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George H. Johnson

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Amortization and Depreciation in Public Service Corporations

By GEORGE H. JOHNSON

In the accounting of public service corporations there is no subject more important and no other perhaps so difficult as the proper provision for the physical deterioration of the plant (depreciation as it is called) together with obsolescence and the amortization of the book cost of limited-term franchises, etc. These may be considered as a group because the principles underlying them are the same. This is also true in varying degrees of the tangible and intangible property represented on the balance-sheets of industrial corporations. Patents are a notable example of intangible property whose limited life must be recognized in any scientific system of accounting. The application of the principles is so extensive that it is rather remarkable that they are not better understood by accountants generally and that in some important fundamentals even the specialists are not entirely agreed. There are still some public-utility accountants who maintain that service value is the only value to consider in a going plant and consequently that as long as maintenance is adequate to keep service unimpaired there can be no depreciation in the property. This is a virtual denial of any replacement requirements. No accountant who entertains that hazy idea of the subject can develop an accounting system which would be satisfactory to the various government commissions and in accord with the prescribed and well-established usage of those commissions which have adopted uniform systems of accounting. What this usage is, particularly in the state of New York, and the philosophy of it may be briefly outlined.

The original public service commission for the first district, as appointed under the law which was enacted in 1907, pursuant to the plan of Governor Hughes, adopted in December, 1908, a uniform system of accounts for street and electric railways, with very similar systems for electric corporations and gas corporations. Those orders were served upon all the corporations under the jurisdiction of the commission and were prescribed from and after January 1, 1909. The accounting provisions regarding the subjects under consideration were essentially the same in the

three systems, and they are still in effect. It will be sufficient therefore to state the prescribed accounting for street and electric railways.

Three depreciation accounts have been provided in operating expenses, viz., depreciation of way and structures, depreciation of equipment and general amortization. Amounts charged in these accounts are concurrently credited to the account, "accrued amortization of capital"—the official title of the depreciation reserve as it appears on the balance-sheet. In paragraph 30, where the term "amortize" is first used in the accounting order, there is added the following explanatory note:—

By amortization of any charge or credit is meant its gradual extinction. The word is broader than depreciation, since the latter is restricted ordinarily to tangible property. The word depreciation also imports more of the idea of fluctuating value and is complicated somewhat with the question of cost of replacement at market prices. Because it is considered unnecessary in connection with the gradual consumption or expiration of life of capital to consider the question of the cost of replacement until the replacement is actually made, at which time the cost of replacement is duly charged to the appropriate account, and because provision is necessary for the gradual extinction of certain charges (such as those for some kinds of capital, those for extraordinary casualties, for discount on debt, etc.), to which the term depreciation does not well apply, it is considered well to use the term amortization in connection with the extinction of such charges and of certain corresponding credits, such as premiums on debt outstanding.

The uniform system requires that each corporation served with the order shall make formal rules of depreciation, embodying expert estimates of the accounting provision necessary to cover wear and tear, obsolescence and inadequacy. If the monthly estimate for such deterioration exceeds the total repairs of the month, the depreciation accounts are debited and the reserve account "accrued amortization of capital" is credited with the excess, and conversely in case of a deficiency.

When capital is substantially continuous, such as tracks, and cannot be satisfactorily individualized, the capital is to be kept in efficient operating condition through repair, and the renewal and replacement of parts thereof are considered repairs. In the case of buildings and other structures capable of being readily individualized, charges to this account must be sufficient to provide at the end of the estimated life a reserve equal to the cost less salvage. When any capital is retired from service the amount (estimated, if not known) originally charged to a capital account in respect thereof is credited to such account with a concurrent

debit, less salvage, to the account "accrued amortization of capital." Any necessary adjustments not thus provided for are charged to "surplus."

The rule for general amortization is as follows:

Charge to this account at the close of each fiscal period and credit to the account "accrued amortization of capital" such amount as is attributable to the period in respect of amortization of intangible capital not assignable to "maintenance of way and structures" or "maintenance of equipment." This includes such matters as amortization of limited franchises, amortization of organization, etc., which shall be based on rule to be filed with the public service commission.

A corresponding rule governs the account "accrued amortization of capital"—in which the concurrent entries are made.

Errors which are most commonly made in the application of these rules show a lack of appreciation of the philosophy of averages and the science of statistics which underlies them. The erroneous ideas to which these errors may be attributed are of several classes.

First: The idea that the rule adopted must be based wholly on the experience of the respondent company and that consequently only an old company with long and continuous records of their physical property can estimate the cost of repairs and the probable life before replacement. This idea results in long delay in the adoption of any rule.

Second: The idea that the rule must reflect the experience of the current year instead of a long average. This idea leads to the annual amendment of the rule.

Third: The idea that a separate rule should be adopted for each class of property, instead of rules giving the average for all the property in each of the great classes, viz., way and structures and equipment.

Fourth: The old idea, still so much in evidence in manufacturing concerns, of using the depreciation account as an equalizer of fluctuating profits—as a reservoir for large profits in good years which can be used for repairs in poor years.

Fifth: The idea that provision cannot be made for events which cannot be specifically foreseen. In public utility accounting the discovery of improved processes and the invention of improved machinery are notable examples. The falsity of the idea is best shown by tables of mortality which give no prediction for any one life, but the assurance that the average will be rather constant.

Sixth: The idea that any rule is good enough so long as something is on the books which can be called provision for depreciation and the opposite idea that a credit balance in the reserve shows the need of a revision of the rule to adjust the figures to the facts.

Seventh: The idea that replacements may be charged to capital account because such expenditures are for tangible property.

Eighth: The idea that new property should either be capitalized or be charged to expenses according to the effect of its installation on earnings.

The erroneous nature of all these ideas is evident enough if we keep in mind the fundamental purpose of depreciation accounting, viz., the maintenance of the property account as summarized on the balance-sheet, so that it will represent approximately the going value of the company's property and so serve as a basis for credit and the price of the company's securities, and also in the case of a public utility as a rate base.

Any accountant who understands this principle and its proper application has one of the essential qualifications for a comptroller or corporation adviser. There are, of course, different kinds of value, and a digression into the discussion of their definitions would be out of place here. It need only be said that a thoroughly competent accountant should have a clear understanding of the fundamentals of economics and so be prepared to set up such accounting reserves as may be required to meet actual and impending changes in going value. Such a reserve, par excellence, is the one we are considering. It should be based on averages in which local experience has the greatest weight, but wide experience also has weight—or is used as a check. It is the recognition of probability based on history—that is, recorded experience. Obsolescence is not on such a mathematical basis as the expectation of total useful life; but the fact that the expectation of life before obsolescence is rather uncertain, even in its average, is no reason why provision should not be made for the co-terminous end of the useful life in accordance with such statistics as are available.

The science of statistics may be defined as the quantitative treatment of history, and accounting is that branch which treats systematically and exclusively of monetary facts and relations of obligation and ownership. From this standpoint, science of

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statistics is the base of accounting generally, and particularly of accounting for reserves—the need for which is purely a statistical problem. Mortality tables for property are in process of growth, but however imperfect and incomplete they may be at present the theory of their application in public-utility accounting has been fully developed and tested by many years of experience.

The uniform classification of accounts adopted by the committee on statistics and accounts of public utilities, and recommended for adoption by state commissions at the annual meeting of the National Association of Railway and Utility Commissioners held at Detroit, November, 1922, contains the following:

Retirement reserve. To this account shall be credited such accounts as are charged to the operating expense account "retirement expense," appropriated from income or surplus or both, to cover the retirement loss represented by the excess of the original cost, plus cost of dismantling, over the salvage value of fixed capital retired from service. When any fixed capital is retired from service, the original cost thereof (estimated if not known, and, when estimated, the facts on which the estimate is based should be stated in the entry) should be credited to the proper fixed capital account and charged, plus the cost of retirement, less salvage, to this account. If the credit balance in this account is insufficient to cover the retirement loss, the excess over the balance contained in the reserve should be charged to account "property abandoned," which see, or to other appropriate accounts.

The amounts appropriated from surplus plus amounts charged to retirement expense should be upon a basis, determined to be equitable according to the accounting company's experience and best sources of information, and should in all cases be sufficient to provide during a period of years a reserve against which can be written off all losses sustained upon the retirement of property for any cause whatsoever.

This rule raises the interesting question: What is an equitable base? Evidently it includes obsolescence.

It has been the usual practice for public service commissions, when specific orders are made authorizing the issue of new funded debt, to require the amortization of discount and commissions on bonds, etc., sold, as well as payments for limited term franchises, by the establishment of a sinking fund or equivalent reserve, which is credited with a fixed amount each year plus interest upon all prior payments—the concurrent debit being a deduction from income. The annual or semi-annual payment or reserve is calculated so that the total amount to be amortized will be accumulated at the expiration of the life of the bond or franchise. The effect of this rule is to make the credits to the reserve, as well as to the sinking fund, much larger at the end of a long life than they were at the beginning, although by the sinking-fund

method the annual charge to income is generally constant. There are several reasons why later credits to a depreciation reserve should be the heaviest. The base of one reason is physical and of another financial. The service value of property decreases progressively, that is, the deterioration for which the depreciation reserve is a provision increases more rapidly with age; therefore it is equitable that the annual credits to the reserve should likewise increase. The other reason is financial. When a reserve is used, instead of a sinking-fund, the reason is generally economic. The use of the money for capital purposes is worth more to a growing company than the interest which would be received on a sinking-fund investment; therefore the company can well afford to credit to the reserve each year interest upon all prior credits in addition to the annual fixed credit. If the company is earning a fair return upon the capital invested it will be easier for it to bear the required burden upon its income in the later years than it was the first year.

In the case of the amortization of bond discounts, payments for limited term franchises and intangibles generally, only financial reasons are applicable, but these are usually regarded as adequate and decisive. But for income-tax accounting the straight-line method has been officially approved. In mathematical language, the accumulation of sinking-fund or reserve credits at the end of each period makes a geometrical progression or curve which is convex downward—the rate of interest being the ratio of the progression. When the interest rate vanishes the curve becomes a straight line whose angle with the base represents the fixed rate of payment on the amount to be amortized. Another method of sinking-fund amortization equalizes the periodic credits so that the charge to income is constantly decreasing by the accruals from prior payments. This is represented by a curve which is concave downward; it is a method which, for the reasons given, is little used.

After the public service commission for the first district, New York, had been in existence fourteen years a compilation of its capitalization orders to the street-railway corporations of the district, that is the city of New York, showed that forty-two such orders and resolutions had been adopted requiring amortization in one form or another over a period which had not been completed. These orders were directed to eighteen different

companies, and each order generally stipulated either the sinking-fund or the reserve method of making a definite annual provision for amortization to be completed at a fixed date. Either method serves to correct the inflation of the surplus and so far to prevent the distribution of unearned dividends. Regarding the phraseology used in these orders it may be noted that twenty-one of them stipulate "an amortization fund," thirteen require "a sinking fund," five require "a charge to income and a credit to a reserve," six require "amortization according to the prescribed system of accounts," three require "a depreciation charge," and one requires "an annual charge to surplus." In seven cases, it will be noted, more than one of these phrases is used.

In actual practice an interesting question arises at the very beginning of depreciation-accounting for corporations which have been operating without any such accounting. It is evident that a rule which would have been proper when all the property was new, will be inadequate at any later date to provide for all the retirements. This may be remedied in either one of two ways: First, the amount which would have accumulated in the reserve, if it had been established at the beginning of operations, may be charged to surplus and credited to the reserve; second, the reserve may be made applicable (a) only to property installed after the date of making the rule effective—other retirements being charged to surplus—or (b) as regards property installed before that date, but retired later, its book cost, less salvage, may be charged partly to surplus and partly to the reserve in proportion to its useful life before and after such date.

Whether (a) or (b) is used depends upon the data on which the rule is based. If the rule is based on the whole life of the property, method (a) is used; if it is based on the estimated life after establishment of the rule, then (b) is used.

Other interesting questions have been discussed—particularly as the result of war inflation, changing prices and costs of replacement. The correct answers to all such questions are based on a principle which must never be overlooked, viz., the fundamental purpose of depreciation accounting is to prevent any wide and permanent gulf between the balance-sheet figures of fixed capital and the actual value of the property they represent. It is such a gulf—particularly one that is constantly increasing—that is to be avoided, and not a gap; because the idea that the balance-sheet

figures and the corresponding values can be kept together, or in mathematical relationship, is quite impracticable. The idea is a good ideal to keep in mind, but—like mean sea level—it can be realized only to be lost in continuous fluctuations. To keep actual value fixed is no more practicable than to keep a chip floating on the ocean at mean sea level. But while the surface of the sea can be depended upon to fluctuate about a mean level, values have zero as their only limit.

The plan proposed of revising from time to time the balance-sheet figures of fixed capital, to represent actual values as shown by appraisements, has much to recommend it, but it also has such serious disadvantages and dangers that it is not likely to be adopted systematically. The great object lesson in this kind of work is the valuation of the interstate steam railroads of the United States by the interstate commerce commission. When this work is finished and accepted, if that time ever comes, the expense to both corporations and the government will have been so great, and the date of the appraisal will be so old, that similar work will not be encouraged. And yet whenever an appraisal is made which shows the actual value of the fixed property to be very different from its book value the expediency of revising the latter should be seriously considered.