

Chapter 3

Job-Order Costing System

Job-order costing system is used by companies that produce *heterogeneous* products or services which are made to *customer specifications*. As a result, each job or order tends to be different. Example of companies that use job order costing includes automobile repair, job printing, and wood furniture.

When a job is started, a WIP account will be open for that job in the **Subsidiary Ledger** to *accumulate* all the production costs spent on that job.

Production costs include two types of costs: *Direct* costs (i.e., DM and DL) that can be easily **traced** to each individual order and *Indirect* costs (i.e., MOH) that are impossible to trace to the individual jobs and hence they should be **allocated**.

As production takes place, manufacturing costs are tracked in the Work-in-Process Inventory account. Every product is made up of three cost components: direct materials, direct labor, and manufacturing overhead.

There are two approaches to allocate the FOH to the individual jobs or orders: **Actual Costing System** and the **Normal Costing System**.

Job-Order Costing Under Actual Costing System

Actual costing is a costing system that traces actual direct costs to a cost objects and allocates **actual manufacturing overhead costs** based on actual overhead cost rate. The following steps illustrate how to allocate indirect costs to cost objects under actual costing job-order system.

1. Record the **actual** overhead costs incurred during the accounting period on **all jobs** on the debit side of the T account of **actual FOH control**.
2. Choose an **allocation base** (i.e., a cost driver for overhead) which is common to all jobs. The most widely used allocation bases are direct labor-hours, direct labor costs, machine-hours, and direct material costs.
3. Calculate the total amount of the **allocation base** used in all jobs during the period.
4. Compute the application rate per unit of each cost-allocation base to allocate indirect costs to the cost object(s)

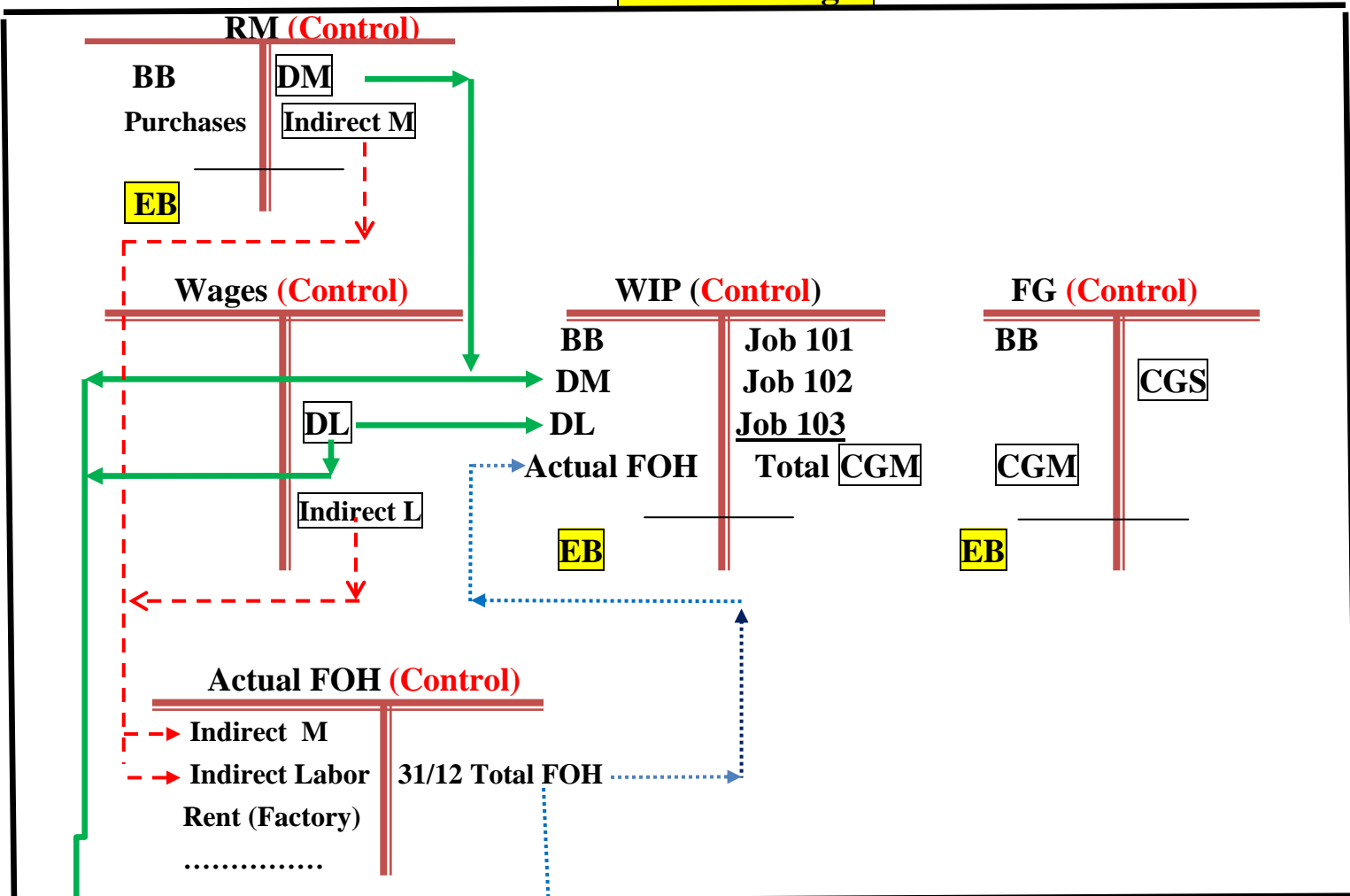
$$\text{Overhead Application Rate} = \frac{\text{Actual Total Costs to be allocated}}{\text{Actual Total Allocation Base}}$$

5. Compute the overhead costs allocated to each Job as follows:

$$\text{Applied FOH} = \text{Actual Quantity used of the Base} \times \text{Application Rate}$$

Actual Job-Order Costing System

General Ledger

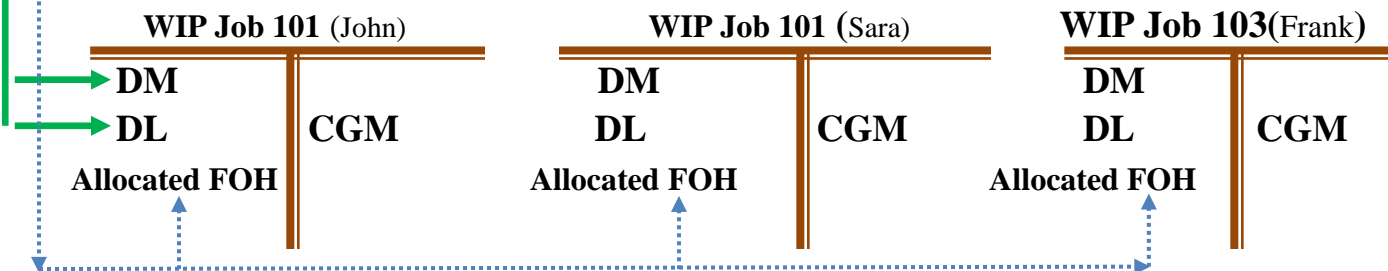


Application of Actual FOH at the **End** of Each Period

Allocation Rate = Actual Total FOH Incurred / Actual Total Q. of Base Used

Allocated FOH to Job X = Overhead Rate * Actual Q. of base used in Job X

Subsidiary Ledger



Example 1: (Actual Costing System)

Jordan Co. **started business** on January 1, 2010. Jordan Co. manufactures and sells office furniture: chairs, tables, and podiums. Jordan applies Job-order costing system and uses Direct Labor Hours as an allocation base.

During the month of January, Jordan received and completed the following three orders:

1. John Stuart ordered 5,000 recliner chairs,
2. Andrew Muller ordered 1,000 Tables
3. Ashley Simon ordered 200 Bookshelves.

The following costs are the **actual cost incurred**

Cost items	Total Costs	Cost Objects		
		John Stuart's Order (5000 Chairs)	Andrew Miller's Order (1000 Tables)	Ashely Simon's Order (200 Bookshelves)
Wood	\$152 K	1 Sheet @ \$20 = \$20= 100 K	2 Sheets @ \$20 = \$40 K	3 Sheets @ \$20 = \$12 K
Fabric	\$50 K	2 Meters @ \$5 = \$50 K	None	None
Glass	132 K	None	1 Piece @\$100 = \$100 K	2 Pieces @ 80 = \$32 K
DL Cost	128 K	1 hour @ \$20 = \$100 K	1hours @ \$20 = \$20 K	2 hours @ \$20 = \$8 K
DL Hours Used		5,000 hours	1,000 hours	400 hours
Supervisors				\$40 K
Production Manager				\$10 K
Indirect Materials			Glue, Paint, Nails, Sand Papers, etc. =	\$45 K
Rent (Factory)				\$15 K
Depreciation				\$18 K
Total FOH				\$128 K

Total raw materials purchased during January were \$400,000 (direct and indirect materials).

Required:

1. Prepare the required T accounts required to calculate the cost of CGM under **Actual** Costing System.
2. Prepare the required T accounts required to calculate the cost of CGM under **Normal** Costing System. Assume that on January 1, Jordan estimated that the company will use 7,000 direct labor hours during the month and that the factory overhead is estimated to be \$154,000 per month.

Template to Example 1

RM (Control)		WIP (Control)	
BB	DM-Wood	DM-Wood	CGM- Chairs
Purchases	DM-Fabric	DM-Fabric	CGM-Tables
	DM-Glass	DM- Glass	CGM-Bookshlves
	Indirect M	DL	
		FOH	
EB		EB	
Wages (Control)		FG	
	DL	CGM-Chairs	CGS-Chairs
	Indirect L	CGM--Tables	CGS--Tables
		CGM-Bookshelves	CGS-Bookshelves
Actual FOH (Control)		EB	
Indirect M			
Indirect L			
Rent (Factory)			
Depreciation			
TOTAL			

Application of FOH

$$\text{Allocation Rate} = \frac{\text{Actual Total FOH Incurred}}{\text{Actual Total Q. of Base Used}}$$

$$\text{Overhead allocated to cost object X} = \text{Overhead Rate} * \text{Act Q. used of base in object X}$$

FOH Allocated to Chairs =

FOH Allocated to Tables =

FOH Allocated to Bookshelves=

Subsidiary

WIP Chairs		WIP Tables		WIP Bookshelves	
BB		BB		BB	
DM-Wood	CGM	DM-Wood	CGM	DM-Wood	CGM
DM-Fabric		DM-Fabric		DM-Fabric	
DM- Glass		DM- Glass		DM- Glass	
DL		DL		DL	
Alloc. FOH		Alloc. FOH		Alloc. FOH	

Solution to Example 1 (Actual Costing System) {Figures are in Thousands}

RM (Control)		WIP (Control)	
BB	0	DM-Wood	152
Purchases	400	DM-Fabric	50
		DM-Glass	132
		Indirect M	45
EB	21	Alloc. FOH	128
		EB	0

Wages (Control)		FG (Control)	
DL	128	CGM-Chairs	350
Ind. L (40+10)	50	CGM--Tables	180
		CGM-Bookshelves	60
		EB	118

Actual FOH (Control)	
Indirect M	45
Indirect L	50
Rent (Factory)	15
Depreciation	18
TOTAL	128

Application of FOH

$$\text{Allocation Rate} = \frac{\text{Actual Total FOH Incurred}}{\text{Actual Total Q. of Base Used}} = \frac{128}{6.4} = \$20 \text{ per DL hour}$$

$$\text{Overhead allocated to cost object X} = \text{Overhead Rate} * \text{Act Q. used of base in object X}$$

FOH Allocated to Chairs = 20 x 5000 hrs = 100 k

FOH Allocated to Tables = 20 x 1000 hrs = 20 k

FOH Allocated to Bookshelves = 20 x 400 hrs = 8 k

Subsidiary

WIP Chairs		WIP Tables		WIP Bookshelves	
BB	0	BB	0	BB	0
DM-Wood	100	DM-Wood	40	DM-Wood	12
DM-Fabric	50	DM-Fabric	0	DM-Fabric	0
DM- Glass	0	DM- Glass	100	DM- Glass	32
DL	100	DL	20	DL	8
Alloc. FOH	100	Alloc. FOH	20	Alloc. FOH	8
EB	0	EB	0	EB	0

NORMAL Job-Order Costing System

In practice, the actual amounts spent on manufacturing overhead, and hence the actual application rate will not be known until the end of the accounting period. However, once a particular job is completed it should be delivered to the customer and its WIP should be closed. Thus, the actual costing system cannot be used in real world practice. Accordingly, companies adopt a normal costing system that estimates overhead during an accounting period by applying overhead to jobs using a predetermined rate.

Normal Costing System

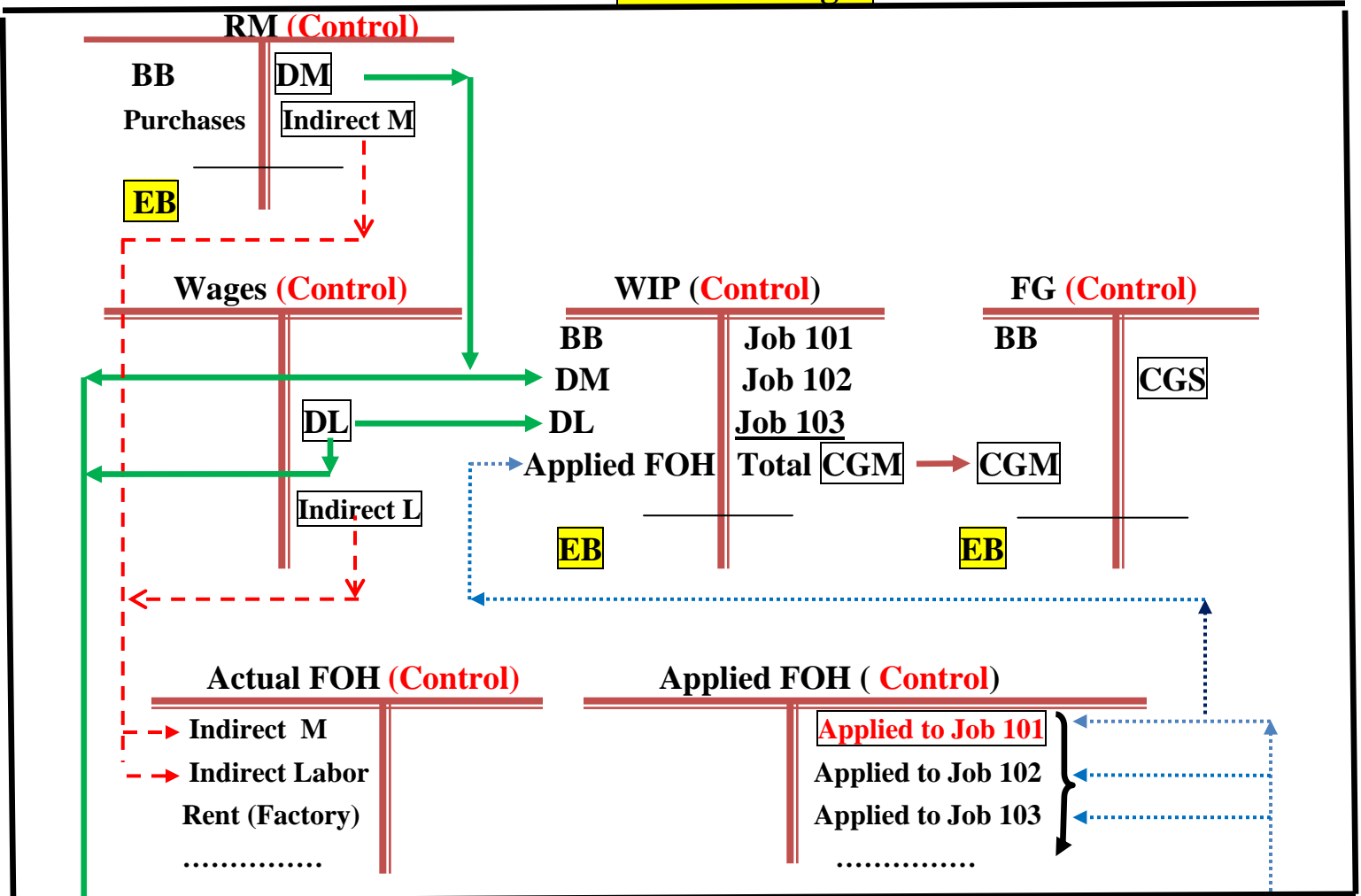
- a. For direct costs: Use of actual cost for tracing to cost object
- b. For indirect costs: Use of allocated cost based upon budgeted (pre- determined) indirect cost rates
- c. Need to adjust for differences between allocated costs based on budgeted rates and actual costs at year-end

The calculation and use of a predetermined rate is done in chronological order:

1. At the beginning of each year, management must choose an allocation base (i.e., a cost driver for overhead which is common to all jobs)..
2. Prepare a budget for yearly overhead costs and yearly volume of the cost driver
3. Calculate the predetermined application rate as follows:
$$\text{Application rate} = \text{budgeted total overhead} / \text{budgeted cost driver}$$
4. Obtain data on the actual cost driver spent or used in each job.
5. Apply overhead to each job as follows:
$$\text{Applied FOH} = \text{Actual Quantity used of the base on a specific job} \times \text{Application Rate}$$
6. At year end, account for difference between actual overhead costs and applied overhead costs

NORMAL Job-Order Costing System

General Ledger

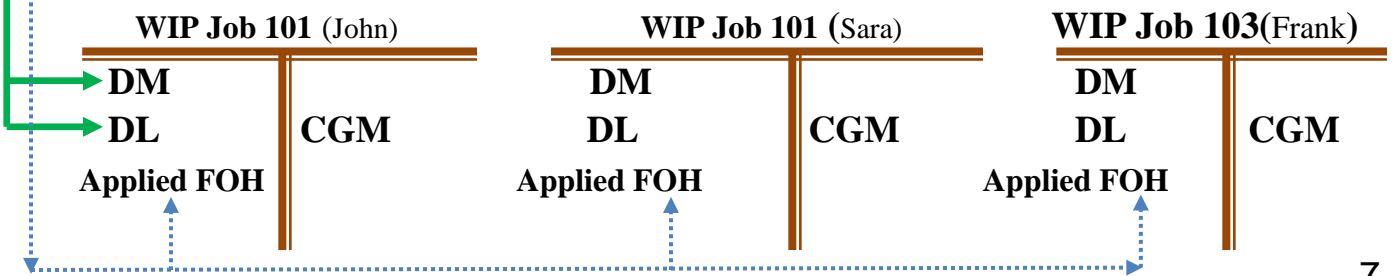


Application of FOH

$$\text{Predetermined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total amount of the allocation base}}$$

Overhead applied to Job 101 = Overhead Rate * Actual Q. of base used in Job # X

Subsidiary Ledger



Example 2: Redo Example 1 under **normal** costing system.

RM (Control)		WIP (Control)	
BB	DM-Wood	DM-Wood	CGM- Chairs
Purchases	DM-Fabric	DM-Fabric	CGM-Tables
	DM-Glass	DM- Glass	CGM-Bookshlves
	Indirect M	DL	
		Applied FOH	
EB		EB	
Wages (Control)		FG	
	DL	CGM-Chairs	CGS-Chairs
	Indirect L	CGM--Tables	CGS--Tables
		CGM-Bookshelves	CGS-Bookshelves
		EB	
Actual FOH (Control)		Applied FOH (Control)	
Indirect M		Appl. FOH-Chairs	
Indirect L		Appl. FOH-Tables	
Rent (Factory)		Appl. FOH-Bookshelves	
Depreciation			
TOTAL			

Application of FOH

Predetermined Allocation Rate = Estimated Total FOH / Estimated Total Q. of Base
=

Overhead allocated to cost object X = Overhead Rate * Act Q. used of base in object X

FOH Allocated to Chairs =

FOH Allocated to Tables =

FOH Allocated to Bookshelves=

WIP Chairs		WIP Tables		WIP Bookshelves	
BB		BB		BB	
DM-Wood	CGM	DM-Wood	CGM	DM-Wood	CGM
DM-Fabric		DM-Fabric		DM-Fabric	
DM- Glass		DM- Glass		DM- Glass	
DL		DL		DL	
Alloc. FOH		Alloc. FOH		Alloc. FOH	

Solution to Example 1 (Normal Costing System) {Figures are in Thousands}

RM (Control)				WIP (Control)			
BB	0	DM-Wood	152	DM-Wood	152	CGM- Chairs	
Purchases	400	DM-Fabric	50	DM-Fabric	50	CGM-Tables	
		DM-Glass	132	DM- Glass	132	CGM-Bookshlves	
		Indirect M	45	DL	128		
				FOH			
EB	21			EB	0		
Wages (Control)				FG			
		DL	128	CGM-Chairs		CGS-Chairs	
		Ind L (40+10)	50	CGM--Tables		CGS--Tables	
				CGM-Bookshelves		CGS-Bookshelves	
				EB			
Actual FOH (Control)				Applied FOH (Control)			
Indirect M	45			Appl. FOH-Chairs			
Indirect L	50			Appl. FOH-Tables			
Rent (Factory)	15			Appl. FOH-Bookshelves			
Depreciation	18						
TOTAL	128						

Application of FOH

$$\text{Allocation Rate} = \frac{\text{Estimated Total FOH}}{\text{Estimated Total Quantity of Base}}$$

$$\text{Overhead allocated to cost object X} = \text{Overhead Rate} * \text{Act Qt. used of base in object X}$$

Applied FOH to Chairs = x 5000 hrs = k

Applied FOH to Tables = x 1000 hrs = k

Applied FOH to Bookshelves = x 400 hrs = k

Subsidiary

WIP Chairs			WIP Tables			WIP Bookshelves		
BB	0		BB	0		BB	0	
DM-Wood	100	CGM	DM-Wood	40	CGM	DM-Wood	12	CGM
DM-Fabric	50		DM-Fabric	0		DM-Fabric	0	
DM- Glass	0		DM- Glass	100		DM- Glass	32	
DL	100		DL	20		DL	8	
Applied FOH			Applied FOH			Applied FOH		
EB	0		EB	0		EB	0	

Solution to Example 1 (Normal Costing System) {Figures are in Thousands}

RM (Control)				WIP (Control)			
BB	0	DM-Wood	152	DM-Wood	152	CGM- Chairs	360
Purchases	400	DM-Fabric	50	DM-Fabric	50	CGM-Tables	182
		DM-Glass	132	DM- Glass	132	CGM-Bookshelves	60.8
		Indirect M	45	DL	128		
				App.FOH	140.8		
EB	21			EB	0		
Wages (Control)				FG (Control)			
		DL	128	CGM-Chairs	360	CGS-Chairs	288
		Ind L (40+10)	50	CGM--Tables	182	CGS-Tables	145.6
				CGM-Bookshelves	60.8	CGS-Bookshelves	48.64
				EB	120.56		
Actual FOH (Control)				Applied FOH (Control)			
Indirect M	45			Appl. FOH-Chairs		110	
Indirect L	50			Appl. FOH-Tables		22	
Rent (Factory)	15			Appl. FOH-Bookshelves		8.8	
Depreciation	18						
TOTAL	128			TOTAL		140.8	

Application of FOH

<p>Allocation Rate = <u>Estimated</u> Total FOH / <u>Estimated</u> Total Q. of Base</p> <p>= 154 / 7 = \$22 per DL hour</p> <p>Overhead allocated to cost object X = Overhead Rate *Act Q. used of base in object X</p> <p>Applied FOH to Chairs = 22 x 5000 hrs = 110 k</p> <p>Applied FOH to Tables = 22 x 1000 hrs = 22 k</p> <p>Applied FOH to Bookshelves = 22 x 400 hrs = 8.8 k</p>

Subsidiary

WIP Chairs				WIP Tables				WIP Bookshelves			
BB	0			BB	0			BB	0		
DM-Wood	100	CGM		DM-Wood	40	CGM		DM-Wood	12	CGM	
DM-Fabric	50	360		DM-Fabric	0	182		DM-Fabric	0	60.8	
DM- Glass	0			DM- Glass	100			DM- Glass	32		
DL	100			DL	20			DL	8		
Applied FOH	110			Applied FOH	22			Applied FOH	8.8		
EB	0			EB	0			EB	0		

Disposal of Under/Over Applied Overhead

At the end of a period, there will be a difference between the actual total overhead and the applied overhead. This difference must be assigned to the jobs/product produced during the period. Unfortunately, at the end of the period, some of this product is in WIP, some is in FG and some is in COGS.

Since the predetermined overhead rate is based entirely on estimated data, the actual amount of overhead cost incurred will almost always differ from the amount of overhead cost that is applied to the Work In Process account. This difference is termed underapplied or overapplied overhead. If less overhead is applied to inventory than is actually incurred, then the difference is called underapplied overhead (it is also called underallocated overhead or underabsorbed overhead). If more overhead is applied to inventory than is actually incurred, then the difference is called overapplied overhead (it is also called overallocated or overabsorbed overhead).

There are two approaches to account for this error: Direct write off method and Proration method.

1. **Direct writ-off Method:**

The simplest approach is to close out the under- or overapplied overhead to CGS. To do so, follow the following steps:

- a. Close both the actual FOH account and the applied FOH account in a journal entry.
- b. The difference between the two sides of this journal entry captures the amount of over or under applied FOH.
- c. Charge the difference to the CGS. This causes the full amount of the adjustment to affect the income statement. In other words, under applied overhead would increase CGS and reduce net income and over applied overhead would reduce CGS and increase net income.

Example 3:

Assume that ABC Company's record show that the balance of the actual FOH and applied FOH at the end of 2010 were \$70,000 and \$65,800.

The adjusting entry at the end of 2010 is as follows:

Applied FOH	65,800	
CGS	\$4,200	
Actual FOH		\$70,000

2. Proration Method:

The second approach is to allocate the amount of misapplication to the EB (WIP), EB (FG) and CGS. The basis of allocation is the amount of overhead applied during the period in the ending balance of each of these accounts. Following are the steps to apply this method:

- a. Close both the actual FOH account and the applied FOH account in an adjusting entry.
- b. The difference between the two sides of this journal entry captures the amount of over or under applied FOH.
- c. Charge the difference to all the accounts that have been affected by the misapplication, namely WIP, FG, and COGS. The allocation is done on the basis of the weight or % of FOH-applied in each of the ending balances of the three accounts relative to the total FOH-applied in all three accounts.

Example 3-Continued:

Assume the ending balances of WIP, FG and CGS are as follows:

	<u>Ending Balances</u>	<u>Weight</u>	<u>Under/over application</u>	<u>Amount Allocated</u>
WIP	\$15,000	15%	4,200	630
FG	25,000	25%	4,200	1050
COGS	60,000	60%	4,200	2520
Total	<u>\$100,000</u>	<u>100%</u>		<u>4,200</u>

The adjusting entry at the end of 2010 is as follows:

Applied FOH	65,800	
CGS	2,520	
WIP	630	
FG	1,050	
	Actual FOH	\$70,000

Under this method part of the adjustment (the part relating to WIP and FG) goes to the Balance Sheet and does not affect the income statement. In this example, Net Income would be \$630 + \$1,050 = \$1,680 higher using this method (rather than closing it all to CGS) since \$1,680 of additional cost is kept out of the income statement.

The Effect of Under- and Overapplied Overhead on Net Operating Income.

If overhead is ***under-applied***, then less overhead has been charged to Cost of Goods Sold (and ending inventories of WIP and FG) than has actually been incurred. To adjust for this error, the amount of overhead underapplied must be added to Cost of Goods Sold (and perhaps ending inventories) to eliminate this error. In this case, omitting making the proper adjustment will result in overstating the true net income, and vice versa.

Journal Entries to Record Cost Flows in a Job-Order System

Following are the journal entries in the General Journal:

1. Purchase of RM

Raw-Material Inventory	XXXX	
Accounts Payable / Cash		XXXX

2. Using DM in Production

Work-in-Process Inventory (Control)	XXXX	
Raw-Material Inventory		XXXX

3. Using DL in Production

Work-in-Process Inventory (Control)	XXXX	
Wages Payable		XXXX

4. Incurrence of actual FOH

Manufacturing Overhead	XXXX	
Miscellaneous Accounts		XXXX

5. Applying FOH to Production

Work-in-Process Inventory (Control)	XXXX	
Manufacturing Overhead		XXXX

6. Transfer Produced Units to FG account

Finished-Goods Inventory	XXXX	
Work-in-Process Inventory		XXXX

7. Transfer the units sold to CGS

Cost of Goods Sold	XXXX	
Finished-Goods Inventory		XXXX

8. Recognition of the Sales of units

Accounts Receivable	XXXX	
Sales Revenue		XXXX

Practice Questions

Use the following to answer the next three questions

The Garnet Company uses a job-order cost system. The following data were recorded for February:

Job Number	<i>February 1</i>	<u><i>Added During February</i></u>	
	<i>Work in Process Inventory</i>	<i>Direct Materials</i>	<i>Direct Labor</i>
1	\$1,500	\$ 400	\$ 300
2	\$2,000	\$ 600	\$ 750
3	\$ 500	\$1,000	\$1,500
4	\$ 250	\$1,300	\$2,400

Overhead is charged to jobs at the rate of 140% of direct labor cost. Jobs 1, 2, and 3 were completed during February and transferred to finished goods. Job 3 has been delivered to the customer.

1. The manufacturing costs added to jobs during the month totaled:
 - A) \$ 8,250.
 - B) \$11,880.
 - C) \$12,500.
 - D) \$15,180.

2. The work in process inventory on February 28 was:
 - A) \$7,310.
 - B) \$9,500.
 - C) \$3,950.
 - D) \$7,060.

3. The cost of goods sold during February was:
 - A) \$ 5,100.
 - B) \$ 3,000.
 - C) \$12,120.
 - D) \$ 8,120.

Use the following to answer the next two questions:

Leija Manufacturing Company uses a job-order costing system and started the month of March with one job in process (Job #359). This job had \$500 of cost assigned to it at this time. During March, Leija assigned production costs as follows to the jobs worked on during the month:

	<i>Job #359</i>	<i>Job #360</i>	<i>Job #361</i>
Total cost assigned to jobs during March	\$6,000	\$8,100	\$2,400

During March, Leija completed and sold Job #359. Job #360 was also completed but was not sold by month end. Job #361 was not completed by the end of March.

4. What is Leija's cost of goods manufactured for March?
 - A) \$ 6,500
 - B) \$14,100
 - C) \$14,600
 - D) \$16,500

5. What is Leija's work in process inventory balance at the end of March?
- A) \$ 1,900
 - B) \$ 2,400
 - C) \$ 2,900
 - D) \$10,000

Use the following information to answer the next two questions

Hamilton Company uses job order costing. Factory overhead is applied to production at a predetermined rate of 150% of direct-labour cost. Any over or under-applied factory overhead is closed to the cost of goods sold account at the end of each month. Additional information is available as follows:

* Job 101 was the only job in process at January 31, 2002, with accumulated costs as follows:

Direct material	\$4,000
Direct labour	2,000
Applied factory overhead	<u>3,000</u>
	<u>\$9,000</u>

- Jobs 102, 103, and 104 were started during February.
- Direct materials requisitions for February totaled \$26,000.
- Total Direct-labour cost of \$20,000 was incurred for February.
- Total Actual factory overhead was \$32,000 for February.
- The only job still in process at February 28, 2002, was Job 104, with costs of \$2,800 for direct materials and \$1,800 for direct labour.

6. The cost of goods manufactured for February 2002 was:

- (a) \$77,700
- (b) \$78,000
- (c) \$79,700
- (d) \$85,000

7. Over or under-applied factory overhead should be closed to the cost of goods sold account at February 28, 2002, in the amount of:

- (a) \$ 700 over-applied
- (b) \$1,000 over-applied
- (c) \$1,700 under-applied
- (d) \$2,000 under-applied

Question	1	2	3	4	5	6	7
Answer	D	A	A	C	B	A	D