

CHAPTER 21

PROCESS COST ACCOUNTING2101 GENERAL

210101 Purpose. The determination as to the need for a formal process cost accounting module in an accounting system is necessarily a management decision. The decision to establish such a module should be based upon a recurring need for cost accounting information. The cost accounting standards that shall be implemented when a decision has been made to establish a formal process cost accounting module are in [Chapter 19](#) of this Volume. This chapter discusses how to establish a process cost accounting module, the type of source documents required, typical management reports produced by the module, and possible uses of these reports.

210102 Overview

A. A formal process cost accounting module provides a cost identification method for determining, reporting, analyzing, and controlling the cost of a particular process or series of processes. It classifies, records, presents, and interprets in a significant manner, the material, labor, and overhead expenses necessary to produce a product or service.

B. The management information provided by a process cost accounting module is a tool that aids management in the guidance of activities and in attaining the objective of producing a maximum of goods and services at the least amount of costs. The formal cost accounting module is normally designed to accumulate those costs that are under the control of local management. Typically the system manager controls all costs that are funded by appropriations for funds provided to the accounting entity. These costs are referred to as funded costs. [Chapter 20](#), paragraph 200311, of this Volume provides guidance for accumulating unfunded cost. If a formal cost accounting module is to be used as a basis for billings to other organizations, other Federal Departments or the public, then provisions must be made for the addition of unfunded cost, such as military labor, items obtained from inventory on a free issue basis, and civilian retirement cost not financed by the employee or Department of Defense appropriations. [Volume 11](#) of this Regulation provides guidance on the cost elements that are billed to various organizations.

2102 INTERFACE WITH GENERAL ACCOUNTING SYSTEM

210201 A formal process cost accounting module must be fully integrated with other modules of the general accounting system, i.e., it must interface with the payroll and fund control modules. Cost accounting module subsidiary accounts are controlled by general ledger accounts.

210202 The principal general ledger control accounts used with a process cost accounting module are the Inventory Held for Sale and the Work in Process-In-House accounts. Table 21-1 illustrates accounting entries for such accounts.

ACCOUNTING ENTRIES FOR INVENTORY FOR AGENCY OPERATIONS AND THE INVENTORY-WORK IN PROCESS-IN-HOUSE ACCOUNTS	
Dr 1581	Work in Process-In-House
Cr 2211	Accrued Payroll-Civilian
To record labor cost entered into the process cost accounting system.	
Dr 1581	Work in Process-In-House
Cr 1521	Inventory Held for Sale
To record material and supplies placed into the process cost accounting system.	
Dr 1521	Inventory Held for Sale
Dr 6500	Cost of Goods Sold
Cr 1581	Work in Process-In-House
To record the relief of work-in-process of the completed products to inventory or customer.	

TABLE 21-1

2103 ESTABLISHING THE PROCESS COST ACCOUNTING MODULE

210301 Identification of Cost Centers

A. Normally, the first step in establishing the process cost accounting module is to request an industrial engineering evaluation of the production processes and flows. This step requires an analysis of the work to be accomplished and a determination of the most logical, efficient, and economical sequence of production and support operations. Production operations are then consolidated into logical cost centers to perform specific tasks that produce an identifiable and measurable output. Production operations are designated as direct cost centers and support operations are designated as indirect cost centers. For example, a chemical product may require three distinct operations: blending, distilling, and packaging. The blending of ingredients may be assigned to one production cost center while the distillation process is assigned to another production cost center. Finally, the product packaging is assigned to a third production cost center.

As the chemical product is completed, it is transferred from the last production cost center to the customer and the associated cost is posted to the Cost of Goods Sold account.

B. The functions of personnel, recruitment, plant maintenance, and accounting may be grouped into indirect cost centers. Each cost center is assigned an identification number that is subsidiary to the general ledger control account Work in Process-In-House. This identification number is entered on all contracts, inventory item requisitions, and labor distribution source documents to result in the accumulation of cost center incurred costs.

210302 Identification of Product to be Produced. The second step in establishing the process cost accounting system is to determine the specific products to be produced and the definition of what constitutes output in terms of a product for each cost center. For those products to be produced, an industrial engineer determines the direct labor and material requirements for each stage of the process and identifies the measurable unit of output for each cost center. For example, chemical products may be measured in terms of the number of gallons blended, distilled, and packaged by the various production cost centers.

210303 Establishing Standard Cost per Unit

A. Frequently there is a third step performed by the industrial engineers--the establishment of a standard cost for output units of production cost centers. The standard cost, when compared to the actual unit production cost, can be used by management to measure the cost efficiency of a cost center or to determine if various inefficiencies have entered into the system. The difference between actual cost and standard cost is termed a variance. Management should investigate both favorable and unfavorable variances to determine their cause. A favorable variance shows that the cost center is operating in an efficient manner. An unfavorable variance alerts management that attention is required. In the event an organization prices products at the standard cost and a variance occurs, the standard cost must be adjusted by the variance in order to recover actual cost. The variance is determined by dividing total actual cost of the cost center by the total standard cost. For example, if cost center A had actual cost of \$20,000, and had produced 1000 items with a standard cost of \$15.00 per unit for a total standard cost of \$15,000, then the variance would be 33.3 percent. This variance indicates the cost center is not operating efficiently. Billings at standard cost would also have to be multiplied by 133.3 percent to recover actual cost (i.e., $\$15.00 \times 133.3\% = \20.00).

B. A different costing procedure may be followed by revolving fund organizations that use stabilized prices. These organizations may simply accumulate the variances and recover them as part of the following year's standard price.

210304 Source Documents Required. The principal categories of cost charged to the production cost centers are direct labor, direct material, contract, and overhead (includes indirect labor and indirect material costs).

A. Labor Source Documents. Source documents for labor costs are time cards. Time cards are coded with the cost center identification number and accumulate the total labor hours worked by employees assigned to the cost center. Hours may be recorded mechanically by a time clock as employees punch in and out daily, or they may be recorded manually by workers or a timekeeper. At the end of each pay period, the civilian payroll system summarizes the hours worked as reported on approved time cards, obtains pay rate data from the personnel system and calculates gross and net pay, based on payroll and withholding authorizations for each employee. A labor distribution report that identifies payroll cost by cost centers based upon the cost center identification number is prepared using the pay computed by the pay system. This distribution computation may be part of the pay system or it may be included in the cost accounting module. The responsibility for determining who shall perform the labor distribution is a management function.

B. Material Source Documents. There are many source documents that are used to identify material costs. This paragraph discusses some of the more common documents:

1. DD Form 1348, "DoD Single Line Item Requisition System Document (Manual)". This form is prepared by the activity requesting material and is coded with the cost center identification number. The form is forwarded to the installation supply officer for approval and to determine the supply availability through the Military Standard Requisitioning and Issue Procedure (MILSTRIP). When the applicable material is issued, it is charged to the account and recorded in the subsidiary account established for the cost center. [Chapter 4](#) of this Volume provides guidance to be followed in determining the price of material that is released from inventory.

2. Contracts and Purchase Orders. Contracts and purchase orders are another major category of source documents used to purchase material from vendors. When the material is received, an accounts payable is established and applicable amounts are entered into the Work in Process-In-House subsidiary account for the cost center. Contract and purchase orders are entered directly into the Work in Process-In-House account rather into the Inventory Held for Sale account because the materials are purchased expressly for a particular job. Direct application is preferable to commingling the materials with other materials in the Inventory Held for Sale Account.

3. Transfer Tickets. Transfer tickets are used when production units are transferred from one cost center to another cost center. The cost center transferring production units prepares the transfer ticket and the receiving cost center signs for receipt of the material. The transfer ticket contains the number of production units being transferred. A copy of this document is provided to the cost accounting office that records the movement of material.

C. Overhead Source Documents. Overhead costs pertains to the allocation of costs incurred by indirect cost centers to producing cost centers. This cost is allocated through use

of a worksheet prepared by the accounting office. The worksheet summarizes and allocates indirect cost center expenses to direct cost centers. Various methods for allocating overhead include: direct labor hour basis, direct labor cost basis, machine hour basis, or the material cost basis. The method chosen must be used consistently from one period to the next in order to permit meaningful comparisons. The direct labor hour basis method for allocating indirect cost center expenses to direct cost centers is illustrated below:

<u>ALLOCATION WORKSHEET</u>				
<p>The total indirect cost center expenses for the period are \$48,000 dollars. Cost center A used 1200 direct labor hours, cost center B used 900 direct labor hours, and cost center C used 300 direct labor hours during the period.</p>				
<u>FORMULA:</u>				
$\frac{\text{Indirect Cost Center Expenses}}{\text{Total Direct Labor Hours All Cost Centers}}$		=	Factor	
<u>ILLUSTRATION:</u>				
$\frac{\$48,000 \text{ dollars}}{2400 \text{ direct labor hours}}$		=	\$20 per Hour	
Cost Center	Direct Labor Hours	Factor Per Hour	=	Amount Allocated
A	1200	X	\$20	= \$24,000
B	900	X	20	= 18,000
C	<u>300</u>	X	20	= <u>6,000</u>
Totals	<u>2400</u>			<u>\$48,000</u>
<p>Footnote: Material can be added at the beginning of the period, during the period, or during a certain point in the process, e.g., when 50% complete.</p>				

210305 Number of Units Produced

A. The number of units still in process within a process cost center are expressed in terms of equivalent production units. The calculation of equivalent production inventory is based upon a physical inventory to determine the production status. For example, if

the cost center had 100 units that were 75% complete for material and labor, 50 units that were 50% complete for material and labor, and 30 units that were 10% complete for material and labor, the equivalent production units would be 103 ($[100 \times 75\% = 75] + [50 \times 50\% = 25] + [30 \times 10\% = 3]$).

B. The ending inventory of production units are added to the sum of production units transferred out, minus the beginning inventory of equivalent production units to determine the total number of units produced during the accounting period by the department. The calculation is illustrated below:

<u>UNITS PRODUCED WORKSHEET</u>	
	NUMBER OF UNITS
Transferred Units	1100
Equivalent Units	103
Sub Total	<u>1203</u>
Less: Beginning Equivalent Units	<u>(100)</u>
Total Production This Month	<u>1103</u>

C. An illustration of the use of standard cost to evaluate production efficiency or problems follows:

	UNIT COST	NUMBER OF UNITS	COST
Standard Costs			

Labor	\$ 50	x	1103	=	\$ 55150
Material	35	x	1103	=	38605
Overhead	<u>15</u>	x	1103	=	<u>16545</u>
Total Standard Cost	\$100	x	1103	=	<u>\$111300</u>
Actual Costs					
Labor					\$ 60000
Material					35000
Overhead					<u>20000</u>
Total Actual Cost					<u>\$115000</u>
Variance					<\$ 3700>

210306 Variance Analysis

[Chapter 20](#), paragraph 200307 of this Volume provides guidance for various analyses. Table 20-7 in [Chapter 20](#) of this Volume provides a chart for identifying possible causes of variances.

210307 Subsidiary Accounts. Each cost center should maintain the capability to array data in sufficient detail necessary to satisfy management information requirements. Cost center subsidiary accounts may be established within individual cost centers in order to cost a product or service. For example, it may be necessary to accumulate direct labor, direct material, and overhead in subsidiary accounts. Accounting information is posted to the cost center subsidiary accounts as it becomes available via labor distribution reports, material reports, and overhead worksheets.

2104 MONTH END REPORTS

Month-end production cost reports produced by a process cost accounting system in operation at a Defense Component operating under direct appropriation procedures with three production cost centers is illustrated in Table 21-2. The illustration is presented to clarify the concepts and methodologies previously discussed in this chapter.

PROCESS COST ACCOUNTING REPORT FOR THE MONTH OF XXXX, 19XX
UNITS PRODUCED

<u>PART A: UNIT PRODUCTION</u>								
	COST CENTER A		COST CENTER B		COST CENTER C		TOTAL UNITS	
Beginning Inventory	100		200		100		100	
Transferred During Month	500		500		500		500	
Units to be Accounted for	600		700		600		600	
Ending Inventory	100		200		100		100	
Production During Month	500		500		500		500	
<u>PART B: COST</u>								
	COST CENTER A		COST CENTER B		COST CENTER C		TOTAL COST	
	STD.	ACT.	STD.	ACT.	STD.	ACT.	STD.	ACT.
Funded Cost:								
Labor	\$ 55150	\$ 60000	\$ 45000	\$ 46000	\$ 30000	\$ 30000	\$ 130150	\$ 136000
Material	38605	35000	40000	38000	15000	16000	93605	89000
Overhead	16545	20000	15000	15000	10000	10000	41545	45000
Subtotal	\$110300	\$115000	\$100000	\$ 99000	\$ 55000	\$ 56000	\$ 265300	\$270000
Unfunded Cost:								
Military Labor	\$ 5100	\$ 5000	\$ 4500	\$ 4700	\$ 2000	\$ 2000	\$ 11600	\$ 11700
Civilian Retire	3800	3600	2500	2400	1500	1500	7800	7500
Free Issue Mat.	4000	4500	2500	2500	1000	1000	7500	8000
Subtotal	\$ 12900	\$ 13100	\$ 9500	\$ 9600	\$ 4500	\$ 4500	\$ 26900	\$ 27200
Subtotal Funded & Unfunded	\$123200	\$128100	\$109500	\$108600	\$ 59500	\$ 60500	\$ 292200	\$ 297200
Depreciation @ 4%	\$ 4928	\$ 5124	\$ 4380	\$ 4344	\$ 2380	\$ 2420	\$ 11688	\$ 11888
TOTAL COST	\$128128	\$133224	\$113880	\$112944	\$ 61880	\$ 62920	\$ 303888	\$ 309088
<u>PART C: FINISHED UNIT STANDARD AND ACTUAL COST</u>								
FUNDED COST							\$ 530.60	\$ 540.00
UNFUNDED COST							53.80	54.40
DEPRECIATION FUNDED AND UNFUNDED							23.38	23.78
TOTAL COST ^{1/}							\$ 607.78	\$ 618.18

^{1/} General and administrative costs are to be added to the sales price when applicable

TABLE 21-2