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Depreciation in Telephone Utilities*

BY WADE KURTZ

In no class of public utilities is there a more fertile field for speculation as to what depreciation includes and the annual amount to be charged against operating expenses to protect sufficiently the capital investment, while doing justice to the public interests, than in the telephone companies. The differences of opinion and practice vary all the way from the complete elimination of accrued depreciation as an operating expense to the setting aside of a reserve amounting to an annual charge of as high as ten per cent. of the plant value in certain isolated cases. In fact, the whole question of depreciation in telephone utilities is so debatable that no one can say that a certain rate of depreciation is correct under certain conditions.

Aside from errors in accounting principle and the elimination of depreciation for the purpose of manipulating the income account, there are numbers of very good and sound reasons for the various charges for accrued depreciation among telephone companies, the most important of which are the following:

I. The climatic conditions are so variable in different localities, and the plant being so largely exposed to the elements, there is an entirely different result for each locality.

II. The telephone business is so young, and has had such a remarkable growth, that it has not had sufficient time to give results upon which the courts, engineers and accountants can base a definite and final opinion.

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III. One company may have its plant largely of overhead construction, while others, especially in large cities, would be entirely underground. The latter being more permanent reduces the rate of depreciation.

IV. A plant situated so that it is in danger of extraordinary casualties, such as the flood loss in the spring of 1913 along the Ohio and Miami rivers, causes very excessive depreciation.

V. The depreciation is greater in smaller companies than in the larger ones, because as a rule the plant is not so well maintained and is constructed with cheaper and shorter lived material.

VI. The risk and contingencies are greater in a small plant than in a large one, thus causing greater depreciation, as there is not the average a larger company obtains. This is somewhat analogous to carrying one's own insurance instead of through an insurance company.

VII. In a small company the loss on account of inadequacy is much less than in a large and growing city. Stagnation of growth in a locality decreases depreciation because there is no inadequacy.

VIII. There is a wide difference of policy in the various telephone companies in their arbitrary distinctions between maintenance and depreciation charges. When maintenance charges are high, depreciation is decreased, and when maintenance is low, the depreciation is higher.

IX. As telephone plants tend to reach their final peak of stability, both depreciation and maintenance charges are gradually decreasing.

X. The quality of service which it is necessary to maintain affects depreciation. In some concerns where the very best service is not maintained, the plant can depreciate to the limit before replacements are necessary. In other localities this condition would not be permitted.

It can readily be seen that considering the foregoing reasons and their possible combinations, there is a large field for variation in the rates of depreciation used by the different companies. A large company may have as many variations in rates as it has exchanges, but it has the advantage of averaging the expense over its entire plant, and it is so handled on the general books for accounting purposes. Subsidiary records should be kept, however,

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showing the depreciation reserve and all charges against it by the various exchanges. This is essential for statistical purposes as well as for rate-making purposes before the utility commissions.

ELEMENTS OF DEPRECIATION

Inasmuch as the setting up of a depreciation reserve is intended to level the expenses by apportioning to each period its just share of the expense, the tendency seems to be to broaden the meaning of depreciation by including as charges against the reserve items which are not strictly the result of wear and tear but do result in a loss of plant values. These various elements of depreciation which are to be considered in arriving at a just rate in the telephone utilities are as follows:

- I. Gradual lessening in the value of the plant until it arrives at the normal value.
- II. Renewals and replacements.
- III. Extraordinary repairs.
- IV. Obsolescence.
- V. Inadequacy.
- VI. Municipal requirements.
- VII. Cost of recovering salvage and the removing of retired or abandoned properties.

All the above are causes for the perpetual decrease in plant values, and proper recognition must be given them before correct profits can be ascertained.

NORMAL VALUE

A vital phase of telephone depreciation, with which the average person is not familiar, is the normal value toward which an average plant tends to gravitate, beyond which the loss due to wear and tear does not go. In other words, the plant of a telephone company, in order to give efficient service, must be maintained on the average at about eighty per cent. of its original cost. When the plant is allowed to depreciate to approximately seventy-five per cent. of its cost, engineers seem to agree that the service is unsatisfactory, and, should the plant be allowed to decline much below that average, it will soon arrive at a point where the rendering of service is impossible and revenues will cease. It seems, therefore, that aside from a reserve for contingencies, a telephone company has no right to create a depreciation reserve for any larger amount than the difference between the original cost and

the normal value of approximately eighty per cent., which would be twenty per cent. of the cost of the plant. After this decrease in the average value of the plant has been provided for, the only just charges for depreciation would be for current renewals and extraordinary items.

The reserve thus set aside, while the plant is settling down to its normal condition, will never be used for replacements, and its only possible use is to keep the original investment intact. There are two possible dispositions of this reserve:

I. If there are extensions of plant needed, it can be used for that purpose.

II. If no extensions are necessary, the fund can be distributed to the stockholders as a part return of their capital investment.

In business practice the second method is never intentionally followed, although in many concerns it has been done unintentionally. As a rule, it is invested in plant extension, thus avoiding the necessity of borrowing funds for that purpose and at the same time maintaining the original investment.

RENEWALS AND REPLACEMENTS

While a large plant as a whole, if properly maintained, never depreciates below its normal value, it must not be overlooked that in spots the plant is continually decreasing in value until it must be renewed or abandoned, and at some time the whole plant will be replaced either in kind or by the substitution of a new unit, and provision must be made for this expense. The net loss will be the difference between the original cost of the plant and the cost of removal, less the salvage, which in the telephone business is a very large and important item. A great deal of the material recovered still has sufficient life remaining to warrant its being placed in stock and re-used in later construction of plant.

EXTRAORDINARY REPAIRS

The name "extraordinary repairs" is to an extent a misnomer, and as a result there is considerable confusion in the telephone companies as to just what this term is intended to include. The interstate commerce commission has defined the charges under this heading in a general way as follows:

The depreciation accruing in property which cannot be readily individualized, such as pole lines, wires, cables or other continuous structures, where expenditures for repairs or replacements of individual parts ordi-

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narily are not actually made until the later years of the life in service of such property, and when made may, therefore, be classed as extraordinary repairs.

In the *System of Accounts for Telephone Companies*, under the explanation of "repairs defined" the commission gives a more detailed statement of these charges as below:

I. Restoring to an efficient or proper condition buildings, structures or other units of property which have deteriorated.

II. Substituting, in order to maintain normal efficiency, new parts for old parts of continuous structures, such as pole lines, cables, wires, conduits, etc., where such substitutions do not amount to a practical replacement of any considerable length of such continuous structures.

III. Restoring the condition of property damaged by storms, floods, fire or other casualties.

IV. Recovering salvage and removing retired or abandoned property in connection with the above work.

It can readily be seen that, in the telephone business where the money is continually being put back into plant, this item of extraordinary repairs becomes most important.

The reason for not using the same accounting procedure for these charges as that in the case of other replacements—that is, construction and depreciation reserve accounts direct—is to avoid the inflation of the plant values on the books owing to the large amount of piecemeal re-construction. It is well known that building a plant by small units at a time will cost more than construction work on a large scale, but the nature of the telephone plant makes it imperative that a large part of the renewals be done piecemeal in order to maintain efficient service. It should not be forgotten, however, that the increased cost owing to piecemeal re-construction may be partly offset by the lower overhead charges on the work, such as interest on construction, engineering, etc.

This method is quite out of the ordinary routine of accounting because all extraordinary repairs are reported as a maintenance charge, and so entered upon the general books with the ordinary repairs, but at the end of each month a correcting journal entry is made crediting the total extraordinary repairs to account No. 611, "Repairs charged to reserves," and concurrently charged to account No. 102, "Reserve for accrued depreciation." On an

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expense statement the item would appear as an addition to maintenance and afterwards be deducted as below :

Supervision of maintenance	\$13,606.95
Repairs of aerial plant	80,236.11
Repairs of underground plant	2,534.88
Repairs of central office equipment	17,263.04
Repairs of station equipment	18,513.11
Repairs of buildings and grounds	1,157.54
	<hr/>
Total repairs	\$133,311.63
Less repairs charged to reserve	32,666.41
	<hr/>
Net current repairs	\$100,645.22

The title "extraordinary repairs" is misleading because a large part of the charges represents expenditures of an ordinary nature.

OBSOLESCENCE

Owing to the swift and constant progress of the telephone science in the past, obsolescence has been an item of considerable importance in its relation to depreciation, but within the past few years engineers and accountants have given it little consideration. It is, however, an element of depreciation which should be reasonably considered, as developments are continually taking place. The automatic and semi-automatic switchboards, as well as other improvements, are meeting with popular approval, but it is reasonably safe to assume that the present switchboards and other plant are efficient enough to warrant their use until the average life has expired. The present investment in switchboards is so great that a universal change to the automatic or semi-automatic would cause a tremendous loss to the telephone companies.

In considering obsolescence when arriving at a fair rate of depreciation, it would seem proper to eliminate any loss of magnitude, and should such a loss later occur, the interstate commerce commission would without doubt grant permission to capitalize the amount, and then amortize it over a period of years as described under the heading of "Extraordinary casualties and unanticipated reconstruction" in the commission's system of accounts.

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INADEQUACY

Inadequacy is one of the depreciation elements which is real and important, because it is continually being met today, more especially in the larger cities, where it is practically impossible for the commercial engineers accurately to forecast the growth of cities and more particularly the section of a city which will have an abnormal growth.

As an illustration, during the past few years the cities which were affected by the war orders have had a remarkable growth, and the telephone companies in many instances have been absolutely unable to meet the demands for telephones owing to the inadequacy of their plant. This has necessitated the removal of the old plant and a replacement with much larger units, the expense of which should be borne by the depreciation reserve. The anticipation of inadequacy always carries with it the hazard of building a larger plant than will be needed, and this also results in a loss of profits. Inadequacy is an element which is difficult to deal with, and good business judgment is about the only standard that can be taken in its consideration.

MUNICIPAL REQUIREMENTS

The interstate commerce commission recognizes that telephone companies are frequently put to a large expense by changes in popular demand or public requirements, and has included these charges in its definition of depreciation. This expense would include such losses as are caused by a city ordinance requiring the burial of wires in underground conduits, re-location of conduits to make room for subways, re-location of plant from one side of the road to another, etc.

COST OF RECOVERING SALVAGE AND REMOVING RETIRED OR ABANDONED PROPERTY

Inasmuch as a depreciation reserve is an accounting expediency intended to spread the plant expenses, it is proper that the interstate commerce commission should provide for the cost of recovering salvage and removing retired or abandoned property by including it as a part of the estimated expense for depreciation when setting up the reserve. These expenses are continually occurring in the telephone business and over a period amount to a large sum. The cost of removing plant taken out of service should include freight and cartage on the material

recovered. The cost of removal can no doubt be justified as a charge against depreciation reserve by considering that if the plant were not removed it would be abandoned, and thus become a charge entirely against the reserve.

When these charges are not provided for in a depreciation reserve, they should be charged as a maintenance expense under repairs.

METHOD OF COMPUTING THE DEPRECIATION RATE

The basis for arriving at a rate of depreciation is a life table of the various classes of telephone plant, of which there are about twenty, and such a table would contain the following information:

Class of plant.

Life in years of each class.

Net salvage in percentage of first cost.

Wearing value in percentage of first cost.

The life of any particular class of plant is an engineer's best estimate and is, therefore, approximate. By taking the book values of each class of plant and figuring the depreciation in accordance with the life table, a composite rate of depreciation is obtained.

DISTINCTION BETWEEN EXTRAORDINARY AND ORDINARY REPAIRS

In no phase of telephone accounting is there a more unsatisfactory condition than in the distinctions made between ordinary and extraordinary repairs. Telephone accountants are inclined to give general instructions as to classification of expenditures such as are given by the interstate commerce commission. As the employees in the field make the classifications, this policy has resulted in the shifting of the burden of decision from the shoulders of those who ought to know and decide to those employees who know the least about the distinctions.

So far as material is concerned, the issue appears to be clear-cut, as all short-lived parts are a just charge against ordinary repairs. They would include such items as the following:

- Cords,
- Fuses, carbon blocks, heat coils,
- Resistance coils,
- Switchboards, lamps and caps,
- Switchboard resistance lamps,

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Jack sleeve springs,
Plugs,
Relay parts,
Ringing and listening key parts,
Switchboard number plates.

There can be very little material, aside from these short-lived parts, which can be charged as an ordinary repair, and the vast amount of repair expense consists of labor and expense for the following among other purposes:

- I. Cleaning and care of switchboards, main and intermediate distributing frames and central office apparatus.
- II. Cleaning and repairing removed bells, back boards, carbon blocks, protectors, etc.
- III. Cleaning and adjusting apparatus.
- IV. Cleaning subscribers' station equipment, including cleaning and inspecting booths.
- V. Adjusting relays and other parts of central office equipment.
- VI. Inspecting and cleaning manholes.
- VII. Testing cables for electrolysis.
- VIII. Repairing defective cable splices.
- IX. Coiling, sorting and splicing wire in stock.

The foregoing are merely indications to show that repairs do not refer to renewals, excepting parts such as have been listed, but are intended to cover labor and miscellaneous expenses used for keeping up the operating efficiency of the plant.

A telephone plant is composed of a multitude of small, delicate and expensive parts, which are included in the plant values upon which the monthly charge for depreciation is made, and as these parts are continually being replaced piecemeal, it is obvious that over a period of years a large part of the plant could be replaced in this manner. Persons unfamiliar with the telephone business and many in the business do not realize the magnitude of these renewals over a period of time, because they are individually small in both size and value.

These comments refer to such renewals as cross arms, insulators, relays, jacks, etc., which should be charged as extraor-

dinary repairs. This means that they will be charged against the depreciation reserve, together with the labor and expense consumed upon the work.

To state that a renewal of any long-lived part is a just charge against depreciation seems to be meeting the issue squarely, so that the employees can make a positive distinction instead of compromising as at present.

In some instances it would be necessary to make arbitrary distinctions. For example, in replacing wire, the limit of demarcation could be from one pole to another. The labor and expense would follow the same classification as the material used.

GRADUAL DECREASE IN DEPRECIATION AND MAINTENANCE

In attempting to arrive at a fair rate of depreciation for a telephone company at the present time, too much emphasis should not be placed upon the experience of telephone depreciation in the past, because both maintenance and depreciation have a tendency to be on the decrease. The decrease in repair and renewal charges and increase in life of the plant are caused by the average plant's taking on a more permanent and standard character than in the past. For instance, in all the larger cities underground construction is continually being increased, and the plant is not, therefore, subject to sleet storms, which have been the cause of tremendous losses in outside plant.

DEPRECIATION ON PURCHASED PROPERTY

Many large telephone companies are composed of purchased small companies, which when purchased are appraised at the present or depreciated value, so far as the plant is concerned, which is the only amount that can be capitalized in the plant accounts, the difference between the cost value and the appraised value being charged as intangible capital. It is apparent, therefore, that a telephone company soon arrives at a point where it has two values on the general books so far as the plant is concerned: constructed plant at cost value and purchased plant at depreciated value. In a few years there will be a further confusion by extraordinary repairs having been made on the property purchased. As in the telephone business the plant soon loses its identity so far as cost is concerned, when the time arrives for the purchased property to be renewed there is a tendency to forget the value at which it was placed on the books and to

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credit plant with the same value as properties constructed. This has the effect of charging the depreciation reserve with more plant than was originally capitalized.

This is an error of principle easy to make, and the only method of avoiding it seems to be when a plant is purchased to capitalize it in the plant accounts at the original cost figure and set up a reserve for the depreciation. This would have the accounting effect of capitalizing the plant purchased at the appraised value, and when the plant is retired there should be sufficient reserve to take care of the plant retirement on the same basis as all other plant. In order to follow this procedure permission of the commission must be secured.

EXTRAORDINARY CASUALTIES AND UNANTICIPATED RECONSTRUCTION

When an extremely large loss is experienced, for which no provision has been made in the depreciation reserve, the commission has allowed the privilege of carrying the charge as a deferred asset and amortizing it over a period of years, providing the consent of the commission is asked. As an illustration of such a loss in plant value, should the city of Chicago decide to build a subway, it would compel the Chicago Telephone Company to reconstruct its conduits, and would necessitate a large loss.

DEFERRED MAINTENANCE

In many telephone companies it frequently happens that current repairs cannot be made for financial reasons, which is one way of stating that repairs are allowed to accrue in the same manner as depreciation. In order properly to reflect such a condition on the income statement, it is necessary to charge maintenance with the estimated amount of such repairs and credit a reserve entitled "deferred maintenance." Otherwise, the expenses for such a period would not represent the actual operating results.

COST OF PLANT WHEN RETIRED

A great difficulty in the telephone business is to ascertain the original cost of plant when it is retired in order to credit fixed capital with the proper amount. It is a comparatively simple accounting problem to keep the exact cost of plant when going into service, but, as soon as plant is completed and placed in the fixed capital accounts, it loses its identity; and in later

years, when the same plant is retired, it is practically impossible to find the cost of it from the plant records, with the exception of a few large units, such as switchboards and buildings. This condition has led to the use of a somewhat modified replacement figure for the retirement of plant, which is wrong in principle, because it does not take into consideration the varying conditions of capitalization, such as the cost of labor and material. What should be done is to prepare unit costs for periods during which the costs of construction are approximately the same and use these displacement figures for the estimated period when the plant will be retired.

Another difficulty is to record all the plant retired so that it will be reflected on the books. This applies largely to outside plant. For instance, in the Ohio river flood many miles of pole lines were destroyed, and to obtain the displacement figures, the only possible method was by an engineer's estimate, which was, of course, approximate.

ACTUAL LOSS ON PLANT RETIRED BY CASUALTIES

An important feature to be kept in mind when calculating the loss by sleet storms, floods, etc., is that the real loss to the company will be only the unexpired life of the plant which is destroyed. If a pole line has an average life of, say, ten years, and the line is destroyed by storm at the expiration of five years, the actual loss will be only the unexpired life of five years, or half the original cost. This point is self-evident, but is frequently overlooked in practice.

DEPRECIATION ON MATERIAL RECOVERED

On all salvage recovered there is a certain amount of accrued depreciation, but it is placed in the material account at the cost figure as a matter of accounting expediency. It is manifestly impossible to take the salvage in at the depreciated value, because there would soon be a stock record of all items priced at different figures. In the telephone business salvage is a very large item, and at first this would appear to be a serious error of accounting, but in fact it is not, because while the material was being used in the plant the depreciation reserve was being set up each month to cover plant depreciation, and when salvage is taken out of plant and placed in the material account, there is set aside sufficient reserve to offset the decreased value of the salvage.

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It is to be remembered, however, that this method overstates the material account to the extent of the accrued depreciation.

TRANSFER OF SUPPLIES

In a large plant consisting of many exchanges, there is a continual process of exchanging supplies from one exchange to another, which has no bearing on the exchange conditions unless some of the supplies have had service and are depreciated in value. For instance, if one exchange had used a switchboard for five years, and then had replaced it by a new one, the old one being transferred to another exchange, it would be unfair that the second exchange should stand the entire depreciation when the switchboard was junked. When such transactions occur, a transfer report should be made giving each exchange the just proportion of the depreciation charge. On smaller items this is hardly worth while, but on large units it should be considered for statistical and rate making purposes.

STATION REMOVAL AND CHANGES

One of the largest expenses of the telephone business is the loss due to station removal and changes, which also entail a large loss in the plant values. This loss is not considered as depreciation, but is handled separately under current maintenance. The plant loss is due to the drop wires, inside wiring and interior block wires, which are abandoned on account of being taken out of service when a station is removed. Should an abandoned station be reinstalled, this part of the plant would again be taken up as a fixed asset upon the books of the company.

Under this method there is always a large amount of the plant owned by a telephone company which is not reflected in the fixed capital accounts but is a contingent asset to be taken up on the plant records if the stations are re-used.

STABLE, GARAGE AND EQUIPMENT DEPRECIATIONS

The depreciation on the stable, garage and equipment should be carried as a separate reserve, as these items are of a different character than the telephone plant proper. A separate rate for each class should be used in arriving at the annual charge.

REALIZED DEPRECIATION NOT COVERED BY RESERVES

In past years many telephone companies failed to set up a reserve for accrued depreciation, and when the uniform system of accounts was established, January 1, 1913, the interstate

commerce commission provided for this by creating account No. 413, "Realized depreciation not covered by reserves." All realized depreciation—that is, plant taken out of service—for which no reserve had been created up to January 1, 1913, should be charged to this account. It is an accumulating account for the year, and at the end of the year should be charged against surplus.

It can readily be seen, therefore, that a concern which did not provide for depreciation before January 1, 1913, and did so after that date, when it displaces plant, will have a gradually diminishing charge against this account and an increasing charge against the depreciation reserve. The following method of arriving at this distinction between the two accounts has been approved by the commission:

<i>Year</i>	<i>Per cent. of current displacements charged to reserves</i>	<i>Per cent. of current displacements charged to account No. 413</i>
1913	5%	95%
1914	10%	90%
1915	15%	85%
1916	20%	80%
....
1931	90%	10%
1932	95%	5%
1933	100%	0%

The above apportionment is worked out upon a twenty-year life and an annual depreciation rate of 5%.

The use of this account is left somewhat to the discretion of the company, but when used on the basis described above it is inclined to work a hardship upon the corporation, as in the early years it doubles the provision necessary for depreciation by making one charge to current operations for the current accrued depreciation and another against surplus for the realized depreciation not covered by reserves. Unless a company has an exceptional net income, the provision for this account is quite likely to cause a deficit and at the same time set up a large reserve which will never be used.

This condition could be overcome by decreasing the annual rate of depreciation, but this is inadvisable on account of the precedent established by using a rate which is lower than the actual rate, especially for rate making purposes.

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“Depreciation is not a matter of formulas, but there must be a reasonable judgment, having its basis in a proper consideration of all relevant facts”; and in its final analysis, what should or should not be charged against depreciation reserve depends entirely upon what the reserve is set up to cover. At the very best, the fixing of an annual rate of depreciation is an estimate, and as telephone accounting becomes more accurate greater emphasis should be placed upon the actual results as shown by the records in arriving at the rate of depreciation.