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Albert V, Bristol

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**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**

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**Accumulating the Over-
head**

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

NATIONAL ASSOCIATION OF COST ACCOUNTANTS

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Vol. V. No. 12

March 1, 1924

Accumulating the Overhead

ALBERT V. BRISTOL
American Hard Rubber Company,
New York City

BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK CITY

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National Association of Cost Accountants

ACCUMULATING THE OVERHEAD¹

The preparation of this article has impressed upon me more than ever before the close relationship between "Accumulating the Overhead" and "Distributing the Overhead." In many cases I have found that the answer to "How the Overhead Should be Accumulated" must be determined by the use made of the overhead in its distribution. I decided, therefore, it was best to give both subjects their relative consideration and then eliminate all matter strictly related to "Distributing the Overhead."

DEFINITIONS OF TERMS

The cost system of a manufacturing concern should serve a twofold purpose, namely, to show the cost of manufacturing by controllable groups, and then to show how that same cost affects the value of the product made for sale. To do this the record of the cost of overhead must be compiled, first, to show its controllability by the operating management, and second, its effect on the cost of product.

Therefore, in an article of this kind it would seem well to cover the subject in a manner applicable to a factory, the product of which is so varied that a single unit for the measurement of that output probably would not be adopted. It would seem desirable also to define any terms which we may find necessary to use, such as the following:

1. Direct material is the material which becomes a part of a given article in its deliverable form.

2. Direct labor is that labor which is directly used to turn out the product for which a department is created. (Hence, the repairs made by the Maintenance Service Department are direct labor of that department.)

3. Converting is changing raw material from the form in which it was purchased. In the rubber industry this would cover the operations through compounding; in foundry practice through the cupola, etc.

4. Forming is making into shapes as by pressing, stamping, molding, etc.

5. Processing is any refining of shape by hand or machine.

6. Fitting and assembling is the fitting of component parts for assembly and the actual assembling of such parts into a completed article.

¹ This article is based upon a paper read before a meeting of the New York Chapter.

7. Power service should include generation, transmission, heat and light.

8. Maintenance service covers the general mechanical work necessary to keep the plant running, and includes all maintenance and repairs of plant and equipment.

9. Control service includes all clerical and general office work, such as general supervision, planning, dispatching, employment, accounting, etc.

10. Productive departments are those departments in which the labor is performed directly on the product to put it into saleable condition (comprising 3, 4, 5 and 6 above).

11. Contributory departments are those departments which perform service for other departments (comprising 7, 8 and 9 above).

12. Burdens are all expenses other than direct labor and direct material (including items 7, 8 and 9 above and as noted below).

ELEMENTS OF MANUFACTURING

We can now state that manufacturing consists of a combination of two or more of the following:

Direct Material

Productive Efforts

Converting

Forming

Processing

Fitting and Assembling

Contributory Efforts

Power Service

Maintenance Service

Control Service

BURDEN CLASSIFICATION

In arriving at the total cost of product we recognize, of course, that the cost of contributory efforts is a burden to be combined with the cost of productive efforts by some method of distribution. We also know that each department, whether housing productive efforts or contributory efforts, has overhead or burden expenses of its own. These departmental burden items may be divided into three groups:

Product Burden

Equipment Burden

General Burden

Such expenses might be further subdivided as follows:

Product Burden

Inspecting

Repairing

Storing
Teaching beginners, etc.

Equipment Burden

Current Repairs on:

Buildings
Equipment
Machinery
Tools
Furniture

Fixed Charges

Depreciation
Taxes
Insurance

General Burden

Supervision
Clerical
Cleaning and Oiling
Receiving and Storing Purchases
Shipping

ACCUMULATING FOR A DEPARTMENT

Accepting as basic the above definitions, etc., let us next examine the result of some particular cost compilation and find out how that result was obtained. Suppose we take up a departmental cost sheet, for instance (see Form 1 on page 6). This form shows the cost of operating Department No. 1, known as the Converting Department. On this form we note that in a given period \$864 was paid for direct labor. As this is a productive department, as previously defined, we know that this labor was spent on product made for sale. Reference to the service tickets (time tickets) covering this labor will reveal the amount of direct or productive labor spent on each class of product.

We also note on the form that the total burden or overhead of this department for the period under review was \$1,112. A study of Form 1 reveals the fact that \$817 occurred directly in the department or at least was more or less subject to the control of the department head. Of this amount \$97 were overhead due to the product turned out during the period. \$105 were due to repairs of equipment of the department. \$415 were fixed charges, and \$200 general expenses, as previously defined.

SOURCES OF BURDEN CHARGES

Suppose we now put ourselves in the place of the foreman of this department and call on the Accounting Department for the de-

COST OF OPERATING DEPT. I PERIOD ENDING 19__

DEPARTMENT I. CONVERTING	CAPACITY TONS	TOTAL COST TO OPERATE	DIRECT LABOR		TOTAL BURDEN		ANALYSIS OF BURDEN															
			AMOUNT	RATE	AMT	RATE	EQUIPMENT		GENERAL		AMT	RATE	AMOUNT	PROPORTION CONTRIBUTORY DEPTS.								
							AMT	RATE	AMT	RATE					AMT	RATE						
			PRODUCT	AMT	RATE	AMT	RATE	CURRENT	FIXED	AMT	RATE	AMT	RATE	AMOUNT	PROPORTION							
30 MEN 1440 HRS.		864		864																		
INSPECTING		72				72								72								
REPAIRING		25				25								25								
BUILDINGS		15				15								15								
MACHINES		90				90								90								
DEPRECIATION		290				290								290								
TAXES		75				75								75								
INSURANCE		50				50								50								
SUPERVISION		100				100								100								
CLERICAL		35				35								35								
CLEANING		25				25								25								
MISCELLANEOUS		40				40								40								
POWER		160				160								160								
MAINTENANCE		15				15								15								
CONTROL		120				120								120								
TOTALS		1976		864		1112								97		105		415		200		295
RATE PER TON																						
" " MAN HR.																						
" " \$ DIRECT LABOR																						
ESTIMATED COST OF MATERIAL REQUIRED		8000																				
STANDARD FOR BUDGET		9976																				

tail comprising these charges. The Accounting Department would report such information as follows:

CHARGES FROM SERVICE (TIME) TICKETS

Labor inspecting product			
Class B	\$1.00		
“ C	30.00		
“ I	9.00		
“ N	2.00		
“ S	30.00	\$72.00	
		<hr/>	
Repairing Class S		20.00	\$92.00
		<hr/>	

Here the Accounting Department has been able to show the foreman that the charges were made directly from payroll records approved by his authority; that is, either by himself, his assistant or his clerk.

This leaves charges of \$5 which were not labor. This will be found under Material Used Tickets.

SALARY LIST (GENERAL)

Foreman and Assistant	\$100.00	
Dispatch Clerk	35.00	
Janitor	20.00	\$155.00
	<hr/>	

The foreman, of course, is familiar with the salary list of his own department and accepts this analysis.

MATERIAL USED TICKETS

Repairing Product S	\$5.00
“ Buildings	5.00
(Proportionate repair of roof)	
Repairing Machinery	27.00
Cleaning “	5.00

The Material Used Tickets are produced to show the foreman the actual materials issued on his own requisition for repairing the product and for cleaning and oiling the department and its equipment. The Accounting Department shows the foreman that the roof of the building which houses his department had to be repaired, and that the cost of such repairs is divided between the departments in the building in proportion to the space occupied by each. The material charge for repairing machinery was for material issued on a requisition of the machine shop foreman for use on repair orders placed by the foreman of Department No. 1.

Other charges furnished by the Accounting Department are shown to be for the following:

LABOR FROM MAINTENANCE AND SERVICE DEPARTMENT AS PER SERVICE TICKETS (TIME TICKETS)		
Carpenter Shop	\$10.00	
(Proportionate repair of roof)		
Machine Shop	63.00	

LIABILITY AND COMPENSATION INSURANCE \$20.00

As the premium for liability insurance is set as a rate per dollar of payroll, the foreman finds that this charge, \$20, is in proportion to the wages paid in his department.

DIRECT CHARGE FROM THE VOUCHER REGISTER

Outside parties making an emergency call—\$20.00

A breakdown caused an emergency call on a physician not covered by the insurance policies. This charge, not being the purchase of material, which could be handled through the storeroom records, nor the employment of labor, which might appear on the payroll, demanded special consideration. The bill when received was not covered by a receiving report. Therefore, the charge was passed for payment on the direct approval of the works manager. In the bill register it was of course entered as a charge to the factory ledger. In the factory ledger it was carried to a suspense account used for all special items called "Factory Adjustments." It was cleared by journal entry from this account to the general overhead of the department incurring the expense. The foreman has now obtained a detailed explanation of his departmental charges as follows:

PRODUCT BURDEN

Labor	\$92.00	
Material	5.00	\$97.00
	<hr/>	

EQUIPMENT BURDEN—CURRENT

Labor—Carpenter Shop	\$10.00	
Machine "	63.00	73.00
	<hr/>	
Material—Carpenter Shop	5.00	
Machine "	27.00	32.00
	<hr/>	105.00

GENERAL BURDEN

Salaries	\$155.00	
Material	5.00	
Liability Insurance	20.00	
Special Charge	20.00	200.00
	<hr/>	

Now, suppose the foreman, desiring to earn a bonus by a low cost record, says to the chief accountant, "How does it come that my fixed charges are so high?" The chief accountant shows him

the record of investment for his department. It is explained to the foreman that for every piece of equipment in his department a card record is kept showing its original installed value; its expected life; a rate of depreciation based on that expectancy; the accumulation of depreciation to date based on that rate; its present sound value, and a record of repairs made to it since its installation. The foreman also finds that the portion of the building he occupies has been carefully valued and rates of depreciation established, based on the expected life of the various portions.

For taxes he discovers that the total value of the plant is taken and divided into the sum of the taxes paid to obtain a rate per dollar of investment. If the tax bill is divided between real and personal property, the plant values are divided in like manner, and the rate for each class of taxes is obtained. These rates are then applied to the values which have already been shown to the foreman as invested in his department, and thus the proportion of taxes chargeable to his department is obtained. Fire, and use and occupancy insurance costs are divided between the departments in like manner.

Income taxes, of course, are not treated as overhead, being regarded as a distribution of profits to a preferred partner.

Up through this point the cost of contributory departments is handled in the same manner as the cost of the productive department which we have just been reviewing. For instance, the operating cost sheet for the machine shop of the Maintenance Service Department would show as direct labor all labor performed doing maintenance and repair work chargeable to other departments than itself. Repair to its own equipment will go direct to Equipment Burden of the Maintenance Department.

INTERDEPARTMENTAL CHARGES

In this manner we are able to give the works management a set of reports showing the cost of operating each department and of the factory as a whole (see Form 2 on page 10). However, as we are in business to secure profits from the sale of products, we must convert these costs of operating into costs of product for sale. Since the output of our contributory departments is sold only to ourselves for the purpose of operating the productive departments, we must find some basis for charging the costs of these departments to the productive departments.

Of course there are some interdepartmental charges between the contributory departments which must be disposed of before these departments are finally closed out.

Since the cost of contributory departments is eventually to be charged to productive departments, absolute accuracy of charges between contributory departments is not essential. Hence we will accept service from the Maintenance Department to the other contributory departments at labor plus material only. We will accept

PLANT OPERATING REPORT FOR PERIOD ENDING 19__

DEPARTMENTS	BASIS		OPERATING AT CAPACITY	TOTAL OPERATING COST	DIRECT LABOR		BURDEN INDIRECT LABOR & MATERIAL		ANALYSIS OF BURDEN												
	STANDS	PER HOUR			AMT	HRS	AMT	RATE	AMT	RATE	PRODUCT			EQUIPMENT			GENERAL			CONTRIBUTORY EXPENSES DISTRIBUTED	
											AMT	RATE	AMT	RATE	AMT	RATE	AMT	RATE	AMT		RATE
1 CONVERTING				1976	864		1112		97		105		415		200		295				
2 FORMING				3800	600		2200		450		120		600		400		630				
3 PROCESSING				1800	1600		1200		200		40		280		200		480				
4 FITTING AND ASSEMBLING				1000	300		700		100		30		170		210		190				
TOTAL OPERATING				8576	3364		5212		847		295		1465		1010		1595				
DIRECT MATERIAL				4260																	
TOTAL COST OF PRODUCT MADE				12836																	
5 POWER				545	235		310		110		20		50		130						
6 MAINTENANCE				400	300		100				15		30		55						
7 CONTROL				650	200		450				40		20		390						
TOTAL SERVICE DISTRIBUTED OVER PRODUCTIVE				1595	735		860		110		75		100		575						
REMARKS																					

PRODUCTIVE

CONTRIBUTORY

service from the Power Department and the Control Service Department at a fixed figure for each accounting period to each of the other contributory departments. In other words, power will be furnished to the Maintenance and Control Departments on a basis similar to a rental, and the control service will be furnished to the Power and the Maintenance Departments on a fixed rate basis per week or month, according to the length of the accounting period. Such charges form part of the amounts shown for the contributory departments in the General column on Form. 2.

Having credited each of the contributory departments for these definite charges against each other, we next proceed to close out to the productive departments the balance left in the accounts of each of the contributory departments.

Now we have reached that phase of the subject which falls strictly under the heading "Distributing the Overhead," of which it is not the purpose of this article to treat.

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