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Depreciation in the Lumber Industry *

BY A. L. ANDRUS

In considering depreciation one usually has in mind a single unit, such as a building, a machine, an automobile or some object that can easily be conceived by the mind, to which may be allocated a rather definite period of usefulness based upon experience with other similar units. It is a simple matter to provide for the depreciation of one unit by dividing into the cost the number of years of useful life and by charging the operations with the amount so obtained as representing the annual depreciation of the item. The matter becomes a little more complex when a number of different machines, installation costs and possibly a power plant are charged into one account for which it is necessary to determine the annual depreciation. Still, by analyzing the account and applying the same principle to each separate unit we can determine the total annual charge.

This general plan is followed by accountants and we are all familiar with it. It is true that obsolescence must be taken into consideration, as well as the salvage value at the end of the economic life, but these factors merely modify the basic plan to which I have referred. It is not intended, however, to discuss here all the aspects of depreciation, but to confine the remarks to a few features which have arisen in the lumber industry.

In the Pacific northwest lumbering is the chief industry and will no doubt continue to be so for a number of years to come. Owing to the large size of the trees and the mountainous character of the timber areas, lumbering operations are conducted in a manner totally different from that followed in the east and the south, as well as on a much larger scale in many cases. For these reasons, the experience of the eastern and southern mills can not well be applied in this district. The machinery and equipment in a modern plant cost relatively large sums and the annual

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charge for depreciation is a matter to be seriously considered, especially in an industry where the supply of available raw material is limited. Whether the enterprise be a logging operation consisting only of cutting the trees into logs and transporting them for sale to the sawmill; a log-buying mill which confines its operation to sawing into lumber logs which it has purchased from loggers, or a complete operation including both logging and lumber manufacturing, the depreciation charge must be considered.

The depreciation of the sawmill alone should not be very difficult to determine. It is well to consider, however, that a large proportion of the cost is in the buildings, platforms and yards, and that the company's own product and employees' labor go into these costs. It is also true that buildings and platforms require frequent and extensive repairs and replacements because of hard usage. The management is prone to omit these necessary expenditures during bad years and to catch up during good years, and also is often careless in distinguishing between ordinary repairs and actual replacements. It is hardly necessary to say that the amount of repairing that has been done to structures of this character has a definite relation to the amount of depreciation that has been sustained.

The depreciation, or rather the economic life, of a log-buying mill is often dependent upon the amount of timber in its proximity. Many of you are probably aware of the fact that the timber section of the treasury department estimated that log-buying tidewater mills on Puget Sound and on the Columbia River had an economic life of but sixteen years from March 1, 1913, solely because of the probable exhaustion of timber available to them. Many income-tax cases were settled by providing for depreciation on that basis. While we do not expect to see all such mills go out of business in 1929, it is a fact that some of them have already closed and the others do not have a very definite future. Failure to provide for a situation such as this may mean that a company which has invested a considerable sum in a mill may operate and show profits for a number of years, as long as it is possible to get logs from the vicinity. As soon, however, as the accessible timber has been cut and the only supply is more difficult of access, the cost of the logs will become so high that the company may have to cease operations although it has a relatively large balance in its plant account representing a plant that has no value in its present location. This factor must

be taken into consideration in determining the rate of depreciation of the log-buying mill.

When we consider depreciation of the logging railroad and equipment of the logger, or of the complete lumber company which owns its own timber and logging equipment and operates its own sawmill, we are faced with an unusual situation. It was a simple matter in the earlier days of lumbering in the northwest to build a sawmill almost anywhere with timber all around it and to take off the adjacent timber, get it to the mill and cut it into lumber. This has been done to such an extent that all the timber fringing Puget Sound, the Columbia River and most of the railroads has been cut off. Many of the lumber companies which are now in existence have purchased large areas of more remote timberland and have constructed mills at some point at which the timber will be accessible, as well as providing rail or water shipping facilities. Logging railroads have been built into the tract and will eventually be extended to take off all the timber on the tract. It is easy to see that the first timber which is cut will be that most easily reached with the least expenditure for logging railroad and equipment, and that the last timber to be removed from the tract will be that which is reached only after the maximum amount has been put into the logging railroad and equipment. It is also evident that the cost of transporting workmen and supplies will increase as the sphere of operation becomes more remote and that there will be a tendency toward increasing costs of all kinds. Thus, the modern lumber operation faces a constantly increasing cost of its raw material. This condition, which is quite different from that of any other manufacturing enterprise, should receive careful consideration. Would it be proper to commence paying out in dividends all the profits realized in the first five years' operations when the company has a tract of timber which is sufficient for a twenty years' supply, but when the cost of getting the logs will increase from year to year? If this is done, will there be any profits during the last of the twenty years? Logging railroads which are being built at the present time are expensive and much of the territory into which they are being built is more or less mountainous, generally becoming more mountainous as the road is extended. The cost of the railroad required to log enough timber for the first five years' operations may not be one tenth of the total cost of the railroad that will be required to log the entire tract, and as the railroad is extended from year to

year additional equipment will be required because of the greater distance from which the logs must be transported.

In the ordinary manufacturing enterprise, we usually have nothing to consider except raw material bought on the open market; the cost may rise or fall with the law of supply and demand, but is just as apt to be lower during the next ten years as it is to be higher. The lumber manufacturer, however, is faced with the fact that while he already owns his raw material, the cost of getting it to his mill, that is, a further cost of the raw material, will increase from year to year without fail; and while it may be possible for him to show a very satisfactory profit in the first year by cutting the most accessible timber, is it safe for him to consider that this is all profit and that similar results may be expected in succeeding years? Without going into the question of how high the price of lumber might go as an offset to the increasing costs to which I have referred, I think it is only safe for us as certified public accountants to consider the present market price of lumber and its relation to cost.

To present a little more clearly the situation which I have tried to outline, let us assume, for illustration, that a company is formed, acquires a tract of timber ten miles square and builds a sawmill in one corner of the tract. The timber on the tract is estimated to supply logs for the operation of the mill for twenty years, and it will require the construction of one mile of main-line logging railroad the first year and an additional mile each succeeding year to get all the timber on the tract to the mill and to cut it.

Let us also assume that the cost of constructing the logging railroad will average \$10,000 a mile and that the company constructs the first five miles of logging railroad before commencing any of its operations. At the end of the first year we should then find in the accounts an investment of \$50,000 in logging railroad. With the knowledge that it will take twenty years to log off the tract of timber we could then establish a depreciation rate of 5 per cent. per annum and charge against the first year's operations \$2,500 for depreciation of logging railroad. If we look ahead, however, we shall find that at the end of the twenty years there will be an investment of \$200,000 in logging railroad, a considerable proportion of which has been on the books but a short time. If the company had continued during the twenty years using a rate of 5 per cent. for depreciating its logging rail-

road, there would have been a constantly increasing annual charge for depreciation, but at the end of the period there would remain a large balance in the asset account representing a railroad for which there was no further use. This would also apply to the constantly increasing amount of logging equipment which it would be necessary to acquire during the extension of the operations. I am assuming that the cost of the spur lines which are built from time to time as feeders to the main line of the logging railroad have been written off as the timber tributary to them has been cut out. It is evident that the ordinary rules for providing for depreciation will not fit the situation which I have described. In the first place we do not have the full cost of the plant that is required to complete the operations, and in the second place when the operation has been completed the plant has no value, for there is no more raw material.

In order to arrive at the proper annual depreciation charge, there is a method which I think is logical and applicable to the conditions I have described. The method is as follows:

Before commencing operations, the company should obtain through its engineering department a careful survey of the entire tract, together with an estimate of the total cost of the logging railroad including logging equipment and accessories that would be adequate to remove all the timber. At the end of the first year's operations, the charge for depreciation should equal $1/20$, or 5 per cent. of the total thus determined, and a corresponding charge would be made each year thereafter, except that adjustments of the original estimates should be made from time to time as actual costs during the progress of the work are compared with the estimated costs and corresponding adjustments of the annual charge are made. It should not be difficult to get these estimates, for most lumbermen have the information available at all times. In case the company owns only part of the timber in a certain district but expects eventually to acquire additional timber to be cut and transported by it, the estimate can be made to include the additional amount.

In summarizing the principal points which I have endeavored to bring out, I repeat that a log-buying sawmill is entirely dependent upon the logs which it may buy; a few years may see the removal of all the timber which can be economically transported to the mill. This feature should be carefully considered in determining the economic life of such a mill and the consequent

Depreciation in the Lumber Industry

annual depreciation charge. In arriving at the annual charge for depreciation, especially at the commencement of operations, a company owning its own timber which it intends to cut and sell as logs, or cut and manufacture into lumber, should take into consideration the total cost of plant equipment necessary to log the entire tract and the probability of its abandonment thereafter.