Cost of Overhead

Metropolitan Life Insurance Company. Policyholders' Service Bureau.

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THE COST OF OVERHEAD

BUSINESS LEAFLETS

Number Nine

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Policyholders' Service Bureau
Business Management Service
Group Division

METROPOLITAN LIFE INSURANCE CO.
New York.
THE Cost of Overhead, number nine of a series of leaflets prepared by the Policyholders' Service Bureau. This Bureau is an organization cooperating with Metropolitan Group Insurance Policyholders on problems of management, labor cooperation and industrial health.
The Cost of Overhead

The problem of overhead is of a two-fold character. It is partly a question of policy, and partly of accounting method. There is no rigid line of separation between the two aspects of the overhead problem, but as far as possible this leaflet is limited to a consideration of overhead as a question of policy.

Overhead consists of those expenses of a business which cannot be directly traced to a product, job or process, or which it would be too costly to so directly trace. Aside from this, a substantial element of overhead has this characteristic—the expense is relatively fixed. It does not respond to increased sales, nor does it decrease when sales decline. Of this nature are the so-called fixed expenses; rent, insurance on equipment and buildings, taxes and depreciation. It is from the relatively fixed expenses that the problem of overhead arises.

Each Department Self-sustaining

Modern accounting, and in particular cost accounting, is founded on the theory that each phase of a business shall be self-sustaining and independently profit making. Much energy and ingenuity have been spent in devising methods of equitably allocating and absorbing overhead expenses. Floor space is measured; accurate account is kept of horse power and
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kilowatt hour consumption; machines are valued and segregated by departments; a record is kept of man and machine hours and of units of production; all to the end that no dollar of overhead belonging in one place may be wrongfully assessed against another.

Accepting Orders on Incomplete Costs

Rigid observance of the principle that all phases of an enterprise shall be independently profit making, would require the refusal of orders that did not cover the full charge for material, labor, and overhead. But it appears profitable to businessmen, under given circumstances, to accept orders that provide for only a share of the overhead. Inasmuch as a part of the overhead proceeds day after day, it represents an irretrievable loss when not absorbed in production. For specified times, for given products, or for selected territory, a case can be made out for accepting orders that will take care of material and labor and part of the overhead.

Just a few illustrations to make our point clear:

The clothing industry has two seasons between which there is usually a gap. A large manufacturer of waists makes special prices to jobbers, which prices cover material, labor, factory overhead, and part of the selling overhead. These orders in themselves are not profitable. But what would happen if they were not sought? The full load of overhead
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would go on day by day; there would be no production to carry it; and the overhead expenses would be a total loss. By specifying a reduced price, even though it does not take care of the full burden of overhead, loss is reduced, the factory is kept in operation and the workers are given more continuous employment.

A manufacturer of metal products produces a range which is profitable, and a radiator which is unprofitable. Shall he give up the radiator end of the business? If he did, a considerable amount of the overhead now carried by that part of the business would be chargeable against the manufacture of ranges, which amount of overhead is greatly in excess of the amount lost upon the radiator products. Thus business, in itself unprofitable, may contribute to the net profits of the business.

The internal situation of a plant may encourage acceptance of orders that do not provide for the full burden of cost, but the practice, if continued, may and undoubtedly will invite reprisals. The manufacturer of ranges who quotes a price upon radiators, his sideline, based upon incomplete costs, may expect in time similar treatment from manufacturers, for whom ranges are sidelines. The manufacturer of silk dresses who markets specific style numbers below cost, may find some of his own popular creations subjected to the same kind of disconcerting competition. Thus the practice of basing prices upon incomplete costs, which can be justified by the
requirements of single enterprises, may tend to demoralize an industry.

**Excess Capacity**

There is another phase of essentially the same problem. Broadly speaking, the amount of overhead expenses does not increase in proportion to increased production. The numerator of the overhead fraction, that is—the dollar of expense—is relatively stationary. It is the denominator—the volume of production—which fluctuates most widely. The tendency, then, is for lower unit costs as production increases. Unit costs of overhead are not absolute or determined. They yield to the pressure of increased production.

This fact the business man clearly perceives. He knows that his costs will be lowest when his production is at capacity, and so he is tempted to establish prices so low that they will encourage capacity sales, which by driving down the unit overhead costs alone make his selling prices profitable. The most successful of practitioners of this mode of operation stated the point substantially as follows:

"I set my prices below my lowest cost and make my costs conform to my selling prices."

It is well to admit that this method may prove very successful for individual manufacturers and for definite periods, but it is apt to be disastrous when sales do not come up to expectations. Even if it were to solve the problem of the single manufacturer, the ques-
tion arises as to what is to become of the rest of the enterprises engaged in an industry. Nothing is solved when a small group of manufacturers in an industry make a profit and the rest suffer; when one or two are working 100 per cent. capacity and the others are practically idle.

An industry is one great common pool of productive resources and the ultimate goal is the complete utilization of the entire equipment of an industry. There is, of course, such a condition as a ridiculous excess of productive equipment and where that is the case, the sooner it is liquidated the better for all concerned. There is, on the other hand, such a thing as a reserve of machinery, as there is a labor reserve, to take care of peaks of production, and our economic system must take note of and provide for both.

Using Normal Production

From the accounting point of view, this is accomplished by basing overhead, not on capacity, but on normal or standard production, a production that can be maintained year in and year out. When the production is above normal, the standard charges will be more than absorbed so that a reserve will be provided to take care of times when production is light. It is important that all overhead expenses be complete; that they be properly charged against departments and that they be equitably absorbed in production.
But more important than all of this is that overhead should be based on normal production and thus provide a cushion for the interruptions intermittently occurring in industry. This most important factor of the overhead problem is frequently overlooked and often ignored.

Thus one company writes:

We do not allow any margin for unused capacity inasmuch as we have none since our product is taken by only two companies over long period contracts.

(This, of course, makes no provision for what would happen if one of the two customers should go elsewhere).

A second company writes:

We do not work on the method of allowing a margin for unused capacity in determining overhead of our Factory. At such times when we are not running at full capacity our overhead burden is greater and by using a method of comparison with the previous months we at all times know the reason for the increase or decrease in overhead rate. We have never believed in trying to base our costs on a normal capacity of our Plant for the reason that our business fluctuates from month to month.

(Yet, these very fluctuations in business have made it necessary to have some standard for overhead which is found in the normal rate of production).

Contrast this with the practice of a third company:

We try to set our overhead rate at the beginning of each year on such a basis that during periods of production above normal, a reserve would be
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accumulated against which unabsorbed burden
during periods of less than normal production,
could be charged.

And the recommendations of the Electrical
Manufacturers' Council in its standard
accounting and cost system for the Electrical
Manufacturing Industry:

To avoid violent fluctuations in the percentages
and ratios of indirect expenses, from one period to
another, as the result of pronounced increases or
decreases in the volume of production, normal or
mean averages of percentages or ratios should be
calculated for a cycle of years.

Is Overhead an Evil?

It is not unusual to regard overhead as an
unmitigated evil, as a something which
threatens to destroy fair profits. The very
term "burden," frequently used to describe
overhead, is an indication of this attitude.
An enterprise, by this conception, staggers
under the load when the overhead is 110 per
cent. of productive labor, and is on the high-
way to prosperity when the overhead is only
25 per cent. As a matter of fact there is no
such necessary relation between the overhead
percentage and the favorable or unfavorable
situation of an enterprise.

Overhead is an outgrowth of a mode of
organization. When an enterprise is small,
with a product which is largely hand-served,
its overhead is naturally light. A peanut
vendor pays something for the rental of his
equipment, but about there his overhead
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stops. As an enterprise develops, it gradually takes on overhead, or rather it takes on overhead so that it may develop. Every substitution of the machine for hand labor means an increase in the overhead. Every time a mechanical stoker is substituted for hand firing, or a conveyor belt for hand carrying, or an overhead crane for trundling, the overhead expenses increase, while the total costs may decrease. American industry is committed to a high overhead precisely because it is committed to quantity production at low total operating cost.

Measuring Overhead

Whether it is profitable to take on additional overhead is susceptible of accurate measurement. The maximum investment justified for new labor-saving equipment is the ratio between the yearly savings and the yearly allowance for interest on investment, insurance, depreciation and upkeep of the added equipment. On the credit side are the yearly savings in direct cost of labor, in some of the fixed charges, and in earnings from increased production. From these savings should be deducted the yearly cost of power, supplies and other items, and the net figure multiplied by the percentage of the year during which the equipment will be employed.

To determine the yearly profit from the operation of mechanical equipment, the yearly cost of maintenance, which consists of the
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initial cost of the equipment times the sum of the percentages allowed for interest on investment, insurance, taxes, upkeep, depreciation and obsolescence, should be deducted from the yearly savings, as aforesaid.

In a recent number of Mechanical Engineering, there is an application of the foregoing principles: "Assume that the handling of miscellaneous materials about a factory which has formerly been done by four men, receiving $3.50 per day each, or, allowing 300 days per year, at an annual direct cost of $4,200, can be done by one man operating an electric storage battery industrial truck at a direct labor cost $1,050 per year, thus effecting a saving at the rate of $3,150 per year in direct labor cost.

"Assume also that through the greater promptness in moving materials and the more continuous operation of machines, there is an increase in earnings due to increased production, valued at $650 per year; also, that the labor involved, being counted as indirect, carries a fixed charge or burden of 10 per cent. In actual practice, the plant operates 240 days per year or 80 per cent. of the time. The various factors are estimated as follows:

<table>
<thead>
<tr>
<th>Percentage allowance on investment</th>
<th>6</th>
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<tbody>
<tr>
<td>Percentage allowance to provide for insurance and taxes</td>
<td>4</td>
</tr>
<tr>
<td>Percentage allowance to provide for upkeep</td>
<td>20</td>
</tr>
<tr>
<td>Percentage allowance to provide for depreciation and obsolescence</td>
<td>25</td>
</tr>
</tbody>
</table>

(10)
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Yearly cost of power, supplies, and other items which are consumed................. $450
Yearly saving in direct cost of labor................. $3,150
Yearly saving in fixed charges, operating charges or burden............................... $315
Yearly saving or earnings through increased production........................................... $650
Percentage of year during which equipment will be employed............................... 80

The maximum justified investment in dollars will therefore be:

\[
\frac{($3,150 + $315 + $650 - $450) \times 80\%}{(6\% + 4\% + 20\% + 25\%)} = \frac{5,331}{55\%}
\]

"This indicates that the equipment costing any sum below $5,331 will earn some profit above interest on investment and maintenance.

"Assume that an electric storage-battery industrial truck will meet the condition stated and that its cost will be $2,200, then the yearly cost to maintain equipment ready for operation, exclusive of labor will be $2,200 \times 55\% = $1,210. Then the profit from operation of the mechanical equipment becomes such $1,210 deducted from the saving on direct labor, $3,150, plus the yearly saving on fixed charges of $315, plus the yearly saving or earning through increased production of $650, less the cost of supplies, power and other items which are consumed of $450, all multiplied by factor of equipment use of 80 per cent. This leaves a profit of $1,722. The profit of $1,722 represents an annual earning upon the initial investment of $2,200 over all items of cost of over 78 per cent. The foregoing
formulas for testing the value of labor-saving equipment are presented for whatever suggestive value they may have."

**Overhead Ration**

While it is true that a large overhead percentage is not in itself alarming nor necessarily an unfavorable sign, it is a fact that in any particular plant where operations have become fairly well established, there is a tendency for a normal relationship to be assumed between direct charges and overhead expenses, and it is furthermore evident that an increase in this relationship between direct charges and overhead may represent a situation that should be remedied if possible.

A correct understanding of overhead, therefore, requires, not only a sound policy, but sound accounting methods. The accounting technique that goes with the control of overhead is beyond the scope of this leaflet, but the Policyholders' Service Bureau welcomes any inquiries upon overhead bearing upon questions either of policy or of accounting methods.
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Previously Issued

1. Budgeting for Business Control.
3. The Sales Budget.
4. The Control of Material.
5. Making the Most of the Small Shop.
6. Sources of Cost Information.
7. The Province of Sales Management.
8. The Annual Audit.