

year is one year's pro rata share of the total amount." This decision for cost-based depreciation was affirmed in 1944 in *Federal Power Commission v. Hope Natural Gas Company* and remains the landmark decision. It ruled that depreciation based on cost would best maintain the integrity of the investment which was the purpose of depreciation accounting.

Purpose of Depreciation

The accounting data of a utility is extremely useful for those individuals interested in understanding more about a particular utility or a generating source, both from the standpoint of understanding the results of operations and setting appropriate tariffs in ratemaking proceedings.

- **Results of Operations** - The capital investment in plant and equipment is viewed as a prepaid expense and a portion of that outlay is systematically recorded as depreciation expense in subsequent accounting periods. The goal is that the revenues generated by the plant and equipment match their usage. Depreciation expense is an essential component in informing management, creditors, investors, and others of the utility's cost of operating the business. If depreciation expense were omitted from the annual net income, the utility's financial statements would be distorted and could result in adverse business decisions.
- **Ratemaking** - The financial accounting for operations is extended into cost of service studies which include all expenses of operations, plus a reasonable rate of return on investment. These costs are apportioned to the customers through rates or a rate structure for classes of customers. The inclusion of depreciation in ratemaking aids in determining the expenses incurred for services by rate class and the corresponding amount of revenues received. Regulators have a high degree of interest in utility depreciation practices because these will ultimately be recognized in customers' rates.

Determining Depreciation Expense

The cash outlay and subsequent operation of plant and equipment is the start of the accounting process for depreciation. The entries to record depreciation recognize the appropriate asset cost in subsequent accounting periods and prevent an improper distribution of dividends to stockholders or a transfer to retained earnings. The steps in determining depreciation expense in a regulated environment are as follows:

1. Estimation of the depreciable assets service lives;
2. Estimation of the net salvage value (salvage minus cost of removal);
3. Selection of a depreciation system that will rationally allocate asset cost over time; and
4. Application of the selected system to the depreciable assets.

See Chapter 4 for an in-depth discussion of determining depreciation expense and accrual rates.

1. Service Life Estimation

The determination of service lives for single assets or groups of assets requires the evaluation of both physical and functional effects on asset consumption. While a review of past retirement experience is good starting place for the life analysis, it should be combined with an evaluation of the future effects of wear and tear, operational directives, regulatory requirements, and future expectations for the assets. While past experience may provide the initial basis for estimates, actuarial and semi-actuarial studies often provide the vehicle for life determination. Actuarial studies require the retirement ages of individual items, which are then plotted to identify a

retirement dispersion pattern and average service life. Regardless of the data source, the average service life determination must include judgment for the effects of expected future events.

2. Gross Salvage Value and Cost of Removal

Utilities are allowed to include in their depreciation rates the estimated costs to remove assets, net of gross salvage. This means that utilities allocate estimated net salvage cost over an asset's life. Salvage value is defined by the FERC as "the amount received for property retired, less any expenses incurred in connection with the sale or in preparing the property for sale."¹ Cost of removal is defined as "the costs of demolishing, dismantling, tearing down or otherwise removing plant, including the cost of transportation and handling incidental thereto."² Cost of removal can be thought of as cost to retire, since some utility property is retired in place. Net salvage is defined as "salvage value of the property retired less the cost of removal."³ Like the estimation of service lives, salvage value and cost of removal are typically based on past experience and adjusted for future expectations. In actual practice, utilities usually experience negative net salvage, indicating that the cost to remove the asset exceeds the salvage value. See Chapter 7 for an in depth discussion of gross salvage and cost of removal.

3. Depreciation Method

There are three main types of age-life depreciation methods: straight-line, deferred, and accelerated methods.

The nearly universal method used by utilities is straight-line. This method is designed to distribute the depreciable cost of an asset in equal amounts over its estimated useful life. Using the straight-line method, the annual depreciation expense is calculated by using the following formula:

$$\frac{\text{Original cost of plant} - \text{Net salvage value}}{\text{Average service life}}$$

The conversion of the expense to an annual depreciation rate is as follows:

$$\frac{\text{Annual depreciation expense}}{\text{Original Cost of Plant}}$$

The deferred method weights the depreciation expense in the later years with lower costs in the early years, increasing over time. It assumes the aggregation of the periodic accumulations in an account, and it models that the interest generated on the accumulation will be enough to cover the remaining cost of an asset at the end of its life. This method is rarely used by today's utilities.

The accelerated methods weight the depreciation expense in the early years with higher cost which tapers off towards the end of life. The assumption is that assets make a greater contribution to revenues during the earlier part of their life, hence the service value expires more

¹ FERC 18 CFR (4-1-12 Edition), Pt. 101, Definition 35, Pg. 368.

² FERC 18 CFR (4-1-12 Edition), Pt. 101, Definition 10, Pg. 365.

³ FERC 18 CFR (4-1-12 Edition), Pt. 101, Definition 19, Pg. 366.