

**1987 VALUATION  
ACTUARY HANDBOOK**

Appendix 5

(From Interest Sensitive Products Seminar of May 21, 1986)

**LITERATURE AVAILABLE FOR CONTINUING  
EDUCATION OF VALUATION ACTUARY (1984-1985)**

**Donald D. Cody**

(Prepared for the SOA Individual Life Insurance and Annuity Product Development Section.)

This is a continuation of my January 20, 1984, list of literature available, prepared for the Joint Committee on the Role of the Valuation Actuary in the United States, which was widely circulated by the AAA and the SOA in 1984.

**I. GENERAL**

1. **"Final Report of the Joint Committee on the Role of the Valuation Actuary in the United States," February, 1985.**

Sent to all members of the AAA and SOA at the direction of the Boards, the report makes recommendations as to an expanded role for the valuation actuary and as to principles underlying the valuation of life insurance companies for solvency and solidity purposes. It constitutes a blue-print for consideration of development in organization, responsibilities, practice, qualifications, management relations, statutes, regulation, research and education. It should be studied for an appreciation of the widespread activities on-going in the AAA, SOA, NAIC and management.

2. Textbook, "Controlling Interest Rate Risk," by the Fixed Income Research Group of Morgan, Stanley & Company (John Wiley & Sons, 1986, but not yet published).

This book will provide state-of-the-art techniques for fixed income portfolio managers, with chapters on term structure of interest rates, duration, options, synthetic options, futures, simulation and optimization, special analytical techniques and instruments, and applications to various institutions. Chapter 9, written by Dr. James A. Tilley, FSA, covers "Risk Control Techniques for Insurance Companies." While not aimed at the appropriateness of reserves and surplus, which are the major concern of the valuation actuary, a this textbook will fill a void in authoritative literature on the tools available for optimization of product/asset policy.

## **II**    SOA

1. The SOA Combination of Risk Task Force presented major research findings on combination of C-1, C-2 and C-3 Risks at PD 14 "Target Surplus Formulas" at the October 1985 Annual SOA meeting in New Orleans. RSA 11:4 (1985).
  - o M. E. Mateja: Discussion of Cash Flow Based Surplus techniques.
  - o J. A. Geyer: Discussion of construction of probability distribution functions and application in computer modeling.

- o J. A. Geyer and M. E. Mateja: Discussion Note on C-3 Risk associated with SPDA products to benchmark.
- o D. D. Cody: Discussion on relationships of designated surplus or target surplus used in pricing and management based financials.

The Geyer - Mateja discussions are basic to understanding combinations of C-1, C-2 and C-3 Risks. The Discussion Note on SPDA is especially enlightening as to the effects of C-3 Risk, and the approximate formula for surplus needed on SPDA is likely to become important in practice, with possible extension to U/L products.

## 2. The SOA Committee on Life Insurance Company Valuation Principles

This committee has submitted a report to the SOA Board of Governors recommending principles of valuation. Attached to that report is an "Attachment A," setting forth illustrative practices put together by John Montgomery and Donald D. Cody based on the research to date by the SOA Committee on Valuation and Related Areas in its Task Forces.

Donald D. Cody and John O. Montgomery "Illustration of a Cohesive Structure of Valuation Practice for Statutory Financials." That paper presents a comprehensive layout of illustrative practice which might be used by a valuation actuary who decides to avail himself or herself of the full scope of research to date.

3. SOA Symposium for the Valuation Actuary, held on November 19-20, 1985, at O'Hare Marriott, Chicago.

A volume containing the presentation at this symposium is now available. It provides an excellent view of practices in use, various developments under way and problems under consideration.

4. TSA Papers:

- o J. D. Stiefel III "The Guaranteed Investment Contract (GIC)" TSA XXXVI (1984).
- o R. P. Clancy "Options on Bonds and Application to Product Pricing" TSA XXXVII (1985) Preprint April 10, 1985.
- o A. M. Fen "Interest Rate Futures: An Alternative to Traditional Management of Guaranteed Investment Contracts" TSA XXXVII (1985) Preprint April 10, 1985.

These are three excellent papers addressing modern paradigms and approaches to pricing and asset policy coordination on interest sensitive products. While applications to testing reserves and determining surplus needed are not treated, other than briefly in the first paper, these papers provide important background for the valuation actuary.

III. AAA COMMITTEE ON LIFE INSURANCE FINANCIAL REPORTING

July 1985 Discussion Draft of "Standards for Valuation Actuaries (1) Qualification Standards, (2) Standards of Practice."

(2) is a redraft of Recommendation 7. This discussion draft has drawn 40 responses, most quite lengthy. The committee is undertaking another draft, introducing C-1 and C-2 Risks and making other revisions suggested by the responses.

#### **IV. NAIC AND STATE INSURANCE DEPARTMENTS**

1. **"Report of the NAIC (Rugland) Special Advisory Committee on the Statement August 1, 1985 of Actuarial Opinion for Life and Health Insurers."**

Due to the concerns of the NAIC Life and Health Actuarial Task Force for the interim before an enhanced role of the Valuation Actuary can be in effect, this advisory committee was asked to make recommendations for steps feasible under existing statutes with respect to the good sufficiency of reserves for solvency. Among other things, it was recommended that the actuary signing the Opinion also prepare an internal report to management explaining the material considerations underlying the Opinion, including, but not limited to, consideration of future investment income and insurance cash flows on interest sensitive products under a reasonable range of future interest rates. Also, the actuary signing the Opinion should indicate whether the Opinion is influenced by any continuing business assumptions, and if so, how. The regulators could call for this report, if circumstances warranted as part of surveillance, to ascertain what findings had been considered.

These recommendations do not embrace the full recommendations of the Joint Committee, but do suggest documentation of how C-1, C-2 and C-3 Risks

have been considered in testing good sufficiency of reserves. The NAIC Committees responsible in this area have approved these recommendations for implementation on 1987 Annual Statements. Study of the Report is recommended.

2. "New York State on Annuities and Guaranteed Investments Contracts," 1985.

The Life Insurance Council of N.Y. (LICONY) has task forces working on recommendations for appropriate regulations for setting "reasonable" reserves recognizing C-1 and C-3 Risks, notably one on the "Actuarial Opinion and Memorandum With Respect To Contract Reserves," and another on "Annuities Reserve Valuation Method and Penalty Reserve To Be Held, If No Acceptable Opinion has Been Submitted." Attention should be paid to these activities, since they reflect application of the research in practice done by the SOA Task Forces on C-1 and C-3 Risks. There is a possibility that these efforts might eventually be extended to U/L contracts, which are also interest sensitive.

V. CANADA

1. "Final Report of the CIA Special Committee on the Role of the Valuation Actuary to the CIA Council," October 31, 1985.

Concerned about declining surplus margins, the CIA has exposed a recommendation to make the valuation actuary responsible for extending the Opinion to the whole financial solidity of a life insurance company, not only reserves and surplus needed for capacity utilized by in-force business, but also for the

adequacy of surplus for on-going business and planning. This is similar to the responsibility of the Appointed Actuary in the U.K.

2. CLHIA Circular #4199F, November 27, 1985, "Minimum Continuing Capital and Surplus Requirements for Life Insurance Companies."

Pending possible adoption of the CIA report on the role of the valuation actuary, the Canadian Life and Health Insurance Association has exposed for testing an elaborate formula for minimum surplus, which reflects the impact of C-1, C-2 and C-3 Risks with detailed attention to the product, liability and asset characteristics of each company. While with recognized shortcomings as to C-3 Risk, since extent of liability/asset matching is not recognized, and elsewhere, the formula is in a format in which a valuation actuary would probably express surplus needed after a full C-1, C-2 and C-3 Risk analysis.

The Canadian documents are well worth studying.

## LITERATURE ON ANALYSIS OF RISK

<u>Study Note Code</u>	<u>Study Note Title</u>
7BA-201-79	Valuation of Liabilities
10LU-503-81	NAIC Actuarial Guidelines
10LU-506-76	Strengthening of Reserves
7BA-304-83	Principles of Life Insurance Financial Statements
10GB-203-76	Life Insurance Accounting: Financial Reporting and the Actuary
10GB-215-83	Life Insurance Financial Statements
10LB-510-83	Actuarial Review of Reserves & Other Annual Statement Liabilities
10GC-208-81	CIA Recommendations for Insurance Company Financial Reporting
10GC-217-84	CIA/CICA Report on Financial Reporting for Life Companies
10GU-207-76	Life Insurance Accounting: NAIC Annual Statement Aspects of Group Life Ins.
10GU-206-76	Life Insurance Accounting: Accident & Health Statutory Reporting in the U.S.
8-201-79	Interest Rate Assumptions & the Relationship between Asset & Liability Structure
8-203-85	Optimal Cash Flow Matching
8-204-85	Duration: Its Development and Use in Bond Portfolio Management
10LB-509-83	1980 Amendments to the Standard Valuation Law
7BA-202-79	Group Life Insurance Reserves
10LC-610-83	Recommendations Concerning Actuarial Principles & Practices