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**Actuarial Standard of  
Practice No. 4**

**Measuring Pension Obligations and  
Determining Pension Plan Costs or Contributions**

**Developed by the  
Pension Committee of the  
Actuarial Standards Board**

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**TO:** Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in Measuring Pension Obligations and Determining Pension Plan Costs or Contributions

**FROM:** Pension Committee of the Actuarial Standards Board (ASB)

**SUBJ:** Actuarial Standard of Practice (ASOP) No. 4

This document contains a discussion draft of potential language that could ultimately be included in a revision of ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*; the ASB Pension Committee is currently conducting a comprehensive review and revision of this standard. The purpose of this discussion draft is to share a portion of that work in order to collect input from interested parties as the work of the Pension Committee continues. Please note that since this is a work in progress, many changes and additions are likely.

The ASB has neither reviewed nor approved this discussion draft. This is not an exposure draft and there is no particular deadline for comments. However, the Pension Committee is proceeding apace on this project, so earlier comments are more likely to affect the contents of the eventual exposure draft. Interested parties will have an additional opportunity to comment once the formal exposure draft is issued.

The Pension Committee expects to create an exposure draft that will draw on the ideas in this discussion draft, modified by discussions with and comments received from interested parties and unfolding events. The Pension Committee also expects to address additional issues in the exposure draft that are not addressed in this discussion draft, as noted later in this memorandum. The exposure draft will go through the normal ASOP process:

1. The Pension Committee will submit the Exposure Draft (ED) to the ASB.
2. The ASB will revise the ED and release it to all actuaries and other interested parties for comment.
3. Following the end of the exposure period, the Pension Committee will revise the ED based on comments received and produce a proposed ASOP or a second ED (depending on the extent of changes). This document will follow the same process as the original ED (and even if submitted as a proposed ASOP may be changed to a second ED by the ASB).
4. The ASOP will become effective only after final approval by the ASB.

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Background

The Pension Committee is currently reviewing pension-related standards as well as working on a new standard regarding the assessment, disclosure and management of pension risk. The ASB intends to issue an exposure draft of ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, concurrently with the Pension Committee's issuance of this discussion draft of ASOP No. 4. Readers are encouraged to read the background section of the ASOP No. 27 exposure draft to learn the context in which to consider this discussion draft and to learn the breadth of the Pension Committee's work at this time. Readers may find the ASOP No. 27 exposure draft at [www.actuarialstandardsboard.org](http://www.actuarialstandardsboard.org).

Key Changes to ASOP No. 4 Included in the Discussion Draft

***Market-Consistent Measure***

The discussion draft includes a new section 2.12 defining a “market-consistent actuarial present value” based on risk-free discount rates. It also defines a new section 2.13 defining a “market-consistent actuarial present value of accrued benefits.”

The discussion draft does not address whether calculation or disclosure of a market-consistent measure should be required; however, the question of disclosure will be considered by the Pension Committee as part of its complete review and revision of ASOP No. 4. In addition, disclosure of a market-consistent measure will be considered by the Pension Committee in the context of its development of the proposed new standard covering the measurement and disclosure of risk.

There was considerable discussion within the Pension Committee regarding: the terminology used; whether to factor the credit-worthiness of the benefit promise into the discount rate; whether to incorporate the price of demographic uncertainty; the level of detail in defining the includible benefits; whether a broader spectrum of terms ought to be defined. Accordingly, the Pension Committee would appreciate comments on these issues.

***Expanded Definition of Cost or Contribution Allocation Procedure and Disclosure of Rationale for Changes***

Section 3.12 of the discussion draft expands the definition of a cost or contribution allocation procedure to include the asset valuation method. The result is a definition of cost or contribution allocation procedure that includes the actuarial cost method, the asset valuation method, and the amortization method.

The discussion draft introduces a new section 3.13 requiring the actuary to disclose any change in a cost or contribution allocation procedure in accordance with revised section 4.1(m). Section

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4.1(m) of the existing standard requires disclosure of a description of known changes in assumptions and methods. The revised language in the discussion draft adds that for assumption and method changes that are not prescribed, the actuary should include an explanation of the information and analysis that led to the change.

The revised language in section 4.1(m) also would require the actuary to disclose the reason for any change in cost or contribution allocation procedure (whether or not prescribed). In addition, if a change in asset valuation method is applied retroactively or as a result of an event subsequent to the measurement date, the actuary would have to so disclose. New section 3.13 also clarifies that changes to a cost or contribution allocation procedure include resetting the asset value.

The Pension Committee believes that these requirements would improve the communication of important information to end-users of the actuary's work product.

***Prescribed Assumptions and Methods***

The discussion draft revises the definition of prescribed assumption or method (section 2.16 in the current standard, sections 2.18 and 2.19 in the discussion draft). The discussion draft also changes the language in section 3.2 to refer to "prescribed assumption or method selected by another party," rather than the existing "prescribed assumption or method selected by the plan sponsor."

Section 2.19 was changed so that a "prescribed assumption or method selected by another party" now includes an assumption or method set by a federal, state or local government or governmental entity for a plan that it sponsors. As a result, such assumptions and methods would be subject to the evaluation and disclosure requirements of sections 3.2 and 4.2 of the standard. This change was made because the Committee did not see a conceptual difference between a private plan sponsor selecting a rate for its plan, a state government selecting a rate for its plan, or the federal government selecting a rate for its plan.

**Other Aspects of ASOP No. 4 under Review by the Pension Committee, but Not Included in this Discussion Draft**

The Pension Committee is reviewing many other aspects of ASOP 4, and expects to expose substantial additional material besides the three areas in this discussion draft. Areas under discussion include: whether additional criteria ought to apply to actuarial cost methods, amortization methods, and cost or contribution allocation procedures; whether certain terminology ought to be revised; whether standards are needed regarding the description and disclosure of funded status; whether projections of some sort ought to be required; whether additional guidance is warranted regarding the valuation of certain types of plan provisions, such as account-based plans and plan provisions with significant asymmetric risk (such as floor-offset provisions or the use of favorable investment returns to increase benefits); and the

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appropriateness of adjusting an investment return assumption when there is a significant difference between the market value of assets and a smoothed value of assets. Also, as noted, the Pension Committee is developing a proposed new standard on the assessment, disclosure, and management of risk.

Request for Comments

The Pension Committee appreciates comments on the proposed changes and would like to draw the readers' attention to the following areas in particular:

1. Is the approach taken to market-consistent measure clear, sufficient, and appropriate? If not, what approach should be taken?
2. Are the expanded definitions and disclosures of cost or contribution allocation procedure clear, sufficient, and appropriate? If not, how should they be changed?
3. Are the revised definitions regarding prescribed assumptions and methods, and the resulting disclosure obligations, clear, sufficient, and appropriate? If not, how should they be changed?

Please review this discussion draft and give the Pension Committee the benefit of your comments and suggestions. Although comments may not receive individual responses, they all will receive appropriate consideration by the drafting committee in preparing the exposure draft for approval by the ASB. Comments can be sent to [discussion@actuary.org](mailto:discussion@actuary.org). We suggest comments be sent by April 30, 2011.

If you wish to use conventional mail, please send comments to the following address:

ASOP No. 4 Revision – Discussion Draft  
Actuarial Standards Board  
1850 M Street, Suite 300  
Washington, DC 20036

At this time, comments on the discussion draft received by the Pension Committee will not be shared with the ASB but may be used by the Pension Committee as input. Also, note that the discussion draft may undergo substantial change as it is being developed, at the sole discretion of the Pension Committee.

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**MEASURING PENSION OBLIGATIONS**  
**AND DETERMINING PENSION PLAN COSTS OR CONTRIBUTIONS**

**STANDARD OF PRACTICE**

Section 1. Purpose, Scope, Cross References, and Effective Date

- 1.1 Purpose—This actuarial standard of practice (ASOP) provides guidance to actuaries when performing professional services with respect to measuring pension obligations and determining plan costs or contributions. Throughout this standard, the term *plan* refers to a defined benefit pension plan. Other actuarial standards of practice address actuarial assumptions and asset valuation methods. This standard addresses actuarial cost methods and provides guidance for coordinating and integrating all of these elements of an actuarial valuation of a plan.
- 1.2 Scope—This standard applies to actuaries when performing professional services with respect to the following tasks:
- a. measurement of pension obligations. Examples include determinations of funded status, assessments of solvency upon plan termination, and measurements for use in cost or contribution determinations;
  - b. assignment of the value of plan obligations to time periods. Examples include contributions, accounting costs, and cost or contribution estimates for potential plan changes;
  - c. development of a cost allocation procedure used to determine costs for a plan;
  - d. development of a contribution allocation procedure used to determine contributions for a plan;
  - e. determination as to the types and levels of benefits supportable by specified cost or contribution levels; and
  - f. projection of pension obligations, plan costs or contributions, and other related measurements. Examples include cash flow projections and projections of a plan's funded status.

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Throughout this standard, any reference to selecting actuarial assumptions, actuarial cost methods, asset valuation methods, and amortization methods also includes giving advice on selecting actuarial assumptions, actuarial cost methods, asset valuation methods, and amortization methods. In addition, any reference to developing or modifying a cost or contribution allocation procedure includes giving advice on developing or modifying a cost or contribution allocation procedure.

If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority) or for any other reason the actuary deems appropriate, the actuary should refer to section 4.3.

This standard does not apply to actuaries when performing professional services with respect to individual benefit calculations, individual benefit statement estimates, annuity pricing, nondiscrimination testing, and social insurance programs as described in section 1.2, Scope, of ASOP No. 32, *Social Insurance* (unless an ASOP on social insurance explicitly calls for application of this standard).

This standard does not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make contributions to the plan when due.

- 1.3 Cross References—When this standard refers to the provisions of other documents, the reference includes the referenced documents as they may be amended or restated in the future, and any successor to them, by whatever name called. If any amended or restated document differs materially from the originally referenced document, the actuary should consider the guidance in this standard to the extent it is applicable and appropriate.
- 1.4 Effective Date—This standard will be effective for any actuarial work product covered by this standard's scope produced on or after four months after adoption by the Actuarial Standards Board (ASB).

Section 2. Definitions

The terms below are defined for use in this actuarial standard of practice.

- 2.1 Actuarial Accrued Liability—The portion of the actuarial present value of projected benefits (and expenses, if applicable), as determined under a particular actuarial cost method, which is not provided for by future normal costs. Under certain actuarial cost methods, the actuarial accrued liability is dependent upon the actuarial value of assets.
- 2.2 Actuarial Cost Method—A procedure for allocating the actuarial present value of projected benefits (and expenses, if applicable) to time periods, usually in the form of a

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- normal cost and an actuarial accrued liability (sometimes referred to as a *funding method*).
- 2.3 Actuarial Present Value—The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of actuarial assumptions.
- 2.4 Actuarial Present Value of Projected Benefits—The actuarial present value of benefits that are expected to be paid in the future, taking into account the effect of such items as future service, advancement in age, and anticipated future compensation (sometimes referred to as the *present value of future benefits*).
- 2.5 Actuarial Valuation—The measurement of relevant pension obligations and, when applicable, the determination of periodic costs or contributions.
- 2.6 Amortization Method—A method under a contribution or cost allocation procedure for determining the amount, timing, and pattern of recognition of the difference between the actuarial accrued liability and the actuarial value of assets.
- 2.7 Contribution—A potential payment to the plan determined by the actuary. It may or may not be the amount actually paid by the plan sponsor or other contributing entity.
- 2.8 Contribution Allocation Procedure—A procedure for determining the periodic contribution for a plan. It may produce a single value, such as normal cost plus twenty-year amortization of the unfunded actuarial accrued liability, or a range of values, such as that from the ERISA minimum required contribution to the maximum tax-deductible amount.
- 2.9 Cost—The portion of plan obligations assigned to a period for purposes other than funding.
- 2.10 Cost Allocation Procedure—A procedure for determining the periodic cost for a plan (for example, the procedure to determine the net periodic pension cost under Statement of Financial Accounting Standards (SFAS) No. 87, *Employers' Accounting for Pensions*).
- 2.11 Expenses—Administrative or investment expenses expected to be borne by the plan.
- 2.12 Market-Consistent Actuarial Present Value—An actuarial present value measurement in which benefits that are expected to be paid in the future are discounted using a market-consistent set of discount rates. A market-consistent set of discount rates is based on market yields for a hypothetical risk-free bond portfolio whose cash flows reasonably match the pattern of benefits that are expected to be paid in the future. In determining this present value, benefits that are expected to be paid in the future incorporate economic

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assumptions that are consistent with the market-consistent set of discount rates. Further, expected benefit payments do not reflect the risk of non-payment, except for demographic contingencies.

- 2.13 Market-Consistent Actuarial Present Value of Accrued Benefits—The market-consistent actuarial present value of accrued benefits that are expected to be paid in the future. For the purpose of this present value measurement, accrued benefits include vested and nonvested benefits, and take into account the following items (if applicable to the plan benefits) as of the measurement date:
- a. accrued service;
  - b. compensation;
  - c. substantive plan provisions, i.e., the plan as it is commonly understood by the plan sponsor and participants, reflecting current benefit administration practice;
  - d. ancillary benefits, such as disability benefits or death benefits; and
  - e. automatic cost-of-living adjustments.

Ancillary benefits and early retirement subsidies are deemed to accrue on a pro rata basis over total service. Any benefit that is not based on service is deemed to accrue on a pro rata basis over total service. Benefits that are disproportionately backloaded relative to service are deemed to accrue on a pro rata basis over total service.

- 2.14 Measurement Date—The date as of which the values of the pension obligations and, if applicable, assets are determined (sometimes referred to as the *valuation date*).
- 2.15 Normal Cost—The portion of the actuarial present value of projected benefits (and expenses, if applicable) that is allocated to a period, typically twelve months, under the actuarial cost method. Under certain actuarial cost methods, the normal cost is dependent upon the actuarial value of assets.
- 2.16 Participant—An individual who satisfies the requirements for participation in the plan.
- 2.17 Plan Provisions—(a) Relevant terms of the plan document; and (b) relevant administrative practices known to the actuary.
- 2.18 Prescribed Assumption or Method by Law—A specific assumption or method that is mandated or that is selected from a specified range or set of assumptions or methods that is deemed to be acceptable by applicable law (statutes, regulations, or other legally binding authority).

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- 2.19 Prescribed Assumption or Method Selected by Another Party—A specific assumption or method that is selected by another party, to the extent that laws, regulations, or accounting standards give the other party responsibility for selecting such an assumption or method. For this purpose, and notwithstanding section 2.18, an assumption or method set by a federal, state or local government, government agency, or other governmental entity for a plan that such governmental entity directly or indirectly sponsors, is deemed to be a prescribed assumption or method selected by another party.

Section 3. Analysis of Issues and Recommended Practices

- 3.1 Overview—Measuring pension obligations and determining plan costs or contributions are processes in which the actuary may be required to make judgments or recommendations on the choice of actuarial assumptions, actuarial cost methods, asset valuation methods, and amortization methods.

The actuary may have the responsibility and authority to select some or all actuarial assumptions, actuarial cost methods, asset valuation methods, and amortization methods. In other circumstances, the actuary may be asked to advise the individuals who have that responsibility and authority. In yet other circumstances, the actuary may perform actuarial calculations using assumptions or methods prescribed by applicable law or selected by others.

ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, and ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, provide guidance concerning actuarial assumptions. ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*, provides guidance concerning asset valuation methods. ASOP No. 4 addresses actuarial cost methods and provides guidance for coordinating and integrating all of these elements of an actuarial valuation of a plan. In the event of a conflict between the guidance provided in ASOP No. 4 and the guidance in any of the aforementioned ASOPs, ASOP No. 4 would govern.

- 3.2 Prescribed Assumption or Method Selected by Another Party—The actuary should evaluate whether a prescribed assumption or method selected by another party (as defined in section 2.19) is reasonable for the purpose of the measurement, except as provided in section 3.2.2. The actuary should be guided by Precept 8 of the *Code of Professional Conduct*, which states, “An Actuary who performs Actuarial Services shall take reasonable steps to ensure that such services are not used to mislead other parties.” For purposes of this evaluation, reasonable assumptions or methods are not necessarily limited to those the actuary would have selected for the measurement.

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- 3.2.1 Evaluating Prescribed Assumption or Method—When evaluating a prescribed assumption or method selected by another party, the actuary should consider whether the prescribed assumption or method significantly conflicts with what, in the actuary’s professional judgment, would be reasonable for the purpose of the measurement. If, in the actuary’s professional judgment, there is a significant conflict, the actuary should disclose this conflict in accordance with section 4.2(a).
- 3.2.2 Inability to Evaluate Prescribed Assumption or Method—If the actuary is unable to evaluate a prescribed assumption or method selected by another party without performing a substantial amount of additional work beyond the scope of the assignment, the actuary should disclose this in accordance with section 4.2(b).
- 3.3 General Procedures—When measuring pension obligations and determining plan costs or contributions, the actuary should perform the following:
- a. identify the purpose and nature of the measurement;
  - b. identify the measurement date (section 3.4);
  - c. identify plan provisions applicable to the measurement (section 3.5);
  - d. gather data necessary for the measurement (section 3.6);
  - e. select actuarial assumptions pertinent to the measurement, if applicable (section 3.7);
  - f. select an asset valuation method, if applicable (section 3.8);
  - g. consider the interrelationship among procedures, assumptions, and plan provisions (section 3.9);
  - h. consider the relationship between procedures used for measuring assets and obligations (section 3.10);
  - i. apply an actuarial cost method to produce a normal cost and actuarial accrued liability, if applicable (section 3.11);
  - j. apply a procedure to allocate costs or contributions to past and future periods, if applicable (section 3.12); and

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- k. consider whether the actuarial cost method and amortization method are significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due, if applicable (section 3.14).
- 3.4 Measurement Date Considerations—When measuring pension obligations and determining plan costs or contributions as of a measurement date, the actuary should consider the following:
- 3.4.1 Information as of a Different Date—The actuary may estimate asset and participant information at the measurement date on the basis of information furnished as of another date. In these circumstances, the actuary should make appropriate adjustments to the data. Alternatively, the actuary may calculate the obligations on the date as of which the data were furnished and then adjust the obligations to the measurement date (see section 3.17 for additional guidance). The actuary should conclude that any such adjustments are reasonable in the actuary’s professional judgment, given the purpose and nature of the measurement.
  - 3.4.2 Events after the Measurement Date—The treatment of events known to the actuary that occur subsequent to the measurement date and prior to the date of the actuarial communication should be appropriate for the purpose of the measurement. Unless the purpose of the measurement requires the inclusion of such events, they need not be reflected in the measurement.
- 3.5 Plan Provisions—When measuring pension obligations and determining plan costs or contributions, the actuary should take into account plan provisions as appropriate for the purpose and nature of the measurement.
- 3.5.1 Adopted Plan Changes—The actuary should take into account adopted plan provisions consistent with the following when determining costs or contributions for a period, unless contrary to applicable law:
    - a. Provisions adopted on or before the measurement date should be reflected for at least the portion of the period during which the provisions are in effect.
    - b. Provisions adopted after the measurement date may, but need not, be reflected.
  - 3.5.2 Proposed Plan Changes—The actuary should reflect proposed plan changes as appropriate for the purpose and nature of the measurement.

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- 3.6 Data—With respect to the data used for measurements, including data supplied by others, the actuary should refer to ASOP No. 23, *Data Quality*, for guidance. In addition, the actuary should consider the following:
- 3.6.1 Participants—The actuary should include in the measurement all participants reported to the actuary, except in appropriate circumstances where the actuary may exclude persons such as those below a minimum age/service level. When appropriate, the actuary may include employees who might become participants in the future.
- 3.6.2 Hypothetical Data—When appropriate, the actuary may prepare measurements based on the assumed demographic characteristics of individuals not yet in covered employment.
- 3.7 Actuarial Assumptions—With respect to the selection of actuarial assumptions, the actuary should also refer to ASOP Nos. 27 and 35 for guidance.
- 3.8 Asset Valuation—The actuary should also refer to ASOP No. 44 for guidance on the selection and use of an asset valuation method.
- 3.9 Interrelationship Among Procedures, Assumptions, and Plan Provisions—Some plan provisions may create pension obligations that are difficult to measure using deterministic procedures and assumptions selected in accordance with ASOP Nos. 27 and 35. In such circumstances, the actuary may consider using alternative procedures, such as stochastic modeling or option-pricing techniques, or alternative assumptions that include adjustments to reflect the plan provisions that were not explicitly valued.

If, in the actuary's professional judgment, such plan provisions are significant and have not been reflected in the measurement, the actuary should so disclose in accordance with section 4.1(d).

An example of such a plan provision is one that provides future benefits based on the actual experience of the plan that will vary asymmetrically relative to the estimated projected benefits based on a particular set of actuarial assumptions, such as the following:

- a. the use of favorable investment returns to provide cost-of-living increases automatically to retirees; or
- b. floor-offset provisions that provide a minimum defined benefit in the event a participant's account balance in a separate plan falls below some threshold.



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3.10 Relationship Between Procedures Used for Measuring Assets and Obligations—The actuary should measure assets and obligations on a consistent basis as of the measurement date. Following are some examples of such consistency:

- a. if a participant was due a lump sum before the measurement date, but such lump sum had not been paid from plan assets as of the measurement date, the actuary should either include the participant's benefit due in obligations, or exclude it from the asset value, used in the measurement;
- b. if a plan has a dedicated portfolio of non-callable bonds specifically designed so that emerging interest and principal payments meet specific emerging benefit payments, the actuary could value the bond portfolio at market value and value the specific emerging benefit payments using an interest rate equal to the internal rate of return of the bonds on a market value basis. Alternatively, the actuary could determine a composite valuation interest rate that reflects a weighted average of the internal rate of return of the bonds on a market value basis and the expected return on the remainder of the assets; and
- c. if the actuary values bonds at amortized cost, as permitted under ASOP No. 44 when the plan's investment policy provides that such bonds are expected to be held to maturity and holding such bonds to maturity is not inconsistent with the plan's investment practice and expected cash flow needs, the actuary could value an appropriate portion of the pension obligation using an interest rate equal to the internal rate of return of the bonds on an amortized cost basis. Alternatively, the actuary could determine a composite valuation interest rate that reflects a weighted average of the internal rate of return of the bonds on an amortized cost basis and the expected return on the remainder of the assets.

3.11 Actuarial Cost Method—When assigning costs or contributions to time periods in advance of the time benefit payments are due, the actuary should select an actuarial cost method that meets the following criteria:

- a. The period over which normal costs are allocated for a participant should begin no earlier than the date of employment and should not extend beyond the last assumed retirement age. The period may be applied to each individual participant or to groups of participants on an aggregate basis.

When a plan has no active participants and no participants are accruing benefits, a reasonable actuarial cost method will not produce a normal cost for benefits. For purposes of this standard, an employee does not cease to be an active participant merely because he or she is no longer accruing benefits under the plan.

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- b. The attribution of normal costs should bear a reasonable relationship to some element of the plan's benefit formula or the participants' compensation or service. The attribution basis may be applied on an individual or group basis (for example, the actuarial present value of projected benefits for each participant may be allocated by that participant's own compensation or may be allocated by the aggregated compensation for a group of participants).
  - c. Expenses should be considered when assigning costs or contributions to time periods. For example, the expenses for a period may be added to the normal cost for benefits or expenses may be reflected as an adjustment to the investment return assumption or the discount rate. As another example, expenses may be reflected as a percentage of pension obligation or normal cost.
  - d. The sum of the actuarial accrued liability and the actuarial present value of future normal costs should equal the actuarial present value of projected benefits and expenses, to the extent expenses are included in the liability and normal cost. For purposes of this criterion, under an actuarial cost method that does not directly calculate an actuarial accrued liability, the sum of the actuarial value of assets and the unfunded actuarial liability, if any, shall be considered to be the actuarial accrued liability.
- 3.12 Cost or Contribution Allocation Procedure—The cost or contribution allocation procedure typically combines an actuarial cost method, an asset valuation method, and an amortization method to determine the cost or contribution for the period. When selecting a cost or contribution allocation procedure, the actuary should consider factors such as the timing and duration of expected benefit payments and the nature and frequency of plan amendments. In addition, the actuary should consider relevant input received from the principal, such as a desire for stable or predictable costs or contributions, or a desire to achieve a target funding level within a specified time frame.
- 3.13 Changes to Cost or Contribution Allocation Procedure—Changes to a cost or contribution allocation procedure include changes to the actuarial cost method, changes to the asset valuation method (including resetting the asset value), and changes to the amortization method. When a cost or contribution allocation procedure is changed, the actuary should make the disclosures described in section 4.1(m).
- 3.14 Consistency Between Contribution Allocation Procedure and the Payment of Benefits—In some circumstances, a contribution allocation procedure selected in accordance with section 3.12 may not necessarily produce adequate assets to make benefit payments when they are due even if the actuary uses a combination of assumptions selected in accordance with ASOP Nos. 27 and 35, an actuarial cost method selected in accordance with section 3.11 of this standard, and an asset valuation method selected in accordance with ASOP No. 44.

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Examples of such circumstances include the following:

- a. a plan covering a sole proprietor with funding that continues past an expected retirement date with payment due in a lump sum;
- b. using the aggregate funding method for a plan covering three employees, in which the principal is near retirement and the other employees are relatively young; and
- c. a plan amendment with an amortization period so long that overall plan contributions would be scheduled to occur too late to make plan benefit payments when due.

3.14.1 Actuary Selects Actuarial Cost Method or Amortization Method—When performing professional services with respect to contributions for a plan, the actuary should not select an actuarial cost method or amortization method that, in the actuary’s professional judgment, is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming that all actuarial assumptions will be realized and that the plan sponsor or other contributing entity will make contributions when due.

3.14.2 Actuary Does Not Select Actuarial Cost Method or Amortization Method—In some circumstances, the actuary’s role is to determine the contribution, or range of contributions, using an actuarial cost method or amortization method prescribed by applicable law or selected by others. If, in the actuary’s professional judgment, such an actuarial cost method or amortization method is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming that all actuarial assumptions will be realized and that the plan sponsor or other contributing entity will make contributions when due, the actuary should disclose this in accordance with section 4.1(j).

This standard does not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make contributions to the plan when due.

3.15 Measuring the Value of Accrued or Vested Benefits—Depending on the scope of the assignment, the actuary may measure the value of accrued or vested benefits as of a measurement date. The actuary should consider the following when making such measurements:

- a. relevant plan provisions and applicable law;
- b. the status of the plan (for example, whether the plan is assumed to continue to exist or be terminated);

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- c. the contingencies upon which benefits become payable, which may differ for ongoing- and termination-basis measurements;
  - d. the extent to which participants have satisfied relevant eligibility requirements for accrued or vested benefits and the extent to which future service or advancement in age may satisfy those requirements;
  - e. whether or the extent to which death, disability, or other ancillary benefits are accrued or vested;
  - f. whether the plan provisions regarding accrued benefits provide an appropriate attribution pattern for the purpose of the measurement (for example, it may not be appropriate if the plan's benefit accruals are severely backloaded); and
  - g. if the measurement reflects the impact of a special event (such as a plant shutdown or plan termination), the actuary should consider factors such as the following:
    - 1. the effect of the special event on continued employment;
    - 2. the impact of the special event on employee behavior due to factors such as subsidized payment options;
    - 3. expenses associated with a potential plan termination, including transaction costs to liquidate plan assets; and
    - 4. changes in investment policy.
- 3.16 Volatility—If the scope of the actuary's assignment includes an analysis of the potential range of future pension obligations, costs, contributions, or funded status, the actuary should consider sources of volatility that, in the actuary's professional judgment, are significant. Examples of potential sources of volatility include the following:
- a. plan experience differing from that anticipated by the economic or demographic assumptions, as well as the effect of new entrants;
  - b. changes in economic or demographic assumptions;
  - c. the effect of discontinuities in applicable cost or funding regulations, such as full funding limitations, the end of amortization periods, or liability recognition triggers;

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- d. the delayed effect of smoothing techniques, such as the pending recognition of prior experience losses; and
- e. patterns of rising or falling cost expected when using a particular actuarial cost method for the plan population.

In analyzing potential variations in economic and demographic experience or assumptions, the actuary should exercise professional judgment in selecting a range of variation in these factors and in selecting a methodology by which to analyze them, consistent with the scope of the assignment.

3.17 Adjustment of Prior Measurement—The actuary may adjust the results from a prior measurement in lieu of performing a new detailed measurement if, in the actuary’s professional judgment, such an adjustment would produce an appropriate result for purposes of the measurement. To determine whether adjustment is appropriate, the actuary should consider items such as the following, if known to the actuary:

- a. changes in the number of participants or the demographic characteristics of that group;
- b. length of time since the prior measurement;
- c. differences between actual and expected contributions, benefit payments, expenses, and investment performance; and
- d. changes in economic and demographic expectations.

For example, when adjusting obligations from a prior measurement date, the actuary should consider whether the interest rate or other assumptions used to determine the obligations should be revised.

3.18 Approximations and Estimates—The actuary should use professional judgment to establish a balance between the degree of refinement of methodology and materiality. The actuary may use approximations and estimates where circumstances warrant. Following are some examples of such circumstances:

- a. situations in which the actuary reasonably expects the results to be substantially the same as the results of detailed calculations;
- b. situations in which the actuary’s assignment requires informal or rough estimates; and

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- c. situations in which the actuary reasonably expects the benefits being valued to represent only a minor part of the overall pension obligation, cost, or contribution.
- 3.19 Reliance on Data, Plan Provisions, or Other Information Supplied by Others—When relying on data, plan provisions, or other information supplied by others, the actuary should refer to ASOP No. 23 for guidance.
- 3.20 Documentation—The actuary should prepare and retain documentation in compliance with the requirements of ASOP No. 41, *Actuarial Communications*. The actuary should also prepare and retain documentation to demonstrate compliance with the disclosure requirements of section 4.1.

Section 4. Communications and Disclosures

- 4.1 Communication Requirements—Any actuarial communication prepared to communicate the results of work subject to this standard must comply with the requirements of ASOP Nos. 23, 27, 35, 41, and 44. In addition, such communication should contain the following elements, where relevant and material:
- a. a statement of the intended purpose of the measurement and a statement to the effect that the measurement may not be applicable for other purposes;
  - b. the measurement date;
  - c. a description of adjustments made for events after the measurement date under section 3.4.2;
  - d. an outline or summary of the benefits included in the actuarial valuation and of any significant benefits not included in the actuarial valuation;
  - e. the date(s) as of which the participant and financial information were compiled;
  - f. a summary of the participant information;
  - g. if hypothetical data are used, a description of the data;
  - h. a description of the actuarial cost method and the manner in which normal costs are allocated, in sufficient detail to permit another actuary qualified in the same practice area to assess the material characteristics of the method (for example, how the actuarial cost method is applied to multiple benefit formulas, compound benefit formulas, or benefit formula changes, where such plan provisions are significant);

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- i. a description of the cost or contribution allocation procedure, including a description of amortization methods and any pay-as-you-go component (i.e., the intended payment by the plan sponsor of some or all benefits when due);
- j. if applicable in accordance with section 3.14.2, a statement indicating that the actuarial cost method or amortization method is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due;
- k. if the actuary measured the value of accrued or vested benefits, a description of the types of benefits regarded as vested and accrued and, to the extent the attribution pattern of accrued benefits differs from or is not described by the plan provisions, a description of the attribution pattern;
- l. a statement, appropriate for the intended audience (as defined in ASOP No. 41), indicating that future measurements (for example, of pension obligations, costs, contributions, or funded status as applicable) may differ significantly from the current measurement. For example, a statement such as the following could be applicable: “Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan’s funded status); and changes in plan provisions or applicable law.”

In addition, the actuarial communication should include one of the following:

- 1. if the scope of the actuary’s assignment included an analysis of the range of such future measurements, disclosure of the results of such analysis together with a description of the factors considered in determining such range; or
  - 2. a statement indicating that, due to the limited scope of the actuary’s assignment, the actuary did not perform an analysis of the potential range of such future measurements;
- m. a description of known changes in assumptions and methods from those used in the immediately preceding measurement prepared for a similar purpose. For assumption and method changes that are not prescribed, the actuary should include an explanation of the information and analysis that led to those changes. For all changes in cost or contribution allocation procedures described in section

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3.13, the actuary should disclose the reason for the change; the general effects of the change on relevant cost, contribution, funded status, or other measures, by words or numerical data, as appropriate; and, whether any change in asset valuation method is applied retroactively or as a result of an event subsequent to the measurement date;

- n. a description of adjustments of prior measurements used under section 3.17; and
- o. if, in the actuary's professional judgment, the actuary's use of approximations or estimates could result in a significant margin for error relative to the results if a detailed calculation had been done, a statement to this effect.

An actuarial communication can comply with some, or all, of the specific requirements of this section by making reference to information contained in other actuarial communications available to the intended audience (as defined in ASOP No. 41), such as an annual actuarial valuation report.

- 4.2 Disclosure about Prescribed Assumptions or Methods—The actuary's communication should state the source of any prescribed assumptions or methods. In addition, with respect to prescribed assumptions or methods selected by another party, the actuary's communication should identify the following, if applicable:
  - a. any prescribed assumption or method that significantly conflicts with what, in the actuary's professional judgment, would be reasonable for the purpose of the measurement (section 3.2.1); or
  - b. any prescribed assumption or method that the actuary is unable to evaluate for reasonableness for the purpose of the measurement (section 3.2.2).
- 4.3 Deviation from the Guidance of an ASOP—If, in the actuary's professional judgment, the actuary has deviated materially from the guidance set forth in an applicable ASOP, other than as covered under sections 4.2 or 4.3 of ASOP No. 41, the actuary can still comply with that ASOP by providing an appropriate statement in the actuarial communication with respect to the nature, rationale, and effect of such deviation.



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**Appendix 1**

**Background and Current Practices**

*Note:* This appendix is provided for informational purposes, but is not part of the standard of practice.

Background

Actuarial standard of practice (ASOP) No. 4, *Recommendations for Measuring Pension Obligations*, was first adopted by the Interim Actuarial Standards Board in January 1988. This standard superseded *Pension Plan Recommendations A, B, and C*, which the American Academy of Actuaries adopted in the period 1976 to 1983. The Interpretations of those Recommendations were incorporated as appendices in the standard. The ASB adopted a reformatted version of ASOP No. 4, renamed *Measuring Pension Obligations* and incorporating several clarifying revisions, in October 1993 (prior ASOP No. 4).

Since the prior ASOP No. 4 was adopted, the ASB has adopted the following standards that provide more detailed guidance regarding specific elements of the process of measuring pension obligations:

1. ASOP No. 23, *Data Quality*;
2. ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*;
3. ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*;
4. ASOP No. 41, *Actuarial Communications*; and
5. ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*.

The prior ASOP No. 4 contained general recommendations for selecting economic and noneconomic assumptions, actuarial cost methods, and asset valuation method—all key elements in the measurement of pension obligations. The ASB decided to revise ASOP No. 4 to create an “umbrella” standard to tie together these existing and proposed standards and address overall considerations for the actuary when measuring pension obligations. In addition, because the prior ASOP No. 4 and this revision cover the determination of plan costs or contributions, the name of the standard was changed to *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*.

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Because the prior ASOP No. 4 contained guidance that is now covered in other standards, ASOP No. 4 has been revised to remove any guidance that is now contained in those standards and to add references to those standards. Some of the material in the prior ASOP No. 4 was educational rather than guidance on actuarial practice and consequently was not included in this revised standard.

The revision of ASOP No. 4 has been written to reflect that at times the actuary may have the responsibility and authority to select actuarial assumptions, actuarial cost methods, asset valuation methods, and amortization methods, but in other circumstances the actuary may only advise, or may not even have an opportunity to advise, the individuals who have that responsibility and authority. For instance, the actuary may advise the plan administrator or plan sponsor on selecting an actuarial cost method for purposes of determining minimum funding requirements under ERISA, but the plan administrator or plan sponsor is ultimately responsible for selecting the method.

Current Practices

This standard and the related standards listed above cover actuarial practices that are central to the work regularly performed by actuaries in the pension field. The actuarial tasks covered by the standards are performed for a number of purposes, examples of which are discussed below:

1. Cost, Contribution, and Benefit Recommendations—Calculations may be performed for purposes of determining actuarial cost, contribution, and benefit recommendations and related information. Examples are calculations related to the following:
  - a. recommendations as to the assignment of costs or contributions to time periods for defined benefit plans;
  - b. recommendations as to the type and levels of benefits for specified cost or contribution levels;
  - c. contributions required under minimum funding standards imposed by statute or regulations;
  - d. maximum contributions deductible for tax purposes;
  - e. information required with respect to plan design; and
  - f. determination of progress towards a defined financial goal, such as funding of vested or accrued benefits.

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2. Evaluations of Current Funding Status—Calculations may be performed for purposes of comparing available assets to the actuarial present value of benefits specified by the plan. Examples are calculations related to the following:
  - a. actuarial present value of accrued benefits;
  - b. actuarial present value of vested benefits;
  - c. actuarial present value of benefits payable in the event of plan termination; and
  - d. information required with respect to plan mergers, acquisitions, spin-offs, and business discontinuances.
3. Comparison of Actuarial Present Values—Calculations may be performed to compare the actuarial present values of different pension obligations, such as optional benefit forms or commencement dates.