Cost Control With Fluctuating Production[1]

A Description of a Definite System for Making Up Cost Control Sheets Under Fluctuating Production

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MODERN managers must depend on various written reports to act as barometers of the condition of their businesses. Their decisions, as well as their estimates of the worth of their subordinates, are largely dependent upon the ideas conveyed by these periodic statements. Hence, the character of these reports is a matter of first importance. The cost statement is the common barometer of the economy and efficiency of the management of a department or industrial plant and it is with this statement that this paper deals.

The annual profit and loss statement of a business tells in a definite and unmistakable manner whether the business *has been* a financial success, but it is too late to be of any use so far as that year is concerned. The current cost sheet must be the report depended upon to guide management during the year to a satisfactory profit at the end of the year. To do this, there are several conditions that must be met by this report. It must be as nearly accurate as possible. It must appear promptly. It must tell not merely what has happened during the last period, but it must give a clear idea of how the business is progressing and what the profit for the year is likely to be in relation to what it should be.

In the case of a manufacturing department in which the production fluctuates considerably at different periods, the estimated cost report which should be prepared presents special difficulties, and the purpose of this paper is to propose a definite system by which cost control sheets can be prepared when the production fluctuates. If the production of a department is not constant, the actual costs obtained are very likely to mislead the management as to the efficiency with which the department is being conducted. In Table 1 are shown the figures for the production, materials, labor, expenses, and the total cost for a department in which the production, quarter by quarter, varied very greatly indeed.

TABLE 1

	Production	Cost per Unit			
		Materials	Labor	Expenses	Total
1st quarter	4,360	48.7	172	84.0	304.7
2nd quarter	12,113	35.8	91	56.1	182.9
3rd quarter	17,648	41.3	76	31.3	148.6
4th quarter	7,280	38.0	121	73.3	232.3
Average for Year	———	39.8	98.4	51.6	189.8

The selling price for this department was 166, so that the department was clearly running at a loss. The management was well aware of this and the department head instituted changes in production methods which resulted in a cost for the first quarter of the next year of 248.4, the production being approximately the same as for the corresponding quarter of the year before. The question for the management is whether the changes have accomplished the end; that is, whether in the current year the cost of production will be sufficiently lower to give a satisfactory profit with a selling price of 166. It is clear that if the cost is to be the same as for the first quarter, there will be a heavy loss, but owing to the variation in production the cost is expected to go down for the remainder of the year.

At first sight it would seem that until the year is completed it is impossible to tell whether the department is running profitably or not, but, as will be shown in this paper, it is quite possible to calculate what the cost will be for any level of production and thus to find out whether the cost at any time is such as to give a satisfactory profit on the whole year's work or not. This assumes

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that the variation of production through the year is known, and in most seasonal trades it is known fairly accurately from previous experience. As a matter of fact, in the case given, it was found possible to calculate a corrected average cost giving the same results for the year. The figures obtained are shown in Table 2.

TABLE 2

	Actual Cost Uncorrected for Production	Cost Corrected to Equal Production
1st Quarter	304.7	207.0
2nd Quarter	182.9	181.6
3rd Quarter	148.6	180.1
4th Quarter	232.3	185.3
Average for Year	189.8	185.5

TABLE 3

Product "A"—Plant "1"

	Actual Costs May, 1928	Estimated Costs May, 1928
Production	15,825	
Cost per Unit		
Materials	$ .44	$ .48
Labor	.52	.56
Expense	.74	.78
Total Cost	$1.70	$1.82
	June, 1928	June, 1928
Production	19,834	
Cost per Unit		
Materials	$ .51	$ .48
Labor	.48	.50
Expense	.68	.66
Total Cost	$1.67	$1.64
	July, 1928	July, 1928
Production	23,642	
Cost per Unit		
Materials	$ .52	$ .48
Labor	.44	.46
Expense	.67	.58
Total Cost	$1.63	$1.52

Correcting the first quarter of the next year in the same way, a corrected cost was found of 172.5 in comparison with the actual cost of 248.4. This showed that while the economies made in the department had been very beneficial, they were not sufficient, since the sale price was 166 and the department was still, therefore, running at a loss. This knowledge enabled the corrected cost for the third quarter to be reduced to 152, and in the course of time the cost was reduced to 120, leaving a very satisfactory profit on the sales.

To take a less glaring example, let us consider the figures shown in Table 3. This table shows the actual costs for three months of a department in which the production was increasing as the year progressed. It is seen that there is a steady but small reduction in cost and if these figures were presented to a manager he would probably be satisfied with them, though it might seem to him that the reduction was small in view of the increased production. But, in the table also are shown costs which have been estimated in advance for the different amounts of production by a method which will be explained later. It will be seen that whereas the May cost was below the estimate, the July cost was considerably above the estimate, so that the department clearly needs attention, since the reduction in cost is by no means that which should have been attained for the increased production.

The solution of the problem presented by this paper involves a combination of some of the principles and methods of cost accounting, statistics and industrial engineering. Items must be analyzed and segregated from the point of view of the cost accountant. These items may then be illustrated by the common methods of statistics and lastly compared with standards arrived at through methods of time study and the determination of correct standard practice.

From the accountant's viewpoint cost items may be divided into three general classes.

First, there are fixed charges, or items that are constant for a given period of time. This includes such items as rent of building, depreciation on equipment, insurance, taxes, etc. The unit cost for such items will decrease as production increases.

Second, come items that vary directly with production, such as material. The unit cost for these items will be constant regardless of production, within reasonable limits.

Third, are the items which are not entirely of either class but depend both on the extent of production and the duration of time. Maintenance and sundry supplies usually fall into this group. The unit cost for items of this character will decrease as production increases, but not as rapidly as in the case of fixed charges.

We shall now consider methods of portraying the effect of varying production on these types of cost