0833

Public Utility

Depreciation Practices

August 1996

Compiled and Edited by

Staff Subcommittee on Depreciation of

The NARUC Finance and Technology Committee

of the

National Association of Regulatory Utility Commissioners

Published by
National Association of Regulatory Utility Commissioners
1201 Constitution Avenue, N.W., Suite 1102
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Washington, D.C. 20044
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The cost of the equipment to be retired should be identifiable directly from the CPR if costs are maintained by unit of property and vintage. Vintage information may be available from work orders or drawings.

Use of one average cost for all vintages may give longer or shorter life indications than what is actually being experienced, depending on the effects of inflation. Rather than use the current average cost for pricing retirements, the assumption may be made that retirements are a certain number of years old, such as ten years. Then the average unit cost at that time in the past would be used to price retirements. For example, the cost can also be determined using published statistics of annual inflation to deflate current costs to the time of installation.

Retirements may be priced on a first-in first-out basis. However, since the plant retired may not always be from the oldest vintages, the cost of retired plant would be understated since inflation would cause increases in the cost of the plant. This understating of retirements will lead to longer life indications than if vintage costs were used.

Reimbursement

A reimbursement is a retirement of property for which the company is compensated at the time of retirement through insurance because of the occurrence of a covered incident, or by public authority, customer, or other party as a result of negotiations wherein the property will be removed or relocated for the convenience of the entity desiring the retirement. In the case of insured losses, the payment received may be different from the original cost of the equipment. Thus, treating the reimbursement as normal gross salvage data in studies may give results that are not typical of the account as a whole because the insurance payment is not a characteristic of the account in general. Therefore, such retirements and the corresponding salvage should either both be included or excluded from the depreciation study. The accounting for removals should be analyzed to identify the apportionment of monies received among an offset to new construction, gross salvage, and cost of removal.

Sale

Property is sometimes retired because it is sold. The sale is made to a similar company for a continuation of service, e.g., sale of pole lines to a municipality. Sales at the end of the life or because the property is no longer useful for normal economic reasons are classified as ordinary retirements.

Transfer

A transfer is an accounting entry which removes property from one account and concurrently reassigns it to another account within the company. The reason for the transfer may be a change in operations such as reclassifying plant from transmission to distribution plant or moving furniture from the general office building to a generating plant. Transfers are not exposed to the forces of retirement at any time during the age interval must be included as an exposure at the beginning of the age interval.

The retirement ratio can be used to depict history or to forecast future activity. These contexts require two differing approaches to the handling of transfers, accounting errors, and adjustments. These two concepts are discussed separately below.

Depiction of History

When determining whether a particular accounting entry is to be included in either exposures or retirements, the criterion is whether the data accurately represent history. The analyst should remember that accurately representing the history of the physical asset may be different from accurately representing the history of the investment. Unusual retirements, or retirements based on outdated accounting methods (i.e., changing of the capitalization threshold), should not be adjusted when the goal is to restate history, as long as those retirements accurately reflect the history.

Conversely, items such as accounting errors, which misstate the history of the investment under study, should be adjusted. For example, assume a retirement in an activity year (year 1) is made from the wrong vintage (vintage A, where the correct vintage is B) and is corrected in a subsequent activity year.

The correction includes the following steps:

1. Excluding the retirement from vintage A in activity year 1 and restating the closing balance in activity year 1 and all subsequent activity years, for that vintage, and

2. Making the retirement in vintage B in activity year 1 and restating the closing balance in activity year 1 and all subsequent activity years, for that vintage.

Forecast of Future Activity

In general, historical data used to forecast future retirements should not contain events that are either anomalous or unlikely to recur. Therefore, in making adjustments to the data, the analyst must consider the purpose of the analysis. Often the same data and the same analysis will be used both as a statement of history and as a basis for forecasting.

A sizable benefit may be obtained for a relatively minor incremental cost if the general principles are adhered to in the initial data collection phase. This is particularly true because the time required to appropriately adjust the data benefits both the current study and all future studies.

Despite the benefits of collecting good data, often the decision is made to proceed with the data "as is." In these instances, the analyst must keep in mind the nature of any transfers,

Fitting with Type Curves

Curve fitting is the process of determining the trend or pattern developed from the known historical facts. Once data have been assembled, an observed interim retirement life table can be developed. This observed curve can be fitted to generalized life curves, e.g., Iowa curves or curves based on the Gompertz-Makeham formula. These curves and curve fitting processes are described in detail in Appendix A, parts 1-3.

The techniques used in curve fitting may be mathematical, graphical matching techniques with type curves, and/or visual inspection. Mathematical curve fitting is advantageous because the interim retirement curve may be based on broad experience bands.

The choice of the curve fitting technique could depend on the ease of handling the data and the ease of interpreting the results. The mathematical techniques may yield significantly better results, compared to graphical matching or the visual inspection process.

The Generation Arrangement

The generation arrangement is applicable even in cases where obsolescence is being experienced and no new installations are made but substantial sums of money are still being invested just to keep the plant. For life span categories the generation arrangement provides a sound basis for determining the average service life and average remaining life.

Vintage remaining lines are developed using an interim retirement rate and the AYFR to compute vintage average life expectancies. These remaining lives are combined with historical experience in the age distribution of the surviving investment, which is derived from actual or computed mortality experience, to develop the average service life.

Tables 10-5 and 10-6 are examples of interim retirement life and generation arrangement tables. The AYFR and survivor curve are based on the estimated retirement schedule in Table 10-1 and the interim retirement rate developed in Table 10-2.

Depreciation account will be related to retirements of plant recorded simultaneously.[2] It is cautioned, however, that this is frequently not the case, with the result being that plant retirements are recorded in one time period and the associated gross salvage and cost of removal are recorded in a different time period. The impact of this timing mismatch can be largely negated by analyzing a band of years, as discussed below. Another point to consider when gathering data for analysis is that changes may have occurred in the composition of plant accounts. For example, the Federal Communications Commission's Uniform System Of Accounts for telephone corporations was revised effective January 1, 1988; and both the title and content of many plant accounts changed.

Once the source of information is established, the analysis of data can commence to determine the past relationship of net salvage to retirements, i.e., net salvage as a percent of plant retired for each of the depreciation categories being studied. Net salvage can be directly analyzed as a percent of retirements. However, in order to obtain a clear understanding of the composition of net salvage and the forces that cause it to change from year to year, generally it is best to analyze gross salvage and cost of removal separately as a percent of retirements. In making this analysis it is common to look at data for bands of years, such as 1988-93, 1989-94, 1990-95, etc. These bands may, or may not, coincide with the bands used in making the life analysis. They should be just broad enough so a fairly smooth trend can be detected, if one exists. If retirements are few or erratic from one period to another, it will be necessary to use a wider band. As a general rule, the greater the retirement activity, the shorter the band necessary for analysis, and vice versa. Also, the shorter the service life, the shorter the band needed, and vice versa. If the band is too long, it may mask any trend. However, with certain long-lived property, such as conduit and buildings, in order to obtain meaningful results it is usually necessary to examine data for a wide band of years, perhaps 20 or 30 years.

In many cases both gross salvage and cost of removal trend in the same direction so net salvage remains fairly steady. Quite often, when plant is removed with the intent of reusing it, the gross salvage is high but because of the extra care required to recover the plant in good condition, the cost of removal is also high. If the plant removed is old or obsolete, the gross salvage is low. In this case however, the cost of removal is also likely to be low since relatively less care is likely to be taken in the removal process.

Past trends should not be the sole guide in predicting future net salvage because they can be misleading. Recognition should be given to changes that may cause deviations from past trends, such as the kinds of materials to be removed in the future versus the kinds of materials that have been removed in the past, or changes in methods of removing plant from the way in which that plant was previously removed. Changes in company policy and environmental regulations can also affect the level of net salvage.

Most analysts are of the opinion that reasonable salvage and cost of removal estimates and forecasts can be made by trending experience and applying informed judgment. They believe it is difficult to justify the expense of detailed analyses. This would certainly hold true

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[2] Retirements, cost of removal and salvage associated with each specific work order or estimate are collected until the project is completed and closed. All amounts are then transferred to the Accumulated Depreciation account together.

in the case of relatively small companies and is probably true for most larger companies as well. In any case it would not be economically justifiable for any utility, regardless of size, to produce indepth salvage forecasts for all categories of plant.

Refining analyses of net salvage includes studies of the relationship between age and the percent of reuse salvage and forecasts of the future price of scrap salvage and labor. The reasons for making such analyses and the desirability of performing them are discussed below.

Because the likelihood of reuse is greater for items that are retired at early ages, the gross salvage realized for property retired at an early age is usually higher than the gross salvage that will be realized over the future life of the remaining property. Book salvage, therefore, may overstate the average salvage realized over the entire life of the property. Mathematical techniques have been developed to examine the relationship of age at retirement to reuse, but they are cumbersome to apply and the results they yield should be carefully interpreted to avoid incorrect conclusions. It is believed that the degree of additional precision that those techniques provide does not justify the necessary work involved and, consequently, they have not been included in this text.

The majority of present day utility plant will not be retired for many more years, and the sale of the retired plant will largely depend upon economic conditions existing at that time. It is, of course, impossible to make an accurate estimate of economic conditions expected to exist at some exact time in the distant future. However, because utility property generally retires gradually over a long period of time, it is necessary only to make reasonable estimates of average conditions expected in the future. For plant consisting of ferrous metals and wood, the junk value is quite low and even if future prices were double or half of what they were in the past, the future salvage percentage would not differ significantly from the past. For plant consisting mostly of nonferrous metals, junk salvage may be quite high. Even so, considering that the significant item is the average of future prices, it is unlikely that a large error will be made by deriving future percentages of junk salvage from past averages or from trends of past percentages. It is important to bear in mind also that the mix of items of plant retired in the past may be different from the mix of items of plant retired in the future, even within the same account or depreciation category. The realized junk salvage from past retirements, therefore, may not be representative of future salvage.

Graphing techniques used to analyze past scrap prices and project future scrap prices can be found in older depreciation texts, including the *1968 NARUC Manual*,[3] but the results may not justify the time and effort involved in making the analyses. Consequently, this type of analysis has fallen largely into disuse. For example, the FCC no longer requires the submission of junk metal weight studies in connection with the depreciation rate represcription process. These techniques have not been included in this text.

It is often stated that future costs of removal must logically be higher than past costs simply because labor costs are constantly on the increase. In general, this may be a true statement but it does not necessarily indicate that the percentage removal cost will increase.

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[3] NARUC Depreciation Subcommittee of the Committee on Engineering, Depreciation, and Valuation, *Public Utility Depreciation Practices* (Washington, D.C.: NARUC, 1968).

requirement studies. The results of analyses from theoretical reserve studies answer many questions about the consumption pattern of plant. However, theoretical reserve studies should not be used to modify the life and net salvage parameters for calculating future depreciation rates. If a theoretical reserve study reflects an inadequate reserve, and the service lives are reduced solely on this basis, a new theoretical reserve study based on the new service lives would indicate not a "corrected" reserve but instead a greater deficiency, calling for even higher depreciation rates. This would not be a correct application of the results of a theoretical reserve study.

Theoretical reserve studies also have been conducted for the purpose of allocating an existing reserve among operating units or accounts. Such allocation is done when either the reserve has not been accumulated in sufficient detail or cannot be determined from utility records.

In recent years, theoretical reserve studies have been used to estimate the theoretically correct book depreciation reserve based upon past and/or future service life and net salvage considerations. Changes in technology and challenges from competition place a greater emphasis on theoretical reserve studies. Periodic comparisons of the theoretical reserves to the actual book reserves and the booking, as depreciation expense, of any reserve imbalance decrease the risk that the original cost of plant will not be recovered during its service life.

The booked consumed service capacity of plant is also expressed by the reserve ratio, which is the book depreciation reserve divided by the book plant balance. A higher ratio indicates a higher consumption of service capacity or life.

For example, the reserve and the reserve ratio, for a single unit, continually increase with each accounting period until the unit is retired. The reserve ratio for a single vintage with a large number of units, however, does not steadily increase. The ratio increases, with some fluctuations caused by the retirement dispersion, until the vintage's age equals its average service life, after which the ratio decreases with the later period retirements until the vintage's units are all retired.

The reserve ratio for an account containing several vintages also does not steadily increase. It may be affected by vintages with differing survivor curve characteristics caused by improvements which lengthen the property's service life. Other factors affecting reserve ratios are inflation and the pattern of growth in vintage installations.

Treatment of Reserve Imbalances

A reserve imbalance exists when the theoretical reserve is either greater or less than the actual reserve. If changes are made to the estimated service life and net salvage, creating a reserve imbalance, a decision must be made as to whether and how to correct the reserve imbalance. Should the imbalance be amortized (debited or credited) to the current depreciation expense over a short period of time; or should a remaining life depreciation rate be used to spread the imbalance over the future remaining life of the plant; or should future depreciation rates be adjusted to reflect the current estimated service life of the plant leaving the decision to adjust the reserve for the future? Further analysis will provide additional information to assist in making these decisions.