Unit 15
Master Budgeting Process II

ILO1. The Direct Materials budget
ILO2. The direct labor budget
ILO3. Manufacturing overhead budget.

ILO1. The direct materials budget

To give us a better understanding the direct materials budget we will use the following information, in an effort to quantify the raw materials that are needed to complete the production budget and facilitate inventory control.

- Aerial Company, required 5 pounds of raw materials per unit produced
- Standard operating procedures for Aerial Co. require 10% of materials on hand at the end of each month
- 13,000 pounds of material available at close of March 31st
- Materials come at a price of $0.40 per pound

To begin preparation of the direct materials budget you start by including the details regarding the required production for a single unit, from the production budget. The second step is to determine the periodic production needs; either monthly or quarterly. Third, is to determine the materials needed for purchases for the following month, in this case April (140,000). We make this assumption as the SOP was for a 10% inventory of materials to be available at the end of each month. When analyzing the tabular data, you will find the ending inventory for April equals 23,000, which is also the beginning inventory for May. Likewise, the beginning inventory for April; 13,000, corresponds with the ending inventory for March. We can take another step; fourth, to calculate the materials needed for purchase for May (221,500). The fifth step, is to calculate the materials needed for June (142,000).

	April	May	June	Quarter
Production	26,000	46,000	29,000	101,000
Materials per unit (pounds)	5	5	5	5
Production needs	130,000	230,000	145,000	505,000
Add: Desired ending inventory	23,000	14,500	11,500	11,500
Total needed	153,000	244,500	156,500	516,500
Less: Beginning inventory	13,000	23,000	14,500	13,000
Materials to be purchased	140,000	221,500	142,000	503,500

Fig 15.1 Direct Materials Budget

To add a variation to this process, we use the following information for Aerial Co. regarding its cash distributions.

- Aerial Co. has costs of $0.40 per pound for materials
- Half of a month's purchase is distributed for the month of purchase, the remaining half is distributed during the proceeding month

- March 31st accounts payable balance stands at $12,000

For this amendment we begin by calculating the payments by including the beginning accounts payable balance; from the tabular data below, we find it to be $12,000 in April. This amount will be paid in full in April. The second step, is to determine the April credit purchases that are necessary for each month; if using a quarterly analysis; $28,000 (56,000 x 50%) to be paid in April, and the remaining $28,000 to be distributed in May. The original $56,000 is found by calculating 140,000 pounds multiplied by $0.40. The third step is to calculate the May, and June credit purchases distributed during those months. For our example, the quarterly total amounts to $185,000.

	April	May	June	Quarter
Accounts payable 3/31	$ 12,000			$ 12,000
April purchases				
50% × $56,000	28,000			28,000
50% × $56,000		28,000		28,000
May purchases				
50% × $88,600		44,300		44,300
50% × $88600			44,300	44,300
June purchases				
50% × $56,800			28,400	28,400
Total cash disbursements	$ 40,000	$ 72,300	$ 72,700	$ 185,000

Fig 15.2 Cash Disbursement Budget

ILO2. The Direct Labour Budget

To begin the process of the direct labour budget we must first identify a few key characteristics.

- For Aerial company, each manufactured product requires 0.05 (or 3 minutes) of direct labour
- Unskilled labour is adequate as the training, and work involved is repetitive and does not require higher education
- Aerial company reimburses its workers at a rate of $10 per hour

The first step in preparing the direct labour budget requires we use the production in units taken from the production budget. Secondly, we calculate the direct labour hours needed for production. In the case of Aerial, it equates to 0.05 direct labour hours for every unit. The third step is to find the direct labour hours paid. Finally, the fourth step, is to determine the total direct labour costs.

	April	May	June	Quarter
Units of production	26,000	46,000	29,000	101,000
Direct labor time per unit	0.05	0.05	0.05	0.05
Labor hours required	1,300	2,300	1,450	5,050
Hourly wage rate	$ 10	$ 10	$ 10	$ 10
Total direct labor costs	$ 13,000	$ 23,000	$ 14,500	$ 50,500

Fig 15.3 Direct Labour Budget

ILO3. Manufacturing Overhead Budget

For the third and final budget we again use information relating to Aerial company.

- Manufacturing overhead is used for all units of production based on direct labour hours
- Variable manufacturing overhead rate is set to $20 per hour of direct labour
- WE also use fixed manufacturing overheads of $50,000 each month, which includes $20,000 from noncash costs

The first step in this process it to calculate the variable manufacturing overhead costs for each month. This information is found from the direct labour budget. Secondly, we include the fixed manufacturing overhead costs of $50,000 to the variable overhead costs. This provides us the required information to determine the predetermined overhead rate for the quarter ($49.70). Next, is to find the distributions for manufacturing overhead by subtracting noncash expenses from the total manufacturing overhead costs that was found previously. For Aerial Co. $20,000 of depreciation value is subtracted from each month's total overhead costs. This gives us the final cash disbursements for manufacturing overhead costs.

	April	May	June	Quarter
Budgeted direct labor hours	1,300	2,300	1,450	5,050
Variable mfg. OH rate	$ 20	$ 20	$ 20	$ 20
Variable mfg. OH costs	$ 26,000	$ 46,000	$ 29,000	$ 101,000
Fixed mfg. OH costs	50,000	50,000	50,000	150,000
Total mfg. OH costs	76,000	96,000	79,000	251,000
Less: noncash costs	20,000	20,000	20,000	60,000
Cash disbursement for mfg. OH	$ 56,000	$ 76,000	$ 59,000	$ 191,000

Fig 15.4 Manufacturing Overhead Budget

To take this process a step further, we begin looking at the ending finished goods inventory budget. We follow a similar process with our preceding budgets, by calculating the direct materials cost per unit, $2.00. Next, we find the direct labour cost per unit, by visiting the direct labour budget; ($0.50). Our next step is to calculate the manufacturing overhead cost per unit ($2.49), and the total inventory cost per unit of $4.99. For our example Aerial Co. uses an absorption costing system to detail its inventory. Manufacturing overheads and direct labour are the same; ($0.05) because direct labour hours is used as the overhead allocation base. We also the manufacturing overhead budget to find the predetermined overhead rate. The fourth step is find the ending finished goods budget inventory ($24,950). This amount is also found by using the production budget and calculating the inventory in units (5,000).

Production costs per unit	Quantity		Cost	Total
Direct materials	5.00	lbs.	$ 0.40	$ 2.00
Direct labor	0.05	hrs.	$10.00	0.50
Manufacturing overhead	0.05	hrs.	$49.70	2.49
				$ 4.99
Budgeted finished goods inventory				
Ending inventory in units				5,000
Unit product cost				$ 4.99
Ending finished goods inventory				$24,950

Fig 15.5 Ending Finished Goods Inventory

References:

1. Managerial accounting, Ray Garrison-Eric Noreen-Peter Brewer - McGraw-Hill Education, 16 ed., 2018
2. Managerial accounting, John Wild-Ken Shaw - McGraw-Hill Education, 7ed, 2019
3. Management accounting, Will Seal-Carsten Rohde-Ray Garrison-Eric Noreen - McGraw-Hill Education, 6ed. - 2019