of the American Academy of Actuaries and its related interpretations as guidance for Section 8 opinions by appointed actuaries which are filed in states that have enacted the 1990 amendments to the Standard Valuation Law and promulgated the Model Regulation.

Level: Intermediate Pages: 11

No. 23: "Data Quality." July 1993.

This standard gives guidance to the actuary in selecting data which underlie the actuarial work product; reviewing these data for reasonableness, appropriateness, and comprehensiveness; and making appropriate disclosures.

Level: Intermediate Pages: 5

Actuarial Standards Board. *Actuarial Compliance Guideline*. Washington, D.C.

No. 4: "Statutory Statements of Opinion not Including an Asset Adequacy Analysis by Appointed Actuaries for Life or Health Insurers." October 1993.

This standard delineates the responsibilities of the appointed actuary in providing a statement of actuarial opinion relating to reserves and other actuarial items, when such opinion is prepared in accordance with Section 7 of the Model Regulation. Opinions required under Section 7 do not include an asset adequacy analysis, nor do they require an opinion as to reserve adequacy.

Level: Intermediate Pages: 8

Actuarial Standards Board. *Actuarial Standards of Practice: "Financial Reporting Recommendations and Interpretations."*

Recommendation 7: "Statement of Actuarial Opinion for Life Insurance Company Statutory Annual Statements." Revised 1978.

This statement defines the professional responsibilities of an actuary signing the actuarial opinion, including qualification of opinion. The interpretation relating to HIV-related claims provides for additional reserves or appropriation of surplus.

This recommendation is replaced by *Actuarial Standard of Practice No. 22* and *Actuarial Compliance Guideline No. 4* in states that have adopted the 1990 amendments to the Standard Valuation Law and the accompanying Model Regulation.

Level: Intermediate Pages: 7

Recommendation 9: "Materiality." Revised 1983.

This recommendation discusses the application of the concept of materiality to actuarial aspects of the financial reporting of life insurance companies.

Level: Intermediate Pages: 4

Recommendation 11: "Statement of Actuarial Opinion for Interest-Indexed Universal Life Insurance Contracts." Adopted 1984.

This recommendation outlines the responsibility of the actuary in signing the type of statement of actuarial opinion that is described in the Universal Life Model Regulation as adopted at the December 1983 meeting of the National Association of the Insurance Commissioners.

Level: Intermediate Pages: 7

The American Academy of Actuaries Practice Notes are published by specialty work groups brought together by the Academy. They are not promulgated by the Actuarial Standards Board. The purpose of the notes is to assist actuaries preparing statements of opinion by giving examples of common approaches related to the work. The format is question and answer. Life Practice Notes cover life insurance and annuities.

Health Practice Notes (published November 1995)

- 1995-1 General Considerations
Pages: 10
- 1995-2 Small Group Medical Business
Pages: 13
- 1995-3 Large Group Medical Business
Pages: 6
- 1995-4 Individual Major Medical Business
Pages: 13
- 1995-5 Individual Disability Income Insurance
Pages: 17
- 1995-6 Group Long-Term Disability Insurance
Pages: 13
- 1995-7 Medicare Supplement
Pages: 8
- 1995-8 Small Group Certification
Pages: 18
- 1995-9 Long-Term Care Insurance Business
Pages: 4

Life Practice Notes (published December 1995)

- 1995-1 General Considerations
Pages: 14
- 1995-2 Procedures to Follow in Accepting or Resigning the Position of Appointed Actuary for Life or Health Insurers in the United States, Pages: 6
- 1995-3 Reliance upon Third Parties
Pages: 12
- 1995-4 Interest Rate Models
Pages: 8
- 1995-5 Use of the AVR/IMR in Cash Flow Testing, Pages: 4
- 1995-6 Modeling Bond Default Risk
Pages: 6
- 1995-7 Modeling Mortgage and Real Estate C-1 Risk, Pages: 6
- 1995-8 Collateralized Mortgage Obligations
Pages: 5

1995-9 Alternative Methods of Testing for Obligation Risk, Pages: 4
 1995-10 Special Issues for Valuing Single-Premium Group Annuity Contracts
 Pages: 3
 1995-11 Special Issues Involving Structured Settlements, Pages: 7
 1995-12 Notification of Reserve Misstatement
 Pages: 4
 1995-13 Expenses
 Pages: 4
 1995-14 Report Preparation
 Pages: 3

Level: Intermediate

Valuation Methodology

The diversity of products offered by life insurance companies (for example, universal life, guaranteed investment contracts, and long-term disability income) suggests the need for different valuation approaches and methodologies in estimating the present value of various contingent events. In this section the reader is introduced to sources that provide both the mathematics underlying present value theory and acceptable valuation methodologies that the actuary employs to comply with regulation.

Bowers, Newton Jr. et al. *Actuarial Mathematics*. 2nd Ed. Chapters 4–10 and 15. Society of Actuaries: Schaumburg, Ill.: 1997.

This textbook on the mathematics underlying basic valuation factors has an approach based on statistical applications. Titles of the featured chapters are as follows: “Life Insurance,” “Life Annuities,” “Benefit Premiums,” “Benefit Reserves,” “Analysis of Benefit Reserves,” “Multiple Life Functions,” “Multiple Decrement Models,” and “Insurance Models Including Reserves.”

Level: Basic Pages: 268

Jordan, C.W. *Life Contingencies*. Chapters 1–7 and 9–15. Society of Actuaries: Chicago, Ill.: 1982.

This is the predecessor to *Actuarial Mathematics*; its approach is based on commutation functions.

Level: Basic Pages: 390

Shaplan, Robert. “Reserves and Liabilities for Individual Health Insurance,” Chapter 5 in *Individual Health Insurance*, ed. Francis T. O’Grady. Society of Actuaries: Itasca, Ill.: 1988.

The authors discuss development of premium reserves, policy reserves, claim reserves, and liabilities (including claim run-out method).

Level: Basic Pages: 23

Barrett, Joan C. “Overview of Reserve Practices in Group Insurance.” *Society of Actuaries Study Note 385-25-93*.

This study note defines reserve methods for comprehensive major medical, long-term disability, and term life products, along with providing numerical examples.

Level: Intermediate Pages: 43

Tullis, Mark A. and Polkinghorn, Phillip K. *Valuation of Life Insurance Liabilities*, 3rd ed. Chapters 1–7 and 9. Actex Publications: Winsted, Conn.: 1996.

The authors have written the single best source for valuation of life insurance liabilities. Chapters covered include: “Types of Valuations and Basic Requirements,” “Reserve Methodologies and Bases,” “Types of Reserve Factors,” “Valuation of Interest-Sensitive Life Products,” “Valuation of Annuities,” “Valuation of Variable Products,” “Miscellaneous Reserves,” and “The Valuation Actuary.”

Level: Intermediate Pages: 130

American Academy of Actuaries. *A Report to the National Association of Insurance Commissioners Life and Health Actuarial Task Force on Equity-Indexed Annuities*. November 1996.

This report discusses how this hybrid product, which contains features of a variable annuity and some features of a fixed annuity, fits into the existing accounting models. Statutory, GAAP, and tax accounting treatments are discussed. With the diversity of products, no single accounting system is recommended, but consistent valuation of both assets and liabilities is strongly endorsed.

Level: Intermediate Pages: 8

Valuation Actuary

The essential elements of today's statutory valuation standards have their inception in the early 1940s with the introduction of Standard Valuation Law. Since that time, there have been many changes in the products sold, policyholder sophistication, and investment climate that render this standard as too conservative in some cases and inadequate in others. Given all of the economic, investment and financial risks, and product permutations that exist among life insurance companies, it is unrealistic for one to expect a "cookbook" valuation standard that provides both the measure of conservatism sought by the National Association of Insurance Commissioners and equity for the life insurance companies that have comparatively lower risk profiles.

The National Association of Insurance Commissioners recognized the need to expand the definition of valuation adequacy beyond the original definition and thus adopted the model Actuarial Opinion and Memorandum Regulation at its June 1991 meeting.

What this will probably mean for insurance companies with admitted assets in excess of \$500 million (and varying requirement for companies of other sizes) is that the state in which the company is domiciled requires the company to appoint a valuation actuary to conduct asset adequacy analysis. Practically speaking, to do such an analysis, the valuation actuary generally will need to conduct cash-flow testing using at least the seven scenarios required by the Model Regulation. The testing will require sophisticated modeling that recognizes the dynamics of investment and insurance cash flows. The following sources are recommended to develop the required knowledge of the valuation actuary.

National Association of Insurance Commissioners. "Actuarial Opinion and Memorandum Regulation," *Model Laws, Regulations and Guidelines*. Vol. IV. Kansas City, Mo.: p. 822-1-822-25.

The requirements of this model are quite detailed. For companies affected, an asset adequacy analysis is required. It contains the following components: (1) "product descriptions including market description, underwriting, and other aspects of a risk profile. . ." (2) assets and reserves in force; (3) investment and disinvestment assumptions; and (4) the actuarial opinion.

Level: Intermediate

Pages: 25

Claire, Donna R. and Milnes, Esther H. "Description of New York Regulation 126." *Society of Actuaries Study Note 443-84-88*.

The authors provide an outline of the New York regulation that served as the precursor of the National Association of Insurance Commissioners Model.

Level: Intermediate

Pages: 31

Claire, Donna R. "Amendments to New York Regulation 126." *Society of Actuaries Study Note 443-85-89*.

Amendments to the preceding source are provided.

Level: Intermediate

Pages: 6

State of New York Insurance Department. *Regulation 126 (11NYCRR95)*: "Regulations Governing an Actuarial Opinion and Memorandum." December 21, 1994.

This is the New York version of the National Association of Insurance Commissioners' Actuarial Opinion and Memorandum Regulation.

Level: Intermediate

Pages: 41

Stapleford, Robert H. and Stewart, Kenneth W. "Introduction to do the Formation of Investment Strategy for Life Insurance Companies and Pension Plans." *Society of Actuaries Study Note 220-24-91*.

The authors define the kinds of investment risks, the importance of quantifying the costs of embedded options for different products, and the coordination of crediting strategy with competition's actions.

Level: Basic

Pages: 34

Fabozzi, Frank J. *The Handbook of Fixed Income Securities*. 4th ed., Homewood, Ill.: Business One Irwin, 1995.

As mentioned above, the actuary's role was broadened by the National Association of Insurance Commissioners' December 1990 amendment to the Model Standard Valuation Law. This book is an excellent resource for both teaching and expanding the actuary's knowledge of fixed assets. Topics covered include kinds of securities, risks, duration, asset/liability matching, guaranteed investment contracts, options and futures, and interest rate swaps. Due to the breadth of this text, financial reporting actuaries may want to consider only those chapters that are relevant to their companies.

Level: Intermediate/Advanced

Pages: 1402

Society of Actuaries Task Force on the Financial Implications of AIDS. "The Financial Implications of AIDS for Life Insurance Companies in the United States." *Transactions of the Society of Actuaries* XLII (1990), p. 639-708.

Task Force members recommend the following factors: cash-flow testing; an increase in reserves before appropriation of surplus and loading factors for AIDS (no new valuation table at this time); methodology for estimating AIDS mortality rates; importance of geographical and product adjustments; funding alternatives; and different reserve methods. There is a supplemental disability insurance report on page 709 of the same volume.

Level: Advanced Pages: 70

Tilley, James A. "An Actuarial Layman's Guide to Building Stochastic Interest Rate Generators." *Society of Actuaries Study Note 380-24-92*.

This study note is a good starting point for developing stochastically generated interest rates to be used in cash-flow testing.

Level: Intermediate Pages: 28

Valuation Actuary Symposium Proceedings. Society of Actuaries. Published yearly.

This annual publication provides an in-depth discussion of issues concerning the valuation actuary.

Level: Intermediate Pages: 800

Dynamic Financial Condition Analysis Handbook. Schaumburg, Ill.: Society of Actuaries, 1995.

This handbook is intended to encourage more universal and rigorous financial analysis and review. Topics covered include liability modeling, analysis of assets, analysis of company and policyholder behavior, general approaches for financial analysis, and liquidity and surplus enhancements.

Level: Intermediate/Advanced Pages: 300

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