

Note: This version of ASOP No. 7 is no longer in effect.  
It was superseded in 2001 by ASOP No. 7, Doc. No. 081,  
which was superseded in 2002 by ASOP No. 7, Doc. No. 089.

**ACTUARIAL STANDARD  
OF PRACTICE  
NO. 7**

**PERFORMING CASH FLOW TESTING  
FOR INSURERS**

**Revised Edition**

**Developed by the  
Joint Casualty/Life Cash Flow Testing Task Force of the  
Actuarial Standards Board**

**Adopted by the  
Actuarial Standards Board  
July 1991**

**(Doc. No. 031)**

## TABLE OF CONTENTS

Transmittal Memorandum	iv
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### PREAMBLE

Section 1. Purpose, Scope, and Effective Date	1
1.1 Purpose	1
1.2 Scope	1
1.3 Effective Date	1
Section 2. Definitions	2
2.1 Asset	2
2.2 Asset Risk	2
2.3 Cash Flow Testing	2
2.4 Cash Flow	2
2.5 Insurer	2
2.6 Investment-Rate-of-Return Risk	2
2.7 Obligation	2
2.8 Obligation Risk	2
2.9 Scenario	2
Section 3. Background and Historical Issues	2
Section 4. Current Practices and Alternatives	3
Section 5. Analysis of Issues and Recommended Practices	4
5.1 Scope of Cash Flow Test	4
5.2 Allocation of Assets	4
5.3 Scenarios	4
5.3.1 Range of Scenarios Consistent with Purpose of Test	4
5.3.2 Number of Scenarios	4
5.3.3 Disclosure of Limitations	4
5.4 Projection of Asset Cash Flows	4
5.4.1 Asset Characteristics	4
5.4.2 Investment Strategy	5
5.5 Projection of Obligation Cash Flows	5
5.5.1 Obligation Characteristics	5
5.5.2 Management Policy	6
5.6 Determination of Assumptions	6

5.6.1	Sensitivity Testing	6
5.6.2	Internal Consistency	6
5.6.3	External Requirements	6
5.7	Development of Conclusions	7
Section 6.	Communications and Disclosures	7
6.1	Reliance on Another	7
6.2	Actuarial Report	7
6.3	Special Communications and Disclosures	7
6.4	Deviation from Standard	8

July 1991

**TO:** Members of the American Academy of Actuaries and Other Persons Interested in Cash Flow Testing for Insurers

**FROM:** Actuarial Standards Board (ASB)

**SUBJ:** Revised Version of Actuarial Standard of Practice No. 7

This booklet contains the final version of revised Actuarial Standard of Practice (ASOP) No. 7, with the new title of *Performing Cash Flow Testing for Insurers*. The document contains changes made by the Joint Casualty/Life Cash Flow Testing Task Force after its review of the fifteen letters of comment received on the exposure draft of the proposed standard during the exposure period, which ended December 15, 1990. The task force's responses to the comments are described below.

### Background

Cash flow testing has become an increasingly important aspect of actuarial work in the insurance industry. Volatility of investment rates of return, fluctuating operating results, and liquidity problems have contributed to this increased attention to the projection and comparison of asset and obligation cash flows.

Development of actuarial standards of practice in the cash flow testing area was originally undertaken separately for the life and health and the property and casualty specialties. The first to be published was ASOP No. 7, *Concerning Cash Flow Testing for Life and Health Insurance Companies*. This was developed by the American Academy of Actuaries (AAA) Committee on Life Insurance Financial Reporting in conjunction with the Life Committee of the ASB, and was adopted by the ASB in October 1988.

Subsequently, the Casualty Committee of the ASB, through its Valuation Subcommittee, developed a proposed standard titled *Cash Flow Testing for Property and Casualty Insurers*. This draft was presented to the ASB in April 1990. The ASB decided that the document should be revised so that there would be one broad standard that would apply to life and health insurers as well as to property/casualty (P/C) insurers. A Joint Casualty/Life Cash Flow Testing Task Force was appointed by the ASB to accomplish this. The resulting draft was approved for exposure in July 1990.

The standard of practice contained in this booklet is designed to provide guidance to actuaries on how to perform cash flow testing—also referred to as *cash flow analysis*—for a life, health, property, or casualty insurer. This guidance applies in many areas of actuarial work, including actuarial appraisals,

reserving or pricing studies, evaluation of investment strategy, and financial projections or forecasts.

This revised and expanded standard supersedes the previous version (Doc. No. 009) of ASOP No. 7, referred to above.

### Responses to Comments on Exposure Draft

Numbers and headings before the comments refer to sections of the standard. The task force responses are printed in **boldface**.

- 1.2 Scope—Several respondents asked whether the standard applies to pension actuarial work. **The task force believes that it does not.**

—Several commentators suggested that the scope should contain more examples of the uses of cash flow testing. **The task force believes it is not necessary to be exhaustive. Pricing and reserving are now listed separately for clarity.**

2. Definitions—One respondent suggested that a definition of *scenario* is needed. **A definition was added, and corresponding adjustments made in sections 4 and 5.2.**

—One commentator suggested that the phrase, “expectations or assumptions” in the definitions of *asset*, *investment-rate-of-return*, and *obligation risks* may be redundant. **The task force believes that using both terms ensures a broad interpretation of the risk definitions.**

- 2.1 Asset—One respondent questioned whether cash flow testing occurs when only obligation cash flows are studied. **It is the task force's opinion that the definition of *cash flow testing* makes clear that both asset and obligation cash flows are included. If obligation (or asset) cash flows are projected but not compared to asset (or obligation) cash flows implicitly or explicitly, then cash flow testing is not being performed.**

- 2.3 Cash Flow Testing—Several letters contained questions about this definition, one asking if it clearly included new business. **The definition in the exposure draft was the same as the definition in ASOP No. 14, *When to Do Cash Flow Testing for Life and Health Insurance Companies*. The task force believes that the two definitions should remain consistent, and also that they are sufficiently broad to cover testing of cash flows from past as well as future business. Nevertheless, to clarify the new-business issue, the phrase, “or come into existence subsequently,” was added at the end of the first sentence of section 5.1.**

—Another question raised about this definition was whether cash flow testing requires

measurement of the effect of economic scenarios on cash flows or whether less complex sensitivity testing is sufficient. **The task force believes that at least one scenario is inherent in any cash flow test and that sensitivity testing of key assumptions should also be part of the test. The task force believes that these issues are clearly addressed in sections 5.2 and 5.5.1.**

- 2.5 Insurer—Several commentators questioned whether the definition was too broad in that it could be construed to apply to anyone risking financial loss. **The task force concluded that the broadness of the definition is appropriate, in that it includes self-insurers. If some other person or entity could be construed as an insurer under the definition, and an actuary performed cash flow testing for that person or entity, that work would properly be held to the standard.**
- 2.7 Obligation—The issue of whether expenses should be explicitly mentioned as part of obligations was raised. **Without changing the definition, which was already sufficiently broad to include expenses, the task force added the phrase, *expense control strategies*, in section 5.4.2 as a part of management policy.**
4. Current Practices and Alternatives—Two respondents recommended adding a step in the description of the typical approach to cash flow testing. **The second step, “select and validate models for assets and obligations,” was added.**

Several commentators indicated that the meaning of the phrase *hypothetical assets* was unclear. **This wording has been eliminated.**

- 5.1 Scope of Cash Flow Test—Two respondents wished to have guidance on cross-subsidies between lines of business. **The task force believes that more detailed guidance in this area should not be provided because consideration of cross-subsidies is dependent on the purpose and use of the cash flow test.**
- 5.2 Allocation of Assets—Two respondents wanted disclosure and analysis of remaining assets and obligations if the actuary were reviewing a limited portion of a company. **The section was modified to clarify the intent, but no mandate was given to test the remaining assets and obligations. Such a mandate might require expansion of the scope of work well beyond that needed by the actuary's client or employer.** (Note: This is a new section number. The numbering of other sections in section 5 has been adjusted accordingly.)

—One respondent suggested that the actuary be required to comment on “any allocation of assets inconsistent with prior or contemporaneous reports.” **The task force understands the reference to the possible assignment of the same asset to more than one liability. A sentence was added to clarify this issue.**

- 5.3 Scenarios—Two commentators suggested reference to stochastic scenarios. **This recommendation was followed.**

Several respondents wanted more clarity and discussion on the question of selecting the number of scenarios. **No changes were made, as the task force believes the question was adequately covered.**

- 5.4 Asset Characteristics—Several respondents suggested that we expand our list of examples. **The task force didn't see the need to add all of the suggestions, but “mortgage-backed securities” was added to the list of examples of assets that are highly influenced by external events.**

—Suggestions were made that the market value of assets and the possible loss of principal in liquidating certain kinds of assets be given more consideration. **Section 5.4.1(c) refers to the cost of converting assets into cash.**

- 5.4.2 Investment Strategy—Two respondents suggested listing tax implications among the strategy considerations. **The task force believes that this issue is adequately addressed in section 5.6.3.**

- 5.5.1 Obligation Characteristics—Two individuals commented on the difficulty of assessing the solvency of a reinsurer, which might be construed to be required by section 5.5.1(b). **The task force found this a valid issue, and adopted with modification a suggested practicality consideration from one of the letters.**

- 5.5.2 Management Policy—In several comment letters, the issue was raised of whether this draft standard applied to existing or future business. **The intention was to apply the standard to future or existing business, depending on the purpose of the cash flow testing. However, the task force believes that even when existing business alone is being tested, the actuary may wish to consider the impact of the company's future plans on expenses. The task force added “expense control strategies” to the list of considerations that might affect a cash flow projection.**

- 5.6.1 Sensitivity Testing—There were several questions indicating that the draft needed clarification as to how the actuary should determine that sensitivity testing had been adequately addressed. **A new sentence was added on this point.**

—The sensitivity testing section of the exposure draft contained a sentence that described considerations in determining whether the model produces reasonable estimates of expected cash flows. It was suggested that this sentence is more relevant to the development of conclusions. **The sentence was moved, in modified form, and is now the second**

paragraph of section 5.7.

- 5.6.2 Internal Consistency—Two commentators suggested that this section did not cover a broad enough range of interrelationships. **The task force agrees, and has adopted more comprehensive wording.**
- 5.7 Development of Conclusions—One respondent sought guidance on “choosing the proper answer” when results differ with different scenarios. **The task force believes that actuarial judgment based on the situation at hand should not be supplanted by specific guidance.**
6. Communications and Disclosures—Several respondents commented on the need for written actuarial reports, which are recommended in section 6.2. **The task force noted that written documentation is becoming ever more essential, but also believes that not all written actuarial reports need to be comprehensive. Some situations may call for a brief document. If the situation does not require any report, the provisions of section 6.4 apply.**

—A commentator asserted that documentation standards for in-house actuaries should be less stringent than for public-practice actuaries. **The task force disagrees with this comment in general, believing that the particular situation should determine the degree of documentation.**

—One commentator suggested requiring documentation of the fact that actuarial projections of future contingent events will not necessarily conform to actual future events. **While the task force agrees that this is a basic uncertainty in cash flow testing, it concluded that the need for such a caveat is dependent on the intended purpose and use of the testing.**

—Several respondents suggested that the relative likelihood of the scenarios should be disclosed. **The task force agrees with this comment and section 6.3(b) was modified accordingly.**

There were a number of editorial suggestions in the letters that the task force found helpful in revising the document. The task force and the ASB thank the respondents for their thoughtful and useful comments on the exposure draft.

This final version of the standard was adopted by the ASB on July 17, 1991.



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# ACTUARIAL STANDARD OF PRACTICE NO. 7

## PERFORMING CASH FLOW TESTING FOR INSURERS

### Revised Edition

#### PREAMBLE

##### Section 1. Purpose, Scope, and Effective Date

- 1.1 Purpose—This standard of practice sets out recommended practices and considerations that bear on the actuary's professional work in the area of cash flow testing, also referred to as *cash flow analysis*, whenever projections and comparisons of cash flows are performed for an insurer.
- 1.2 Scope—This standard applies to cash flow testing for life, health, property, or casualty insurers. Cash flow testing may be part of many types of analyses, such as:
- a. determination of reserve adequacy;
  - b. pricing studies;
  - c. evaluations of investment strategy;
  - d. financial projections or forecasts;
  - e. actuarial appraisals; and
  - f. testing of future charges or benefits that may vary at the discretion of the company (e.g., policyholder dividend scales and other non-guaranteed elements of insurance and annuity contracts).

Elements of cash flow testing include asset cash flows, obligation cash flows, and the economic and operating assumptions affecting cash flows.

- 1.3 Effective Date—This standard of practice is effective October 17, 1991.

## Section 2. Definitions

- 2.1 Asset—Any tangible or intangible resource that can generate receipts or reduce disbursements.
- 2.2 Asset Risk—The risk that the amount or timing of items of cash flow connected with assets will differ from expectations or assumptions as of the valuation date for reasons other than a change in investment rates of return. *Asset risk* includes delayed collectibility, default, or other financial non-performance.
- 2.3 Cash Flow Testing—The process of projecting and comparing, as of a given date called the *valuation date*, the timing and amount of asset and obligation cash flows after the valuation date.
- 2.4 Cash Flow—Any receipt or disbursement of cash.
- 2.5 Insurer—An entity that accepts the risk of financial losses or, for a specified time period, guarantees stated benefits upon the occurrence of specific contingent events.
- 2.6 Investment-Rate-of-Return Risk—The risk that investment rates of return will depart from expectations or assumptions as of the valuation date, causing a change in the amount or timing of asset or obligation cash flows.
- 2.7 Obligation—Any tangible or intangible commitment by, requirement of, or liability of an insurer that can reduce receipts or generate disbursements.
- 2.8 Obligation Risk—The risk that the amount or timing of items of cash flow connected with obligations will differ from expectations or assumptions as of the valuation date, for reasons other than a change in investment rates of return or a change in asset cash flows.
- 2.9 Scenario—A set of economic and operating assumptions on the basis of which cash flow testing is performed.

## Section 3. Background and Historical Issues

Actuaries have been performing financial projections for many years. Various cash flow elements have often been an integral part of these projections. The large increase in the level and volatility of investment rates of return that occurred in the 1970s and 1980s caused significant swings in asset values, as well as changes in cash flow expectations. In addition, fluctuating operating results have led to increased attention to improving the measurement of the financial security of insurers. As a result of these changes, cash flow testing has become an increasingly important aspect of actuarial work.

#### Section 4. Current Practices and Alternatives

Some states require comparison of asset and obligation cash flows related to items contained in the statutory financial statement. Other instances where cash flow testing is used include internal financial or investment planning, rate of return calculations, and assessments of an insurer's ability to meet its obligations as they come due.

Common approaches to cash flow testing typically follow these steps:

1. Identify which assets and obligations are to be included in the cash flow test.
2. Select and validate models for assets and obligations.
3. Select an appropriate scenario or set of scenarios, either deterministic or stochastic.
4. Project the cash flows of the selected assets and obligations.
5. Develop conclusions based on analysis of the cash flow projections.

There are variations on this process. For example, if cash flow testing is used to test the effects of changes in investment strategy, specific assets may not be identified in the initial step of the process. It may be sufficient instead to test on the basis of variations in asset portfolio characteristics such as yield and duration.

## STANDARD OF PRACTICE

### Section 5. Analysis of Issues and Recommended Practices

5.1 Scope of Cash Flow Test—A cash flow test may involve part or all of an insurer's obligations that are outstanding as of the valuation date or come into existence subsequently. The obligations and the assets to be included in the cash flow test should be specifically identified.

5.2 Allocation of Assets—In the case of a cash flow test involving only a portion of the assets or a portion of the obligations, the actuary should disclose whether the adequacy of any remaining assets to support the remaining obligations has been examined and if not, why not.

The actuary should be satisfied that the same block of assets is not being improperly used to support different blocks of obligations, either within the cash flow test being performed or in that test and one or more contemporaneous tests.

5.3 Scenarios—The scenario is a key element of cash flow testing. Often, more than one scenario will be analyzed. Scenarios may be generated by either deterministic or stochastic methods.

5.3.1 Range of Scenarios Consistent with Purpose of Test—In some situations, the scenario(s) to be tested may be specified by the client or employer, or by regulation. In other situations, the actuary may develop the scenario(s). In all cases, the actuary should be satisfied that the scenario testing reflects a range of conditions that is consistent with the purpose of the cash flow test.

5.3.2 Number of Scenarios—In determining the number of scenarios that will reflect a range of conditions that is consistent with the purpose of the cash flow test, the actuary should consider the relative importance of the investment-rate-of-return risk, asset risk, and obligation risk.

5.3.3 Disclosure of Limitations—When the actuary draws conclusions from the cash flow test, any limitations due to the number, types, or likelihood of scenarios used should be disclosed.

5.4 Projection of Asset Cash Flows—In order to project an insurer's asset cash flow, the actuary should consider the assets' characteristics as well as the insurer's investment strategy. The actuary should be satisfied that the model used to reflect these considerations produces reasonable estimates of expected asset cash flows.

5.4.1 Asset Characteristics—The characteristics of an asset affect the timing and amounts of

its cash flow items. The cash flows of some assets are relatively immune to external factors and can be predicted on the basis of asset structure alone (e.g., high quality non-callable bonds). The cash flows of other assets (e.g., callable bonds, mortgage-backed securities, common stocks, or premium receivables) are highly influenced by external events, and their analysis must be based on a combination of their structure and external factors. The actuary should consider the following issues in making cash flow projections:

- a. variation—the extent to which the expected cash flows vary due to changes in the scenarios;
- b. quality—the asset quality rating as it relates to the risk of delayed collectibility, default, or other financial nonperformance;
- c. associated costs—the costs of maintaining the assets or of converting the assets into cash;
- d. experience—the historical experience of similar assets, to the extent such experience is credible and relevant to the projection of future cash flows; and
- e. other factors—other factors that have a material effect on asset cash flows, particularly those factors that have an effect on asset risk or investment-rate-of-return risk.

5.4.2 Investment Strategy—The actuary should consider the insurer's strategy concerning asset management and the effect that this strategy will have on the projection of asset cash flows. Strategy considerations that might affect the projection include use of positive cash flows, funding of negative cash flows, policies and practices relative to the sale of assets prior to maturity and the disposal of assets with declining values, and receivable collection practices.

5.5 Projection of Obligation Cash Flows—In order to project an insurer's expected obligation cash flow, the actuary should consider the obligations' characteristics as well as the insurer's policies concerning the management of its obligations. The actuary should be satisfied that the model used to reflect these considerations produces reasonable estimates of expected obligation cash flows.

5.5.1 Obligation Characteristics—The characteristics of an obligation affect the timing and amounts of its cash flow items. The actuary should consider the following factors in the cash flow projection:

- a. variation—the extent to which the expected cash flows vary due to changes in the

scenarios;

- b. nonperformance risks—the risk of reinsurer insolvency or other nonperformance by reinsurers; if it is not practical to model these risks, they should be disclosed if the potential risks could be material;
- c. experience—the historical experience of similar obligations, to the extent such experience is credible and relevant to the projection of future cash flows; and
- d. other factors—other factors that have a material effect on obligation cash flows, particularly those factors that have an effect on asset risk, obligation risk, or investment-rate-of-return risk.

5.5.2 Management Policy—The actuary should consider management policy concerning the settlement or payment of obligations, and the effect that this policy will have on the projection of obligation cash flows. Considerations that might affect the projection include claim settlement and benefit payment practices, expense-control strategies, company philosophy relative to the determination of policyholder dividends and charges or benefits that vary at the discretion of the company, as well as any relationships between management policy and the scenarios.

5.6 Determination of Assumptions—No model can fully take into account all the uncertainties and interdependencies affecting an insurer's future cash flows. This implies the need to make simplifying assumptions in developing the specifications of a cash flow testing model.

5.6.1 Sensitivity Testing—The actuary should consider the sensitivity of the model to the effect of variations in key assumptions, and should be satisfied that the issue of sensitivity testing has been adequately addressed. In determining whether sensitivity testing has been adequately addressed, the actuary should consider the intended purpose and use of the testing and whether the results reflect a reasonable range of variation in the key assumptions, consistent with that intended purpose and use.

5.6.2 Internal Consistency—The actuary should analyze the assumptions with regard to the interrelationships between the scenarios and other assumptions to assure internal consistency.

5.6.3 External Requirements—The actuary should consider how laws, regulations, and other external requirements relating to such things as financial statements and operating ratios, federal income taxes, insurer capitalization, and distribution of an insurer's earnings to policyholders or shareholders may affect future cash flows or constrain the range of

possible scenarios. These factors should be appropriately reflected in the model.

- 5.7 Development of Conclusions—The cash flow test is the combination and analysis of the asset and obligation cash flow projections. This analysis may involve the discounting or accumulating of cash flows or a year-by-year comparison. Generally, cash flow projections are performed for a given time period. The actuary should consider the possible effect of cash flows beyond such a time period in analyzing results.

In developing conclusions, the actuary should be satisfied that the results of cash flow testing are reasonable. In determining whether the results are reasonable, the actuary should consider the intended purpose and use of the cash flow testing and the degree of uncertainty in the cash flow projections due to asset, obligation, and investment rate-of-return risks.

Any material limitations of the conclusions presented by the actuary should be described.

## Section 6. Communications and Disclosures

- 6.1 Reliance on Another—The actuary may not be qualified to measure the expected cash flows of all assets and obligations. In such instances, the actuary may make use of another person's work, or of other information provided by another person. The actuary should be guided by Interpretative Opinion 3(a)(4), "Reliance on Another," of the *Guides and Interpretative Opinions as to Professional Conduct* of the American Academy of Actuaries.
- 6.2 Actuarial Report—A written actuarial report is recommended as a means of documenting the assumptions, techniques, and conclusions reached when providing a professional recommendation or opinion.
- 6.3 Special Communications and Disclosures—The actuary's report relative to the results of the cash flow test should contain the following:
- a. specific identification of the insurer's obligations that are to be involved in the test and the assets that are to be dedicated to financing those obligations;
  - b. the scenario(s) used, the likelihood of the scenario(s), and the rationale behind the methodology used to develop the scenario(s);
  - c. description of the model used in the cash flow test, including the sources of the data and the key assumptions;
  - d. conclusions related to sensitivity testing; and



- e. disclosure of the source of or basis for any material assumption on which the actuary expresses no opinion as to appropriateness. The actuary should be guided by Interpretative Opinion 3(c)(1), “Conflict with Professional Judgment.”

6.4 Deviation from Standard—An actuary who uses a procedure which differs from this standard must include, in any actuarial communication disclosing the result of the procedure, an appropriate and explicit statement with respect to the nature, rationale, and effect of such use.