



ACTUARIAL STANDARDS BOARD

**Actuarial Standard
of Practice
No. 4**

Measuring Pension Obligations

**Reformatted by the
Pension Committee of the
Actuarial Standards Board
1993**

**Approved for Publication by the
Actuarial Standards Board
October 1993**

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October 1993

TO: Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in Actuarial Calculations for Pension Plans

FROM: Actuarial Standards Board (ASB)

SUBJ: Reformatted Actuarial Standard of Practice No. 4: *Measuring Pension Obligations*

Background

In July 1987, the Interim Actuarial Standards Board (IASB) issued an exposure draft titled *Recommendations for Measuring Pension Obligations*. A total of seventeen letters of response were received. Those comments were considered by the Pension Committee of the IASB; the document was revised to reflect them and was adopted by the IASB in January 1988. It represents a basic set of recommended practices for pension actuaries and those using their services.

The 1988 standard superseded Pension Plan Recommendations A, B, and C of the American Academy of Actuaries as “generally accepted pension actuarial principles and practices.” Interpretations 1, 2, and 3 of the prior Recommendations became Interpretations of the new standard.

Reformatting

The standard has subsequently been reformatted in the uniform format adopted by the Actuarial Standards Board (ASB), successor to the IASB. The former Interpretations have become Illustrations in Appendix I of this standard.

The reformatted version of the standard contains almost identically the content of the prior version. However, some paragraphs have been relocated, some retitled, and virtually all have been renumbered.

In addition, some editorial changes were made to make the standard more up-to-date. For example, a paragraph was added to (new) subsection 1.2 to refer to the fact that the Code of Professional Conduct adopted by each of the actuarial organizations whose members are bound by actuarial standards of practice provides that laws and regulations prevail when they conflict with the standards. The wording in subsection 5.2.4(b) was rearranged to conform with current law and practice. New wording was placed in subsection 6.2.3(g) to clarify the language concerning disclosure of expected changes in future costs.

The ASB had originally intended to incorporate additional guidance in this reformatting of the standard to deal with disclosures by the actuary relating to the possibility of changes in benefit values because of plant shutdown provisions and plan terminations. The board issued two exposure drafts and held a public hearing on proposed content and wording for such guidance. The ASB and its Pension Committee have weighed the comments, both oral and written, that were received in this exposure and hearing process, and have determined that there is a lack of consensus as to the extent and nature of such additional disclosure requirements.

Subsequently, it was brought to the attention of the board that there may be other kinds of extraordinary events that should also be addressed by the actuary as part of the process of measuring pension obligations; if so, any special disclosure requirements should be developed so as to apply in a consistent manner to all such extraordinary events. Accordingly, the ASB decided at its July 1993 meeting to undertake development of a separate standard that would address the broadened concept of the actuary's responsibilities and disclosure requirements relating to the possibilities of changes in benefit values as a result of such extraordinary events.

An introductory paragraph was inserted at the beginning of (new) section 5 to say that detailed guidance in certain areas would be forthcoming in separate standards under development. These will contain more detailed guidance on a number of aspects of this standard. As each of the more detailed standards is adopted, its guidance will supersede guidance contained in this standard if there is a conflict. When all the more detailed standards have been adopted, this standard will be revised and will serve as a master document.

Comments on the 1987 Exposure Draft and Committee's Responses in 1988

The committee's responses to the comments have been highlighted in **boldface** for ease of identification.

There were several comments to the effect that certain of the requirements of the exposure draft might not be appropriate for a particular purpose which fell within the scope of the document. **The draft was modified accordingly.**

A number of comments related to the requirements of subsection 5.2.4(b) (old paragraph 7.3) regarding the selection of assumptions, particularly with respect to small plans. **The subsection was rewritten to better address these concerns.**

In the appendix on terminology, the Pension Committee of the IASB combined and clarified Items A-7 and A-8 of the exposure draft with respect to frozen actuarial accrued liability.

Comments were raised as to the general acceptability of projection or forecast actuarial cost methods. **The committee decided that such methods are acceptable, provided, as always, that the actuarial assumptions and other components of the calculation are appropriate. Subsection 5.2.5(c) (old paragraph 8.4) was expanded for clarity.**

One commentator in 1987 questioned the omission of any discussion of materiality. **The committee recognized that materiality is a consideration for most pension actuarial calculations. Lack of materiality may be a legitimate reason for not following the standard. However, that is not the same as saying that the standard has been followed. Thus the committee decided that a discussion of materiality was not appropriate within the text of the standard.**

There were a number of comments drawing attention to the fact that funding levels are generally beyond the actuary's control, and suggesting that the standard reflect this. **The committee believed that the actuary's role must include a responsibility to the beneficiaries of the plan vis-a-vis the security of their benefits. Thus the section on the actuary's responsibility continues to highlight this obligation.**

The committee also received comments that in some cases the recommended practices in this standard were inconsistent with standards of other standard-setting bodies. **This standard sets forth generally accepted actuarial practices. It is not an intended purpose of this standard to certify or reconcile standards made by others or fulfill a specified purpose (taxes, accounting, etc.). When an actuary is required to prepare calculations in compliance with another standard, subsection 6.4 (old paragraph 1.3) of this standard requires explicit disclosure of exceptions to this standard.**

The standard was prepared by the Pension Committee of the IASB, and reformatted by the Pension Committee of the ASB. The ASB has examined the reformatted standard and approved it for publication.

Pension Committee of the IASB (1987)

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**ACTUARIAL STANDARD OF PRACTICE NO. 4
(1993 Reformatted Edition)**

MEASURING PENSION OBLIGATIONS

PREAMBLE

Section 1. Purpose, Scope, and Effective Date

- 1.1 Purpose—This standard sets forth generally accepted actuarial principles and practices for measuring pension obligations.
- 1.2 Scope—This standard applies to:
- a. *Funding* of defined benefit pension plans.
 - b. *Assignment of costs to time periods* for defined benefit pension plans.
 - c. *Magnitude of defined benefit pension plan obligations*, even for plans which are not funded or expensed on an actuarial basis.
 - d. *Comparison of actuarial present values* among alternative pension obligations.

Pension plans covered by this standard are those which have a primary objective of providing benefits on retirement, and which may also provide significant benefits on death, disability, or other termination of employment prior to retirement.

The great growth of American pension plans has occurred since World War II. During this period, actuarial procedures and techniques have been in a continual state of development. As a result, certain procedures developed in recent years and described in this standard may not be applicable retroactively.

The Code of Professional Conduct provides that if there is a conflict between this standard and applicable laws or regulations, such laws or regulations will govern, subject to appropriate disclosures.

- 1.3 Effective Date—The original version of this standard was adopted in 1988. The present reformatted version is effective for measurements made as of December 31, 1993, or later.

Section 2. Definitions

Terms used in this standard have the definitions assigned to them in Appendix II.

Section 3. Background and Historical Issues

Actuarial Standard of Practice No. 4 (ASOP No. 4) superseded *Pension Plan Recommendations A, B, and C* adopted by the American Academy of Actuaries in the period 1976 to 1983. The Interpretations of those Recommendations became Interpretations of ASOP No. 4, adopted by the Interim Actuarial Standards Board in January 1988, and became Illustrations 1, 2, and 3 of the present reformatted version.

The present reformatted version of ASOP No. 4 has been rearranged to conform with the uniform format adopted by the ASB in July 1988. There also have been some clarifying revisions. These include a statement about laws or regulations prevailing when there is a conflict with provisions of this standard (subsection 1.2); a clarification of the language in subsection 6.2(g) concerning expected changes in funding patterns, and a rearrangement of the wording in subsection 5.2.4 to conform with current law and practice.

Section 4. Current Practices and Alternatives

Actuarial calculations are performed for a number of purposes, examples of which are discussed below:

- 4.1 Cost and Benefit Recommendations—Calculations may be performed for purposes of determining actuarial cost and benefit recommendations, and related information. Examples are calculations related to:
- a. recommendations as to the funding or allocation of cost to time periods for defined benefit plans
 - b. recommendations as to the type and levels of benefits for specified contribution levels
 - c. contributions required under minimum funding standards imposed by statute or regulations
 - d. maximum contributions deductible for tax purposes
 - e. information required for the plan's or plan sponsor's financial statements
 - f. information required with respect to plan design

- g. determination of progress towards a defined financial goal, such as funding of vested or accrued benefits.

4.2 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:

- a. actuarial present value of accrued benefits
- b. actuarial present value of vested benefits
- c. actuarial experience gains or losses
- d. actuarial present value of benefits payable in the event of plan termination
- e. information required with respect to plan mergers, acquisitions, spinoffs, and business discontinuances
- f. expected future benefits or dividend return from insurance or annuity contracts.

4.3 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.

STANDARD OF PRACTICE

Section 5. Analysis of Issues and Recommended Practices

- 5.1 General—Measuring pension obligations is a process in which the actuary may be required to make judgments on the choice of actuarial assumptions, actuarial funding methods, and asset valuation methods. This standard analyzes and sets forth general recommendations for this process. The standard does not discuss or analyze in detail the actual selection of assumptions, funding methods, or asset valuation methods. These issues will be covered by separate standards. When these separate standards have been issued, some material in them may differ from that in ASOP No. 4. In that case, the newer material will supersede that in ASOP No. 4. After all the new standards have been issued, ASOP No. 4 will be completely revised to become a master document.
- 5.2 Procedures to Be Followed—In order to prepare pension actuarial calculations, the following procedures should be performed:
- a. Select a calculation date;
 - b. Determine plan provisions applicable to the calculation;
 - c. Gather data necessary for the calculation including participant information and asset information;
 - d. Select actuarial assumptions pertinent to the determination of the actuarial present value of benefits applicable to the calculation; and
 - e. Select a procedure to allocate costs to past and future periods. This procedure may include:
 1. an actuarial cost method
 2. an actuarial asset valuation method
 3. an amortization period
- 5.2.1 Calculation Date—Cost calculations should be made as of a specific date, with an adjustment for interest if contributions or cost accruals are to be made at a different date.
- a. Information as of a Different Date—Asset and participant information at the calculation date may be estimated on the basis of information furnished as of another date.

- b. Events after the Calculation Date—The treatment of events that are subsequent to the calculation date and prior to the date of the actuarial communication should be appropriate to the purpose for which the calculation is being performed.

Unless the purpose of the calculation requires the inclusion of such events, they need not be reflected until subsequent years. However, the actuary generally should disclose such events if the conclusions which would otherwise be reached would be significantly affected by such events. See subsection 5.2.2 for specific guidance on the treatment of amendments.

- 5.2.2 Plan Provisions—All provisions of the plan adopted and effective on or before the start of the plan year should generally be taken into account in measuring pension obligations, as should administrative practices with respect to matters not directly addressed in the plan.

The treatment of prospective plan changes should be appropriate to the purpose for which the calculation is being performed. In general:

- a. Provisions adopted on or before the calculation date and effective during the plan year should be reflected on at least a pro rata basis.
- b. Provisions adopted on or before the calculation date which are not effective until future years may, but need not, be reflected in current year funding or cost allocations.
- c. Provisions adopted after the calculation date need not be reflected until the following year.
- d. For purposes of projecting future years' funding or cost allocations, likely future changes in provisions, may, but need not, be reflected.

- 5.2.3 Asset and Participant Information—The actuary should consider the following issues with respect to the quality of information used for calculations:

- a. Reliance—The actuary will generally rely on the plan administrator, plan sponsor or other qualified third party for asset and participant information. While not responsible for auditing the information, the actuary should verify its reasonableness both directly and against other available information, such as prior years' data and reported benefit payments. If the actuary is not satisfied as to the reasonableness of the information, further inquiry should be made until the actuary is so satisfied.

- b. Accruals and Prepayments—Accrued contributions or prepayments should be reflected in assets on a basis consistent with the purpose and the reporting period for which costs are being determined, and costs should reflect interest equivalents on those accruals or prepayments.
- c. Participants—Generally, all participants should be reflected in the actuary’s calculations. Under appropriate circumstances, persons below a minimum age/service level may be excluded. Persons who are expected to become participants in the future, whether or not they are yet employed, may be reflected. Appropriate samples may be a satisfactory basis for the calculations.
- d. Insufficient Information—The actuary should not perform an actuarial calculation if the available information is substantially less than complete and there is sufficient uncertainty about the characteristics of the unknown information so that the results of the calculation are not adequate for the intended purpose.
- e. Hypothetical Data—It may be appropriate to prepare models or illustrations based on hypothetical data.

5.2.4 Actuarial Assumptions—The actuarial assumptions individually and in combination should reflect the actuary’s best judgment. The actuary should consider the actual experience of the covered group but should emphasize expected long-term future trends rather than give undue weight to recent past experience. In choosing the assumptions, the actuary should take into account, to the extent deemed suitable, general or specific information from other sources, including the plan sponsor, plan administrator, investment managers, accountants, etc.

- a. Identification of Assumptions—In preparing actuarial present value calculations in accordance with this standard, the actuary should consider the applicability of actuarial assumptions to such items as:

Economic Assumptions

1. inflation
2. investment return
3. compensation scale
4. government provided benefits
5. administrative expense

6. postretirement benefit increases

Noneconomic Assumptions

7. retirement ages
8. mortality
9. disability and disability recovery
10. voluntary termination
11. involuntary termination
12. family composition
13. marriage, remarriage and divorce
14. new entrants
15. employment age
16. election of optional forms of benefits
17. leaves, layoffs, transfers, and reinstatements
18. employment levels
19. curtailments triggering special benefit provisions
20. hours worked

- b. Assumptions Considered Individually and in Aggregate—The actuary should consider the reasonableness of each actuarial assumption independently on the basis of its own merits, its consistency with each other assumption, and the combined impact of all assumptions. In selecting actuarial assumptions in conjunction with the actuarial cost method employed, the actuary should consider the degree of uncertainty in assumptions, the potential for fluctuation, and the consequences of such fluctuations. In a plan where much of the obligation is associated with a small number of participants, special attention should be paid to potential fluctuations and the aggregate effect of the assumptions. When a particular aspect of the plan or a change in the plan is being valued, the actuary should consider whether the assumptions which in combination are appropriate for measuring overall plan costs are also appropriate for valuing the particular element under study.

- c. Effect of Changes on Assumptions—The actuary should consider that changes in plan design or external circumstances may significantly alter the level and trend of expected future experience. For example, a liberalization of early retirement benefits or external early retirement incentives may make advisable a revision in the assumed incidence of retirement.
- d. Plan-Specific Assumptions—In choosing actuarial assumptions, the actuary should consider not only information on general trends but specific information related to the plan. As a result of this information, the actuary may develop actuarial assumptions which differ from plan to plan or from group to group within a plan.
- e. Past Experience—Past experience of the covered group is reflected in current costs through actuarial gains and losses. It may also be useful in forming a judgment about future experience. The long-range, prospective nature of pension costs, however, dictates that the assumptions be based on expected long-term future trends.

5.2.5 Actuarial Cost Methods—The actuary should consider the following items in selecting and applying actuarial cost methods:

- a. Allocation Process—The allocation process inherent in an actuarial cost method employs two parameters—proration basis and period. The proration basis is most commonly compensation, service, or a rate (imputed or plan-derived) of benefit accrual. The period is the time interval over which cost is allocated. Allocations may be done by individual or on an aggregate basis.
- b. Allocation Methods—Once the proration basis and period parameters have been selected, an actuarial cost method defines the manner in which the actuarial present value of benefits is allocated over the period. Two fundamentally different ways in which this allocation has historically been made give rise to what can be characterized as the class of benefit allocation actuarial cost methods and the class of cost allocation actuarial cost methods.

The primary difference between the two classes is whether the actuarial present value factors are applied before or after the allocation. The benefit allocation actuarial cost methods (primarily the family of unit credit actuarial cost methods) and cost allocation actuarial cost methods are acceptable classes of actuarial cost methods. There is no inherent reason to consider as automatically unacceptable any actuarial cost method that might not be characterizable under either of the two classes.

- c. Acceptable Methods— An acceptable actuarial cost method should meet the following criteria:
1. The period over which the allocation is made for an individual should begin no earlier than the date of employment and not substantially later than the date of entry into the plan (e.g., completion of one year of service and attainment of age 21) and should not extend beyond the last assumed retirement age. Normally, the period of allocation should not end before the end of the period during which the participant is accruing a benefit under the plan. The period could be on an individual or group basis.
 2. The proration basis by which the allocation is made should usually have a logical relationship to some element of the plan's benefit formula. Acceptable bases include compensation, service, (rate of) benefit accrual, or any reasonable proxy for one or a combination of these. The proration basis could be applied on either an individual or group basis (e.g., the actuarial present value of plan benefits for each individual allocated by that individual's own compensation or the actuarial present value of plan benefits for the whole active life population allocated by the aggregated compensation).
- d. Relationship between Method and Policy—Even where a plan sponsor's cost allocation or funding policy for a particular plan is based on an acceptable actuarial cost method, that method will, in most instances, influence the cost allocation or funding decision, but will not determine it. For example, an actuarial cost method's actuarial accrued liability at plan inception may define an unfunded actuarial accrued liability, but it will not define the amortization policy under which that amount is allocated or funded.
- e. Benefit Security—In many cases, benefit security depends to a significant degree on the accumulation of sufficient plan assets. In these cases, concern about benefit security is an integral part of an actuarial cost method's acceptability as a basis for funding. Methods such as pay-as-you-go and terminal funding may not produce adequate benefit security.
- f. External Factors—The adequacy and desirability of an otherwise acceptable actuarial cost method should be examined by the actuary within the context not only of its parameters and consequences but also of whatever knowledge the actuary has of other matters (such as the plan sponsor's policy concerning the amortization period) that help determine the cost allocation or funding decision.

5.2.6 Valuation of Assets—Relationship to Overall Results—The valuation of assets, the investment return assumption, the determination of the actuarial present values, and the intended use of the calculations are interdependent, and one cannot be considered in isolation from the others.

- a. Reflection of Market Value—The valuation of assets should generally reflect some function of market value. However, it may be appropriate to use:
1. methods which smooth out the effects of short-term volatility in market value;
 2. amortized cost values for evidence of indebtedness; and
 3. methods which relate to the investment return assumption used in determining the actuarial present values, such as discounting the expected future cash flow generated by the investments.

If current market value is not used directly, it should nonetheless be disclosed, as should details of the method used.

- b. Market Value Not Determinable—Not all types of assets have a readily determinable current market value. Examples include certain insurance contracts and real estate. If market values are not available with respect to significant portions of the assets, the actuary should disclose this fact and the asset valuation method used for such assets.

5.2.7 Amortization—Factors Considered—Amortization may be required for such things as initial or unfunded actuarial liabilities, actuarial gains and losses and changes in actuarial liabilities due to plan amendments or changes in actuarial assumptions. The choice of an amortization period or range of periods should reflect:

- a. Any known limitations in the continuing ability of the plan sponsor to fund the plan. For example, consideration should be given to the probable future careers of the firm's principals for the plan of a small professional corporation, or the probable future lifetime of the plan sponsor;
- b. The period over which the sponsor is benefited by the plan provision giving rise to the actuarial present value being amortized;
- c. The existing relationship between assets and actuarial liabilities;
- d. Progress towards meeting cash flow needs or a desired funding goal; and
- e. Permissible smoothing of costs or contributions.

The pattern of amortization during each selected period should be rational and systematic, such as a level annual dollar amount or a level percentage of participants' payroll.

- 5.3 Actuarial Present Value of Benefits Accrued to Date—The actuary may calculate actuarial present values of accrued benefits, where such calculations are supplemental to, and independent of, calculations made under the actuarial cost method used for determining pension cost or benefit recommendations. Frequently, the results of such calculations are compared to available assets as one measure of the funded status of the plan. Such supplemental calculations of actuarial present values would normally fall into three broad categories as set forth in the rest of this subsection.

The procedures used to determine the actuarial present value of accrued benefits should reflect the actuary's best judgment as to the most meaningful figure for such actuarial present value in light of the purposes for which the calculation is to be used. In presenting the results, the actuary's report should clearly indicate the treatment afforded to matters such as the following:

- a. the manner in which benefits are calculated in the case of a plan which limits the number of years that may be credited or which has a non-uniform benefit accrual formula;
- b. whether a projection of future earnings was applied in calculating benefits accrued to the calculations date;
- c. whether recognition was given to any benefits which, if an employee continued in employment, could become payable before normal retirement age with an actuarial present value greater than the actuarial present value of the accrued normal retirement benefit;
- d. whether benefit increases scheduled to occur after retirement were recognized;
- e. whether Social Security benefits, under an integrated offset plan, were reflected in full or prorated; and
- f. whether average Social Security covered earnings, if applicable under an integrated step-rate plan, were related to past service only or were projected to normal retirement.

Note: see also Illustration 2 in Appendix I.

- 5.4 Actuarial Present Value of Benefits Payable upon Plan Termination—Where calculations are required to determine the actuarial present value of benefits payable in the event of a plan termination, the actuary may be required to calculate the actuarial present value of benefits payable for each relevant class of participants in accordance with termination

priorities specified in the plan. The actuary should first determine the plan benefits for each covered participant as if the plan were terminating as of the calculation date. The actuary should then calculate the actuarial present value of such benefits by applying actuarial assumptions appropriate to a plan in the process of termination, such assumptions generally being limited to mortality, investment return, retirement age, election of optional forms and expense charges.

- 5.5 Actuarial Present Value of Vested Benefits—Where calculations are required in the case of an active plan to determine the actuarial present value of vested benefits, the actuary should calculate the accrued benefit as of the calculation date. This benefit should then be multiplied by the vesting percentage defined under the plan.

The actuary should then calculate the actuarial present value of such benefits by applying factors based on actuarial assumptions applicable to an active plan situation. The assumed investment return should be consistent with the plan's actuarial asset valuation method. The calculations should be made in accordance with the following procedures, to the extent they are applicable:

- a. No recognition should be given to any benefit to which a covered employee could, only through advancement in service or age while in active employment, become entitled.
- b. Cost-of-living or other benefit increases specified by the plan and assumed to occur after retirement, death, or other termination should be recognized.
- c. There should be no projection of Social Security benefits or Social Security covered earnings, other than as specified by the plan for the purpose of determining the benefit of a covered employee who retires or terminates service on the calculation date.

Note: See also Illustration 1 in Appendix I.

- 5.6 Actuarial Present Value of Accrued Benefits under an Active Plan—Under many pension plans, benefits accrued to the calculation date are directly computed on the basis of historical employee records. In such cases the actuary generally should calculate the actuarial present value of accrued benefits on the basis of such directly computed accrued benefits.

A substantial number of pension plans contain features such that an actuary may wish to employ an alternative calculation. Examples of such plans are:

- a. plans with maximum credited service provisions or other non-uniform benefit accrual formulas;

- b. plans with Social Security offset provisions where credited service used to compute such offsets is limited to a shorter period of credited service than that used to compute the gross pension benefit;
- c. plans providing early retirement benefits with an actuarial present value greater than the actuarial present value of the accrued benefit to which the participant would be entitled commencing at normal retirement date;
- d. plans with automatic cost-of-living increases; and
- e. contributory plans under which the plan's accrued benefit may have an actuarial present value less than that of accumulated employee contributions.

5.7 Approximations—The actuary may use appropriate approximations consistent with the intent of this standard. Approximations, including the use of samples, are only acceptable if the results can reasonably be expected not to differ significantly from the results of detailed calculations, given the intended use of the calculations.

5.7.1 Adjustment of Prior Calculation—In deciding whether an approximation based on a prior calculation may be used in lieu of a detailed calculation, the actuary should consider such items as:

- a. changes in number of participants;
- b. changes in covered payroll;
- c. changes in the average age and service of participants;
- d. amendments to plan provisions;
- e. changes in external factors; and
- f. length of period since a detailed actuarial valuation was performed.

In approximating results based on prior actuarial calculations, the actuary should project assets and actuarial liabilities in a consistent manner.

5.7.2 Ancillary Benefits—In deciding whether an approximation may be used in lieu of a detailed calculation for ancillary benefits, the actuary should consider such items as:

- a. the magnitude of the benefit and its associated actuarial liabilities; and
- b. the pattern of cost allocation in the approximation.

- 5.8 Actuary’s Responsibility—A fundamental consideration in a funding program is the extent to which assets can reasonably be expected to ultimately exceed or fall short of the value of accrued benefits.

This standard indicates that the actuary does not have complete responsibility for each element of the pension funding and cost allocation decisions, but shares responsibility for certain elements with the plan sponsor, attorney, accountant, and statutory authorities. Nevertheless, the actuary remains responsible for assessing the implications of the overall results, in terms of short- and long-range benefit security and expected cost progression.

The extent to which benefits of a plan should be funded in advance of the date when they must be paid is a decision to be made by the plan sponsor, with the assistance of the actuary, in light of many factors, including regulatory requirements, collective bargaining considerations and alternative uses of money.

Section 6. Communications and Disclosures

- 6.1 Actuarial Communications—Interpretative Opinion 3 of the Actuarial Standards Board applies to all written communications by actuaries on actuarial subjects and, unless clearly inapplicable, to oral communications as well. Section (a)(2) of the Opinion states that: “The form and content of any actuarial communication should meet the needs of the particular circumstances, taking into account the knowledge and understanding of the users and the actuary’s relationship to the users.” A pension actuarial communication provides information directed towards plan sponsors, government bodies, employee groups, or other members of the public in connection with the design, revision, valuation, or pricing of employee retirement plans. Section 6 of this standard supplements Opinion 3 regarding pension actuarial communications.
- 6.2 General Requirements—Not all of the items of information set forth in this section need be presented in every pension actuarial communication; what must be included depends upon the situation. The communication should include, either directly or by reference to prior communications, sufficient information so that:
- a. it would be properly interpreted and applied by the person or persons to whom the communication is directed, and,
 - b. another actuary in pension practice could form an opinion about the reasonableness of the conclusion.
- 6.3 Specific Requirements—The pension actuarial communication, in addition to including the name of the actuary responsible for its content, should contain, either directly or by reference to accessible prior communications, the following elements, where pertinent:
- a. The name of the person or firm retaining the actuary and the purposes that the communication is intended to serve.

- b. An outline of the benefits being discussed or valued and of any significant benefits not included in the actuarial determinations pursuant to paragraph 5.2.2 or otherwise.
- c. A statement as to the effective date of the calculations, the date as of which the participant and financial information were compiled, and the sources and adequacy of such information.
- d. If the information used is not substantially complete and accurate, including the situation where a sample has been used, a statement including the following items:
 - 1. The type and magnitude of unknown or unused information.
 - 2. The assumptions and techniques applied with respect to such information.
 - 3. The likely relationship between the information used and the universe which it is intended to represent.
 - 4. The probable effect of such information on the adequacy of the results in the context of their intended use.

If hypothetical data are used, the data should be fully described.

- e. A summary of the participant information, separated into significant categories such as active, retired, and terminated-vested. Actuaries are encouraged to include a detailed display of the characteristics of each category and a reconciliation with prior reported data.
- f. A summary of asset information and a derivation of the actuarial value of assets. Actuaries are encouraged to include an asset summary by category of investment and a reconciliation with prior reported assets showing total contributions, benefits, investment return, and any other reconciliation items.
- g. A description of the actuarial assumptions and cost method and the asset valuation method. Changes in assumptions and methods from those used in previous communications should be stated and their effects noted. If the actuary expects that the long-term trend of costs resulting from the continued use of present assumptions and methods would result in a significantly increased or decreased cost basis, this should also be communicated.
- h. A statement of the findings, conclusions, or recommendations necessary to satisfy the purpose of the communication and a summary of the actuarial determinations upon which these are based. The communication should include applicable actuarial information regarding statutory minimum funding, tax deductibility, and

financial reporting. Actuaries are encouraged to include derivations of the items underlying these actuarial determinations.

- i. A disclosure of any facts which, if not disclosed, might reasonably be expected to lead to an incomplete understanding of the communication.
- 6.4 Disclosure of Approximation Techniques—The fact that a report is based on approximations rather than detailed calculations and the approximation techniques used should be disclosed in the report.
 - 6.5 Degree of Disclosure—The adequacy of the results of a pension actuarial calculation depends to a great degree on the completeness and accuracy of the information used. As the completeness and accuracy decrease, the actuary should increase the details of the disclosure regarding such information.
 - 6.6 Deviation from Standard—An actuary must be prepared to justify the use of any procedures that depart materially from those set forth in this standard and must include, in any actuarial communication disclosing the results of the procedures, an appropriate statement with respect to the nature, rationale, and effect of such departures.

Appendix I—Illustration 1

Calculation of the Actuarial Present Value of Vested Benefits

Subsection 5.5 defines acceptable practice for calculating the actuarial present value of vested benefits of an active plan, as required, for example, by Schedule B—Actuarial Information—of Internal Revenue Service Form 5500.

The implication of subsection 5.5 for a Form 5500 Schedule B calculation for an ongoing plan is illustrated by the following example:

a. Given:

- i. Benefit rate of \$10 per month per year of service;
- ii. Normal retirement at age 65, irrespective of service; retirement not compulsory;
- iii. Unreduced benefits upon early retirement from active employment at age 62 with 20 years of service.
- iv. Unreduced benefits upon early retirement prior to age 62 with 30 years of service; Social Security make-up benefits of \$200 per month payable until age 62.
- v. Reduced benefits upon early retirement from active employment after age 55 and prior to age 62 with 20 years of service; reduction is 4% for each year by which retirement precedes age 62.
- vi. Deferred vested benefit, commencing at age 65, upon termination with 5 years of service; benefit payments (at full actuarially reduced value) may also be elected to commence as early as age 55 if 20 or more years of service have been completed.
- vii. The actuary uses a full range of decrements including termination rates at all ages below age 65 when not eligible for early retirement, early retirement rates at all ages when eligible below age 65, and normal retirement rates at all ages 65 and over.

b. The following calculations are intended:

- i. Employee under age 65 with less than 5 years of service—no value;
- ii. Employee under age 65 with 15 years of service—Value deferred benefit of \$150 payable at age 65 in case of withdrawal before age 65, or benefit of \$150 payable on normal retirement at age 65 or later, using valuation assumptions as to

termination rates from present age to age 65 and as to normal retirement rates from age 65;

- iii. Employee under age 55 with 20 years of service—value deferred benefit of \$200 payable at age 65 in case of withdrawal before age 55, or benefit of \$200 with full actuarial reduction from age 65 payable on early retirement at ages 55 to 65; or benefit of \$200 payable on normal retirement at age 65 or later, using valuation assumptions as to withdrawal rates from present age to age 55, as to early retirement rates from age 55 to age 65, and as to normal retirement rates from age 65;
- iv. Employee at age 55 with 20 years of service—value benefit of \$144 (72% of \$200) payable on early retirement at age 55 increasing by \$8 annual steps to \$200 payable on early or normal retirement at age 62 or later, using assumptions as to retirement rates from age 55;
- v. Employee under age 62 with 30 years of service—value benefit of \$300 payable on early or normal retirement plus temporary benefit of \$200 payable to age 62 if retiring early before that age, using valuation assumptions as to retirement rates from present age;
- vi. Employee at age 62 or over with 20 years of service—value benefit of \$200 payable on early or normal retirement, using valuation assumptions as to retirement rates from present age;
- vii. Employee at age 65 or over—value benefit of \$10 per year of service payable on normal retirement, using valuation assumptions as to retirement rates from present age;
- viii. Inactive employee under age 65 separated after 5 years of service—value deferred vested benefit of \$50 payable at age 65.

If benefits payable under the plan prior to normal retirement are provided on an actuarially equivalent basis, calculations may be simplified by applying appropriate deferred annuity values to the accrued monthly benefit. If the plan *does* provide benefits payable prior to normal retirement date in excess of an actuarial equivalent benefit, calculations may similarly be simplified for those employees who have not attained sufficient age and/or service to qualify for such benefits. In this case also the simplification consists of applying appropriate deferred annuity values to the accrued monthly benefit applicable to such employees.

It should be noted that subsection 5.5 applies to calculations for an active plan which customarily involve many employees who have not terminated. It is recognized that on occasion computations assuming employment and/or plan termination may be necessary, for example to fulfill plan termination or other requirements of ERISA. Under such

circumstances, appropriate modifications of the above procedures must be made, as described in subsection 5.4.

Appendix I—Illustration 2

Calculation of the Actuarial Present Value of Accrued Benefits under an Active Plan

Subsection 5.3 allows flexibility to the actuary in determining the actuarial present value of accrued benefits under an active plan within the scope of these sections. This illustration provides for consistent practice in the determination of the actuarial present value of accrued (or accumulated) benefits which might be disclosed in Schedule B of Form 5500, where required, or in a statement accompanying a plan's financial statements. A comparison of such actuarial present value of accrued benefits with the actuarial value of assets will provide a measure under an active plan of the progress which is being made toward the funding of the benefits which are accruing, according to measurement methods reasonably consistent for all plans. Other actuarial calculations ordinarily are necessary to measure the progress made in meeting the long-range funding objectives of the plan sponsor, to ascertain the status of the plan if it were terminated or to determine statutory funding requirements.

- a. The present value of accrued benefits represents the present value, at the date of determination, of (i) the benefits expected to be paid with respect to former employees who have retired or who have terminated service with vested rights; (ii) the benefits expected to be paid to beneficiaries of employees who have died; and (iii) the accrued benefits based on service rendered and compensation earned prior to the date of determination, which are expected to become payable with respect to present employees; taking into account the regular valuation assumptions as to mortality and, in the case of present employees, such other matters as withdrawal, retirement, disability and future service accrual for benefit eligibility.
- b. The accrued benefit related to one contingency may differ from the accrued benefit related to another, e.g., retirement, termination from service and death. The following are guidelines for determining the amounts of accrued benefit.
 - i. If the accrued benefit is specifically defined in the plan document or is clearly implied by the plan's provisions, that definition will be followed for the contingencies to which it is applicable.
 - ii. If (i) does not apply and the benefit type is includible in the present value of vested benefits, the benefit will be considered to accrue in proportion to the ratio of completed years of benefit service to projected years of benefit service when it first becomes fully vested. Therefore, if an employee has satisfied the requirements for full vesting, the accrued benefit will be computed as in Illustration 1.
 - iii. Any other benefit will be assumed to accrue in proportion to the ratio of completed years of benefit service to projected years of benefit service upon anticipated separation from covered employment.

- c. In the regular valuation of a plan, the actuary may be using an implicit approach to the choice of actuarial assumptions in the selection of the salary increase and investment return assumptions. Inasmuch as the calculations to be performed within the scope of this illustration do not involve the anticipation of future salary increases, the actuary should use an explicit approach in his consideration of an appropriate investment return assumption.

The degree of conservatism, if any, which the actuary chooses to reflect in his consideration of an appropriate investment return assumption for the purposes of this illustration need not be the same as that reflected in the regular valuation investment return assumption.

- d. Automatic cost-of-living or similar benefit increases specified by the plan and expected to occur after retirement, death or other termination should be recognized, using an inflation assumption which is consistent with the assumed rate of investment return.
- e. Increases in the level of benefits which become effective in the future need not be recognized even though they have already been adopted.
- f. In the determination of Social Security benefits the employee's compensation as of the date of determination should be assumed to continue unchanged during his assumed future service, i.e., until his termination, retirement, etc., according to the actuarial assumptions. Calculations related to the Social Security law should not take into account any changes in the law or increases in the wage base or consumer price index subsequent to the date of determination.
- g. In determining an appropriate actuarial value of assets which may be compared to the actuarial present value of accrued benefits, subsection 5.2.6 should be followed.
- h. The actuary may be required, or may feel it is appropriate, to distinguish between the portion of the actuarial present value of accrued benefits which is vested and the portion which is not vested. Illustration 1 defines acceptable practice for calculating the actuarial present value of vested benefits of an active plan, as required, for example, by Schedule B of Form 5500 and should be applied in determining the portion of the actuarial present value of accrued benefits which is vested.

Because a breakdown of the present value of accrued benefits among the plan termination categories under ERISA generally is of little significance for an active plan, it is not intended that such a breakdown will be made in the usual case.

- i. In all cases, approximations consistent with subsection 5.7 may be utilized.
- j. Benefits to be provided under an insurance company contract which are not fully guaranteed by the insurance company should be taken into account in determining the actuarial present value of accrued benefits. Fully guaranteed benefits should be included

in or excluded from this calculation, depending on whether or not the assets standing behind these benefits are included in the asset value with which the actuarial present value of accrued benefits is being compared.

- k. The actuary should indicate that the determination of the actuarial present value of accrued benefits has been made in accordance with generally accepted actuarial principles and practices. The sources of the data used in the calculations, as well as the investment return assumption and the other assumptions used should be disclosed. In addition, the actuary should identify any limitation on the use of the calculations for various purposes which he feels are appropriate. Although comparative figures for the current year and prior year should be shown (after the first year the statement is prepared), a complete reconciliation of the actuarial present value of accrued benefits from year to year is not required. However, the impact of significant changes in the actuarial assumptions, plan provisions and Social Security legislation should be disclosed. A sample statement of actuarial present value of accrued benefits and a sample actuary's opinion are attached.

The application of this illustration for determining the actuarial present value of accrued benefits under an active plan is illustrated by the following Examples A and B.

Example A

It is assumed that the actuary uses a table incorporating decrements for termination at ages below 55, as well as for death at all ages. Further, all surviving active employees are assumed to retire at age 63 (or attained age, if greater) with unreduced benefits.

- a. Given:
 - i. Benefit rate of \$10 per month per year of service.
 - ii. Normal retirement at age 65, irrespective of service. Retirement not compulsory.
 - iii. Unreduced immediate benefit upon early retirement from active employment at age 62 or over.
 - iv. Reduced immediate benefit upon early retirement from active employment after age 55 and before age 62 with 20 years of service. Reduction is 4% for each year by which retirement precedes age 62.
 - v. Deferred vested benefit, commencing at age 65, upon termination with 5 years of service. Benefit payments (at full actuarially reduced value) may also be elected to commence as early as age 55 if 20 or more years of service have been completed.

- vi. Spouse's benefit upon death in active service after meeting eligibility requirements for early or normal retirement equal to \$5 per month per year of service.

b. The following calculations are intended:

Type of Benefit	Payable Upon Separation From Service at Ages	Amount of Benefit	Benefit Starts At	Duration of Benefit
Age 25 and 5 Years of Service				
(1) Deferred Vested	25-54	\$ 50	Age 65	Life
(2) Unreduced Early	63	50	Age 63	Life
(3) Spouse	55-62	25	Death in Service	Life of Spouse
Age 40 and 5 Years of Service				
(1) Deferred Vested	40-54	\$ 50	Age 65	Life
(2) Unreduced Early	63	50	Age 63	Life
(3) Spouse	55-62	25	Death in Service	Life of Spouse
Age 45 and 10 Years of Service				
(1) Deferred Vested	45-54	\$100	Age 65	Life
(2) Unreduced Early	63	100	Age 63	Life
(3) Spouse	55-62	50	Death in Service	Life of Spouse
Age 50 and 20 Years of Service				
(1) Deferred Vested	50-54	\$200	Age 65	Life
(2) Unreduced Early	63	200	Age 63	Life
(3) Spouse	55-62	100	Death in Service	Life of Spouse
Age 60 and 10 Years of Service				
(1) Unreduced Early	63	\$100	Age 63	Life
(2) Spouse	62	50	Death in Service	Life of Spouse

Example B

It is assumed that the actuary uses a full range of decrements including termination rates and disablement rates at ages below age 65, early retirement rates at ages when eligible below age 65, and normal retirement rates at ages 65 and over.

a. Given:

- i. Benefit rate of \$10 per month per year of service.
- ii. Normal retirement at age 65, irrespective of service. Retirement not compulsory.
- iii. Unreduced immediate benefit upon early retirement from active employment at age 62 with 20 years of service.
- iv. Unreduced immediate benefit upon early retirement from active employment before age 62 with 30 years of service. Social Security make-up benefit of \$200 per month payable until age 62.
- v. Reduced immediate benefit upon early retirement from active employment after age 55 and before age 62 with 20 years of service. Reduction is 4% for each year by which retirement precedes age 62.
- vi. Unreduced immediate benefit upon total and permanent disability before age 65 with 10 years of service.
- vii. Deferred vested benefit, commencing at age 65, upon termination with 5 years of service. Benefit payments (at full actuarially reduced value) may also be elected to commence as early as age 55 if 20 or more years of service have been completed.
- viii. Spouse's benefit upon death in service after meeting eligibility requirements for early or normal retirement (30 years of service, age 55 and 20 years of service, or age 65) equal to \$5 per month per year of service.

b. The following calculations are intended:

Type of Benefit	Payable Upon Separation From Service at Ages	Amount of Benefit	Benefit Starts At	Duration of Benefit
Age 25 and 5 Years of Service				
(1) Deferred Vested	30-49	\$ 50	Age 65	Life
(2) Unreduced Early	50-64	50	Retirement	Life
(3) Social Security Make-up	50-61	33*	Retirement	To Age 62
(4) Normal	65 and Over	50	Retirement	Life
(5) Spouse	50 and Over	25	Death in Service	Life of Spouse
(6) Disability	30-64	50	Disablement	Life
Age 40 and 5 Years of Service				
(1) Deferred Vested	45-54	\$ 50	Age 65	Life
(2) Reduced Early	55-61	36 at Age 55 Increasing \$2 a Year to Age 61	Retirement	Life
(3) Unreduced Early	62-64	50	Retirement	Life
(4) Normal	65 and Over	50	Retirement	Life
(5) Spouse	55 and Over	25	Death in Service	Life of Spouse
(6) Disability	45-64	50	Disablement	Life
Age 45 and 10 Years of Service				
(1) Deferred Vested	45-54	\$100	Age 65	Life
(2) Reduced Early	55-61	72 at Age 55 Increasing \$4 a Year to Age 61	Retirement	Life
(3) Unreduced Early	62-64	100	Retirement	Life
(4) Normal	65 and Over	100	Retirement	Life
(5) Spouse	55 and Over	50	Death in Service	Life of Spouse
(6) Disability	45-64	100	Disablement	Life

Age 50 and 20 Years of Service				
(1) Deferred Vested	50-54	\$200	Age 65	Life
(2) Reduced Early	55-59	144 at Age 55 Increasing \$8 a Year to Age 59	Retirement	Life
(3) Unreduced Early	60-64	200	Retirement	Life
(4) Social Security Make-up	60-61	133*	Retirement	To Age 62
(5) Normal	65 and Over	200	Retirement	Life
(6) Spouse	55 and Over	100	Death in Service	Life of Spouse
(7) Disability	50-64	200	Disablement	Life
Age 50 and 30 Years of Service				
(1) Unreduced Early	50-64	\$300	Retirement	Life
(2) Social Security Make-up	50-61	200*	Retirement	To Age 62
(3) Normal	65 and Over	300	Retirement	Life
(4) Spouse	50 and Over	150	Death in Service	Life of Spouse
(5) Disability	50-64	300	Disablement	Life
Age 60 and 10 Years of Service				
(1) Deferred Vested	60-64	\$100	Age 65	Life
(2) Normal	65 and Over	100	Retirement	Life
(3) Spouse	65 and Over	50	Death in Service	Life of Spouse
(4) Disability	60-64	100	Disablement	Life

* Because the Social Security make-up benefit is one which is includible in the computation of the present value of vested benefits, the \$200 monthly benefit is assumed to accrue uniformly over the first 30 years of service (see Illustration I(b)(ii)). If, on the other hand, there had been specified a benefit which is never includible in the computation of the present value of vested benefits, such as a \$200 monthly benefit payable in the event of the employee's death after 30 years of service, the accrued death benefit to be valued in the age 25 and 5 years of service example would have been \$33 (5/30 of \$200) for death at age 50, \$32 (5/31 of \$200) for death at age 51, and so on.

c. If, in the example, there were a maximum service limit of 30 years applicable at normal or early retirement or disablement, with a pro rata portion of the expected normal retirement benefit payable on vested termination, the only changes in the amount of benefit would be for the deferred vested benefit:

Age 25 and 5 Years of Service \$ 33 (5/45 of \$300)
Age 50 and 20 Years of Service \$171 (20/35 of \$300)

**Sample Statement of Actuarial Present
Value of Accrued Benefits**

XYZ CORPORATION PENSION PLAN

Actuarial Present Value Of Accrued Benefits	January 1, 1980	January 1, 1979
Retired participants and beneficiaries of deceased participants	\$ xxx	\$ xxx
Terminated participants with vested interests	xxx	xxx
Active participants	<u>xxx</u>	<u>xxx</u>
Total	\$ xxx	\$ xxx

Notes:

1. The actuarial value of assets, corresponding to the total actuarial present values of accrued benefits, was \$xxx at January 1, 1980 and \$xxx at January 1, 1979, respectively. The actuarial value of assets is equal to the average market value of assets of the plan as of the computation date and the four preceding January 1's with an adjustment to reflect the cash flow during this period. This formula is used to smooth out fluctuations in the market value of assets, which was \$xxx at January 1, 1980 and \$xxx at January 1, 1979.
2. A comparison of the actuarial present value of accrued benefits with the actuarial value of assets provides a measure under an active plan of the progress which is being made toward the funding of the benefits which are accruing, according to measurement methods reasonably consistent for all plans. Other actuarial calculations ordinarily are made to determine year-to-year contribution levels.
3. The actuarial values which would apply in the event the plan were terminated would differ from those shown, for many reasons including, but not necessarily limited to, the following:
 - a. Certain plan provisions which may apply in the event of partial or complete plan termination are not reflected in the benefits valued nor in the actuarial assumptions employed.
 - b. Vested benefits may be limited with reference to the value of the assets of the fund.
 - c. Certain vested benefits may be insured by the Pension Benefit Guaranty Corporation.
 - d. Actuarial computations under actuarial assumptions other than those specified herein may be required as a basis for determining plan benefits in the event of a partial or complete termination of the plan.

- e. Benefits deemed already earned may not be the same as those underlying the actuarial values shown.
4. The benefits reflected above have been determined on the basis of the plan provisions in effect on the respective dates. No recognition was given at January 1, 1979 to benefit increases which became effective on October 1, 1979; or at January 1, 1979 and January 1, 1980 to benefit increases scheduled to become effective on May 1, 1980 and May 1, 1981. The amendments effective October 1, 1979 caused an increase of approximately \$xxx in the actuarial present value of accrued benefits as of January 1, 1980. Benefits under the plan are based on a participant's compensation during his last five years of credited service. The actuarial present values shown above for active participants are based on estimated average compensation during the five years ending on the respective dates of determination. Benefits payable under all circumstances—retirement, death, disability and vested termination of employment—are included, to the extent that they are deemed to have accrued as of the computation dates.
5. The actuarial present value was determined by the actuary on the basis of employee data supplied by the plan administrator (sponsor), the provisions of the plan as supplied by the plan administrator (sponsor), and actuarial assumptions as described in note 6. The plan administrator (sponsor) has stated that, to the best of his knowledge, the employee data is accurate and complete and that the plan provisions provided the actuary are accurate and complete as of the valuation date. The actuarial value of assets was determined by the actuary on the basis of information supplied by the plan administrator (sponsor).
6. There have been no changes in actuarial assumptions since the previous valuation. The principal actuarial assumptions used in determining the actuarial present values shown are as follows:

Investment return: X% compounded annually (after deducting expenses)

Mortality: The _____ Mortality Table.

Withdrawal: Rates ranging from X% at age 18 to X% at age 55 and over.

Retirement: Rates ranging from X% at age 48 to X% at age 62, X% at ages 63 and 64, X% at ages 65 through 69 and 100% at age 70.

Spouse benefits: X% of men and X% of women married with wife _____ years younger than husband.

Sample Actuary's Opinion

This Statement has been prepared in accordance with generally accepted actuarial principles and practices and, to the best of our knowledge, fairly reflects the actuarial present value of accrued benefits of the (Name of Plan) as of (Date) and (Date).

In preparing this Statement, we have relied upon information provided to us regarding plan provisions, plan participants, plan assets and other matters, as more fully detailed in the notes to the Statement. In particular, we call attention to the fact that information as to (TYPE) has been certified to by (Name of Certified Public Accountants).

The present values shown herein have been estimated on the basis of actuarial assumptions which, in the opinion of the actuary, are appropriate for the purposes of the Statement, are reasonable in the aggregate (taking into account the experience of the plan and reasonable expectations), and, when applied in combination, represent his (her) best estimate of the measure of anticipated experience under the plan.

(Name of Firm, Date, Signature, Professional Designation)

Appendix I—Illustration 3

The Appropriate Use of the Accrued Benefit Method with Proration Based on Compensation

Subsection 5.2.5 refers to generally accepted actuarial methods. This illustration provides guidance for the appropriate use of the accrued benefit method with proration based on compensation¹ under plans where the use of actuarial valuation results affects the security of employee benefits.

The accrued benefit method as applied by first projecting retirement benefits to expected retirement and then basing the supplemental present value and the current cost upon prorated portions of the total present value of the projected benefit, with such proration based upon compensation, is appropriate if the following conditions are met:

1. The plan's benefits are pay related.
2. In actual use, the actuarial present value of the plan's benefits, assigned under the method to service prior to a valuation date, is at least as great as the actuarial present value of the benefits accrued to that date under the plan's terms, all determined using the regular valuation actuarial assumptions. The actuary should satisfy himself initially that this condition will continue to be met at future times if each actuarial assumption is exactly realized and should be prepared to demonstrate as of any valuation date that this condition is, in fact, being met at such time.

Condition 2 above will be deemed satisfied if, in the application of the method, the regular salary scale assumption is applied both retrospectively and prospectively for deriving both numerator and denominator of the compensation proration fraction and if compensation levels are weighed to reflect differences in benefit accrual rates applicable to various years of service.

Because cost levels under the method may tend to change and because the method has not been widely used, the actuary should be especially conscious of his responsibility to fully understand and explain the method and its implication for funding.

1

All actuaries are hereby advised that under final regulations issued by the IRS, the accrued benefit method with proration based on compensation is *not* currently permitted for determining ERISA minimum funding requirements under Section 412 of the Internal Revenue Code.

For further information on the scope, nature, and applications of these regulations, actuaries are directed to 45 *Federal Register* 86428 (Dec. 31, 1980): 26 CFR Part I.

Appendix II—Pension Actuarial Terminology

Section A—Core Terms

A-1. 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. For purposes of this standard, each such amount or series of amounts is:

- a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, Social Security, marital status, etc.),
- b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
- c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

A-2. Actuarial Cost Method or Funding Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Note: An Actuarial Cost Method is understood to be a Closed Group Actuarial Cost Method unless otherwise stated.

A-3. Normal Cost or Normal Actuarial Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Note 1: The presentation of Normal Cost should be accompanied by reference to the Actuarial Cost Method used.

Note 2: Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment).

Note 3: For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.

A-4. Actuarial Accrued Liability, Actuarial Liability, Accrued Liability, or Actuarial Reserve

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Note: The presentation of an Actuarial Accrued Liability should be accompanied by reference to the Actuarial Cost Method used; for example, by hyphenation (“Actuarial Accrued Liability—XYZ,” where “XYZ” denotes the Actuarial Cost Method) or by a footnote.

A-5. Actuarial Value of Assets or Valuation Assets

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Note: The statement of Actuarial Assumptions should set forth the particular procedures used to determine this value.

A-6. Unfunded Actuarial Accrued Liability, Unfunded Actuarial Liability, Unfunded Accrued Liability, or Unfunded Actuarial Reserve

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

Note: This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, the excess of the Actuarial Value of Assets over the Actuarial Accrued Liability, or the Funding Excess.

A-7. Unfunded Frozen Actuarial Accrued Liability or Unfunded Frozen Actuarial Liability

An Unfunded Actuarial Accrued Liability which is not adjusted (“frozen”) from one Actuarial Valuation to the next to reflect Actuarial Gains (Losses) under certain Actuarial Cost Methods. Generally, this amount is adjusted by any increments or decrements in Actuarial Accrued Liability due to changes in pension plan benefits or Actuarial Assumptions subsequent to the date it is frozen. Adjustments are made from one Actuarial Valuation to the next to reflect the addition of interest and deduction of Amortization Payments.

A-8. Actuarial Gain (Loss) or Experience Gain (Loss)

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Note 1: The effect on the Actuarial Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method or pension plan provisions should be described as such, not as an Actuarial Gain (Loss).

Note 2: The manner in which the Actuarial Gain (Loss) affects future Normal Cost and Actuarial Accrued Liability allocations depends upon the particular Actuarial Cost Method Used.

Appendix II—Pension Actuarial Terminology

Section B—Actuarial Cost Methods

B-1. Unit Credit Actuarial Cost Method

A method under which the benefits (projected or unprojected) of each individual included in an Actuarial Valuation are allocated by a consistent formula to valuation years. The Actuarial Present Value of benefits allocated to a valuation year is called the Normal Cost. The Actuarial Present Value of benefits allocated to all periods prior to a valuation year is called the Actuarial Accrued Liability.

Note 1: The description of this method should state the procedures used, including:

- a. how benefits are allocated to specific time periods;
- b. the procedures used to project benefits, if applicable; and
- c. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, generally reduce (increase) the Unfunded Actuarial Accrued Liability.

B-2. Entry Age Actuarial Cost Method or Entry Age Normal Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service;
- b. where aggregation is used in the calculation process;
- c. how entry age is established;
- d. what procedures are used when different benefit formulas apply to various periods of service; and
- e. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

B-3. Attained Age Actuarial Cost Method

A method under which the excess of the Actuarial Present Value of Projected Benefits over the Actuarial Accrued Liability in respect of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between the valuation date and assumed exit. The portion of this Actuarial Present Value which is allocated to a valuation year is called the Normal Cost. The Actuarial Accrued Liability is determined using the Unit Credit Actuarial Cost Method.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service;
- b. where aggregation is used in the calculation process; and
- c. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Note 3: The differences which regularly arise between the Normal Cost under this method and the Normal Cost under the Unit Credit Actuarial Cost Method will affect the determination of future Actuarial Gains (Losses).

B-4. Aggregate Actuarial Cost Method

A method under which the excess of the Actuarial Present Value of Projected Benefits of the group included in an Actuarial Valuation over the Actuarial Value of Assets is allocated on a level basis over the earnings or service of the group between the valuation date and assumed exit. This allocation is performed for the group as a whole, not as a sum of individual allocations. That portion of the Actuarial Present Value allocated to a valuation year is called the Normal Cost. The Actuarial Accrued Liability is equal to the Actuarial Value of Assets.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service;
- b. how aggregation is used in the calculation process; and
- c. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) future Normal Costs.

B-5. Frozen Entry Age Actuarial Cost Method

A method under which the excess of the Actuarial Present Value of Projected Benefits of the group included in an Actuarial Valuation, over the sum of the Actuarial Value of Assets plus the Unfunded Frozen Actuarial Accrued Liability, is allocated on a level basis over the earnings or service of the group between the valuation date and assumed exit. This allocation is performed for the group as a whole, not as a sum of individual allocations. The Frozen Actuarial Accrued Liability is determined using the Entry Age Actuarial Cost Method. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service;
- b. how aggregation is used in the calculation process; and
- c. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) future Normal Costs.

B-6. Frozen Attained Age Actuarial Cost Method

A method under which the excess of the Actuarial Present Value of Projected Benefits of the group included in an Actuarial Valuation, over the sum of the Actuarial Value of Assets plus the Unfunded Frozen Actuarial Accrued Liability, is allocated on a level basis over the earnings or service of the group between the valuation date and assumed exit. This allocation is performed for the group as a whole, not as a sum of individual allocations. The Unfunded Frozen Actuarial Accrued Liability is determined using the Unit Credit Actuarial Cost Method. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service;
- b. how aggregation is used in the calculation process; and
- c. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) future Normal Costs.

B-7. Individual Level Actuarial Cost Method or Individual Level Premium Actuarial Cost Method

A method under which the Actuarial Present Value of each increment of an individual's Projected Benefits is allocated on a level basis over the future earnings or service of the individual between the age at which such increment is first recognized and the exit age(s). The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. Each individual's portion of the Actuarial Accrued Liability should be determined on a consistent basis, usually as the retrospective accumulation of the individual's prior Actuarial Accrued Liability and prior Normal Cost, using the valuation Actuarial Assumptions.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service; and
- b. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, Actuarial Gains (Losses), as they occur, result in amortization credits (debits) which offset (supplement) Normal Cost. Increases (decreases) in Projected Benefits from one valuation date to the next usually produce Normal Cost increments (decrements) rather than Actuarial Losses (Gains).

B-8. Individual Spread Gain Actuarial Cost Method or Individual Aggregate Actuarial Cost Method

A method under which the Actuarial Present Value of each increment of an individual's Projected Benefits is allocated on a level basis over the future earnings or service of the individual between the age at which such increment is first recognized and the exit age(s). The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The Actuarial Value of Assets is deemed to be assigned to individuals on a reasonable and consistent basis; for example, each individual's share may be the accumulation of his or her prior Normal Costs and any prior Actuarial Gains (Losses) allocated to the individual. Actuarial Gains (Losses) are allocated to individuals in proportion to the assigned Actuarial Value of Assets, or on any other reasonable and consistent basis. The Actuarial Accrued Liability for an individual equals the assigned portion of the Actuarial Value of Assets.

Note 1: The description of this method should state the procedures used, including:

- a. whether the allocation is based on earnings or service; and
- b. a description of any other method used to value a portion of the pension plan's benefits.

Note 2: Under this method, the Actuarial Gains (Losses), as they occur, reduce (increase) future Normal Costs.

Note 3: This method has the effect of applying the Aggregate Actuarial Cost Method separately for each individual.

B-9. Projection Actuarial Cost Method or Forecast Actuarial Cost Method

A method under which the excess of the Actuarial Present Value of the sum of Projected Benefit Payments for a specified period plus a funding objective as of the end of the period over the Actuarial Value of Assets is allocated on a level basis over the earnings or service of the group during the specified period, including earnings or service for any future entrants assumed. The allocation is performed for the group as a whole, not as a sum of individual allocations. The portion of this Actuarial Present Value allocated to a valuation year is called the “annual cost allocation.”

Note 1: The description of this method should:

- a. explain the funding objective, and describe any anticipated benefit increases which have been taken into account;
- b. specify the period involved, and any scheduled changes to that period for future valuations;
- c. state the procedure used to allocate the excess and whether the allocation is based on earnings or service; and
- d. state the Actuarial Cost Method to be used to determine future allocations when the end of the specified period is reached.

Note 2: The funding objective will usually be expressed as the Actuarial Accrued Liability as projected to exist under another Actuarial Cost Method at the end of the specified period.

Note 3: Under this method, Actuarial Gains (Losses), as they occur, reduce (increase) the annual cost allocation.

Note 4: Only a Projection Actuarial Cost Method with an Open Group assumption should be so labeled; if an Open Group assumption is used with any other Actuarial Cost Method, the method should be named and the Open Group assumption described.

Appendix II—Pension Actuarial Terminology

Section C—Supplemental Glossary

C-1. Accrued Benefit or Accumulated Plan Benefit

The amount of an individual's benefit (whether or not vested) as of a specified date, determined in accordance with the terms of a pension plan and based on compensation (if applicable) and service to that date.

C-2. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; changes in compensation and Government provided pension benefits; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; characteristics of future entrants for Open Group Actuarial Cost Methods; and other relevant items.

C-3. Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

C-4. Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

C-5. Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability or the Unfunded Frozen Actuarial Accrued Liability.

C-6. One-Year Term Cost

The Actuarial Present Value, as of a valuation date, of all benefits expected to become payable in the future as a result of an event or events expected to occur during a valuation year.

C-7. Open Group/Closed Group

Terms used to distinguish between two classes of Actuarial Cost Methods. Under an Open Group Actuarial Cost Method, Actuarial Present Values associated with expected future entrants are considered; under a Closed Group Actuarial Cost Method, Actuarial Present Values associated with future entrants are not considered.

C-8. Pay-as-You-Go

A method of financing a pension plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

C-9. Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. That portion of an individual's Projected Benefit allocated to service to date, determined in accordance with the terms of a pension plan and based on future compensation as projected to retirement, is called the Credited Projected Benefit.

C-10. Terminal Funding

A method of funding a pension plan under which the entire Actuarial Present Value of benefits for each individual is contributed to the plan's fund at the time of withdrawal, retirement or benefit commencement.