CHAPTER 10

Standard Costing & Variance Analysis

Standard Costing is an important control technique by which costs of products or services are pre-determined and then they are compared with the actual costs incurred to identify variances.

Standard Costing establishes predetermined estimates of the cost of products or services, collect actual costs and output data and compares them with the predetermined estimates. The predetermined costs are known as standard costs and the difference between standard and actual is referred to as a variance.

The process of tracing the reasons for these differences/variances is known as the "Variance Analysis".

However, the greatest (Maximum) benefit is gained when the manufacturing process involves a substantial degree of repetition.

1. Standard Cost and Standard Costing

1.1 Standard Costs

Standard Costs are the pre-determined costs or target costs that should be incurred under given/certain operating conditions.

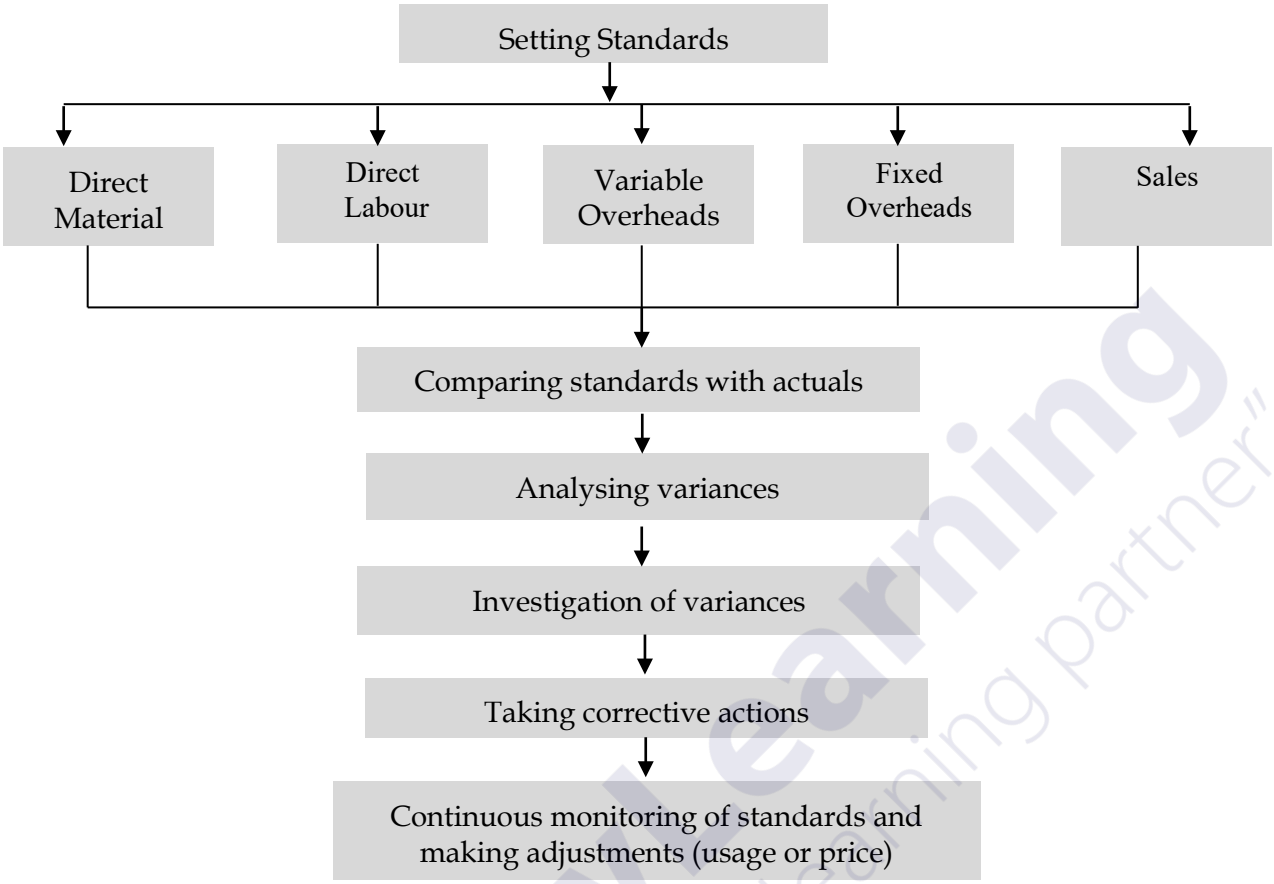
Standard costing can broadly be defined as a technique which establishes predetermined estimates of the costs of products/services, compares them with actual costs incurred in order to find out variances and takes necessary measures to control such variances.

1.2 How does a Standard Costing System Operate?

As already mentioned above, a Standard Costing System is most suitable for organizations whose activities consist of a series of common operations and are repetitive in nature.

However in practice, this is widely used by manufacturing concerns because their manufacturing process often involves activities in repetitive nature. Standard costing is less beneficial for organizations where activities are of nonrepetitive nature, due to the practical difficulties to be encountered in establishing standards and waste in terms of cost and time factors.

Operation of a Standard Costing System



A Standard Costing System can be applied to organizations which produce many different products as long as production consists of a series of common operations.

1.3 Setting Standards

To set realistic standards, there should be properly organized methods, procedures and a comprehensive information system within the organizations. ie. If the production method is not decided upon, useless the effort of setting standards. The set standards should cover every single element which contribute to the product. For example, the types, usage, prices, the grades, time and rate of pay, production methods, lay out tools and so on. The standards so established should be kept up to date, to avoid getting them outdated.

The set standard is documented by way of a standard cost card (or standard cost sheet), that might be just a card or a computerized sheet. The standards are established on following elements.

(1) Direct Materials - Types

- Usage

- Prices

(2) Direct Labour - Grades

- Time / Usage

- Rates

(3) Overhead costs (variable and fixed)

- Absorption rates ------- etc.

(4) Sales - Price

- Quantities and Mix

- Margin (Profit)

1.4 Objectives of a Standard Costing System

A Standard Costing System is widely used by organizations to achieve many different objectives.

(1) To provide a rational/formal basis for assessing performance and efficiency of managers, divisions and the organization as a whole.

(2) To control costs by establishing standards and analyzing variances.

(3) To enable the principle of "Management by exception" (MBE) to be practiced at the middle and operational levels. (a style of business management that focuses on norms and deviations from them)

(4) To assist in setting budgets (in compiling budgets) and estimates.

(5) To use for stock valuations.

(6) To use for profit planning and decision making.

(7) To use as a basis of pricing where "costs plus " systems are used.

(8) To assist in assigning responsibilities for non-standard performance/ substandard performance (below the usual or required standard) in order to correct deficiencies.

(9) To motivate Staff and Management.

(10) To provide guidance on possible ways of improving performances.

1.5 Standard Cost Card/ Sheet

The process of setting standards, finally results in the establishment of the standard cost for the product or unit of service. Once all the standard costs elements are determined, they should be recorded on a "standard cost card/sheet".

In practice, there may be numerous (ie. consisting of many) detailed cards together with a summary card for a given product. The standard cost card may be just a card or it may be on a computerized file. (the principles, however, remain the same)

A simple, but not specific, standard cost card of a product is set out below.

Standard Cost Card

Product code : Ey 395 — Batch Quantity : 2,000 pieces

Description : Fibre Mould — Drawing No. : D 236

Work Study Reference : WS 215/Jan. — Sample Reference : Jerome – USA

Cost Type	Quantity	Standard Price (Rs.)	Cost (Rs.)	Total Cost (Rs.)
Direct Materials				
RM 01	12Kg	10	120	
RM 02	3Kg	5	15	135
Direct Labour				
Grade 01	6 hrs	15	90	
Grade 02	3hrs	10	30	120
Production Overheads				
Grade 01	6hrs	5	30	
Grade 02	3hrs	5	15	45
TOTAL COST				300
Standard Profit Margin				60
Standard Price				360

1.6 Advantages / Uses of Standard Costing

A standard costing system has numerous advantages for a formal business entity. Following are among them.

(1) It helps the management in formulating pricing and production policies.

(2) It acts as a yardstick of performance. ie. standard costs are compared with actual costs, the variances are analysed and effective cost control measures are taken

(exercised). Thus increasing the profits is possible by reducing and controlling the costs.

(3) It reduces avoidable wastage and losses.

(4) It facilitates to reduce clerical/accounting/administrative costs and the time of the Management.

(5) It creates consciousness of cost control among the personnel, because it fixes standards for their activities and then measures their performance by analyzing variances. (both favourable and adverse)

(6) It makes Executives and above, become more responsible as it shows clearly who is responsible for the cost centres.

(7) By analyzing and reporting variances, the principle of "Management by exception" is practiced. ie. Management must concentrate/pay their attention on variations only.

(8) It aids in Budgeting and forecasting.

(9) It assists the Management in decision making.

(10) It sets a uniform policy for stock valuations. Organizations, where a standard costing system is operative, value their stocks at standard price (if raw material) or standard cost (if work in progress and finished goods)

(11) It facilitates to generate timely cost reports and operating statements (or performance reports) to the management.

(12) Establishment of standards co-ordinates all functions; Production, Marketing, Engineering, Research and Development (R & D), procurement, Human Resources, Accounting & Finance towards the achievement of common goal.

(13) Establishment of standards means, setting goals and targets. Every individual is working to attain the goals and targets.

(14) Standards are a form of incentive system to employees. If set standards are reasonable, agreeable and attainable, they act as an incentive system to the employees causing to improve their performances and to maintain the quality of the products.

(15) Standards motivate workers , supervisors, and foremen to work more efficiently in the accomplishment of their respective standards.(ie. a self motivation system).

1.7 Disadvantages / Drawbacks or limitations of standard costing

A standard costing system may have a number of disadvantages too.

(1) It may be costly and time consuming to install and to maintain as an up to date system, since it requires high technical skills.

(2) Certain staff may be incapable of operating this system.

(3) Due to the difficulties in setting correct standards, it may be difficult to ascertain/work out correct variances.

(4) Industries which are subject to frequent changes need constant (occurring continuously) revisions of standards. Revisions may be costly as well as time consuming.

(5) For small business concerns, establishment and maintaining a standard costing system is not cost effective (not affordable).

(6) A standard costing system may not be effective for business whose products are non-standardized or customer specific. (customized)

1.8 Types of standards

Based on two principles; attainability and frequency of revisions, it is possible to classify standards in to four main categories/types.

(a) Basic standards
(b) Ideal standards
(c) Attainable standards
(d) Current standards

(a) Basic Standards

These are long term standards which could remain unchanged over the years. In other words, Basic standards are established to be used for a long period of time. Hence they are seldom revised or updated to reflect current levels. Also, they could be used as a basis for setting current standards. Basic Standards would not normally form part of the reporting system as any variances produced would have little or no meaning since they are far from current levels.

(b) Ideal Standards

These standards are also known as "Perfect Standards" or "Maximum Efficiency Standards". They are based on the best possible operating conditions.

When we establish these types of standards, we assume that, no machine breakdowns, no material wastages, no stoppages or idle time, no stock outs will occur. Everything will be with perfect efficiency.

These Standards are extremely tight and therefore they do not provide rooms for any losses, wastages, spoilages, idle time, machine break downs, production stoppages ……. etc. So that, ideal standards will always result in adverse variance since certain losses are there which are unavoidable. Ideal Standards will therefore cause the management/employees to be demotivated. In practice, ideal standards are rarely used

for comparison purposes. Ideal Standards would be adjusted periodically to reflect improvement in materials, methods and technology. These standards would be unattainable in practice, and accordingly ideal standards are unlikely to be used for reporting purposes. Since they generate continually adverse variances, they are likely to affect the morale and motivation of employees. Ideal Standards may however be considered as long term targets but are of little value for day to day control activities.

(c) Attainable Standards

Attainable standards are the most frequently used standards in practice. They are based on efficient operating conditions but not on perfect. When these standards are established, they may include allowances for losses, idle time, and machine break downs …….. etc. For comparison purpose in practical scenarios, attainable standards are frequently used. They will result in adverse as well as favourable variances.

These types of standards are revised on periodical basis to reflect the prevailing conditions. Attainable standards should be based on high performance levels which can, with effort, be achieved, such standards are aimed at to provide tough but realistic targets and therefore they will lead to motivate staff.

Attainable standards are the ones normally used for routine control purposes and from which variances are calculated. Therefore, in practical circumstances, standards mean attainable standards. Therefore these are by for the most (far and away) commonly encountered standards.

(d) Current Standards

These are the standards which are set for use over a short period to reflect current conditions. Current standards are short term standards and they are revised at short regular intervals.

Where conditions are stable, then the current standards will be the same as attainable standards.

Current standards could be set for one, two or three months to deal with particular circumstances such as a temporary problem exists with the quality of materials, or unexpected price rise …….. etc.

1.9 Standard Costing Vs. Budgeting

Both standard costing and budgeting aim at the maximum efficiency and managerial control. Standard Costing and Budgeting also target cost control by establishing pre-determined standards. Without a standard costing system, preparation of Budgets or exercising a budgetary control system are not possible.

1.9.1 Standard Costing and Budgeting Comparison

Both standard costing and Budgeting are vital tools in planning, operating and controlling a business enterprise. However there are a few differences as noted below.

Budgeting	Standard Costing
(1) It is extensive (wide spread) in its application, as it deals with the operation of departments or business as a whole.	(1) It is intensive (limited to a certain place or activity), as it is applied to manufacturing of product or providing a service.
(2) Budgets are prepared for sales, production, cash ……etc.	(2) The effort is to pre-determine the cost per unit.
(3) Budgets can be applied in parts (as in above 2)	(3) Variances are applied as a whole.
(4) It is comparatively more expensive and broad in nature, as it relates to production, sales, finance …….etc taking as a whole.	(4) It is not so expensive, compared to budgeting because it relates to the cost of the product.
(5) Budgets can not be operated without standards.	(5) Standard costing system is operated independently.

2. Possible issues in implementing a standard costing system in modern organizations

Standard Costing systems were to develop as a part of the planning process of businesses. However, according to the experts in the planning field, the usefulness of "Standard Costing and Variance Analysis" for a modern organization is in a question. Some of them have predicted the demise (the end or failure of it) of this due to the following reasons.

(1) It is not compatible with the changing cost structure.

(2) It is not consistent (is inconsistent) with the modern management approaches.

(3) It over emphasizes the importance of Direct Labour.

(4) It involves delays in feed back reporting.

It is further argued that, the conventional standard costing system is of limited value in modern scenarios on following points,

(1) Variances are analyzed on weekly basis or sometimes monthly basis consequently there is a considerable delay or time gap between the actual

event and the information on its performance. This is not acceptable by modern organizations.

(2) Standard Costing system over emphasizes the importance of direct labour, which is nowadays less important because it represents a small proportion of the total cost of the product or service.

(3) It concentrates only on a narrow range of financial factors such as price, usage, mix…….. etc and it ignores many other important factors such as quality, lead time, customer satisfaction, employees' welfare ……. etc.

(4) Some variances may give wrong signals to the authority responsible for that variance. For example, if material price variance is favourable, the purchasing manager would be appreciated and then he would be compelled to buy on price factor alone to avoid adverse variances. This may lead to overstocks, poor quality and irregular deliveries.
However, world class manufacturers nowadays use modern techniques such as computer assisted "Advanced Manufacturing Technology" (ATM) and "Just in Time" (JIT). Traditional standard costing system works against the objectives of AMT and JIT. For example, AMT and JIT basically concentrates on quality, reliability and on time deliveries and not merely the price.

(5) At present, many variances are of little or no value for short term cost control because, most of expenses are fixed in nature (are in fixed nature). For example, in situations where labour costs are almost fixed, labour variances do not bring any meaning.

(6) In a traditional standard costing system, it emphasizes that the organization should always set targets and all measures to be taken to achieve those targets, whereas AMT and JIT stand on the continuous improvements. To maintain the continuous improvements, a range of realistic performance measures such as quality, delivery time, defects found……. etc. are to be reported over time, so that trends in performance can be measured in time.

3. Variance Analysis

3.1 Budgeted Profit, Actual Profit and Variance Analysis

Budgeted profit for a period (or for an order) is arrived at by preparing the budgeted profit and loss account, which is a part of the Master Budget.

Say, for example, it is Rs. 1,000,000. This budgeted profit is forecasted before the commencement of the period (or the order) for which the budget is prepared. This is basically worked out by the management accountant with the guidance of the Head of Finance and further directions of the budget committee.

Once the period (probably a year) for which the Budget is related is over or the order for which the budget is prepared is concluded, the Financial Accountant works out the actual profit earned for the period (or on the order). Assume, for example, it was Rs. 800,000.

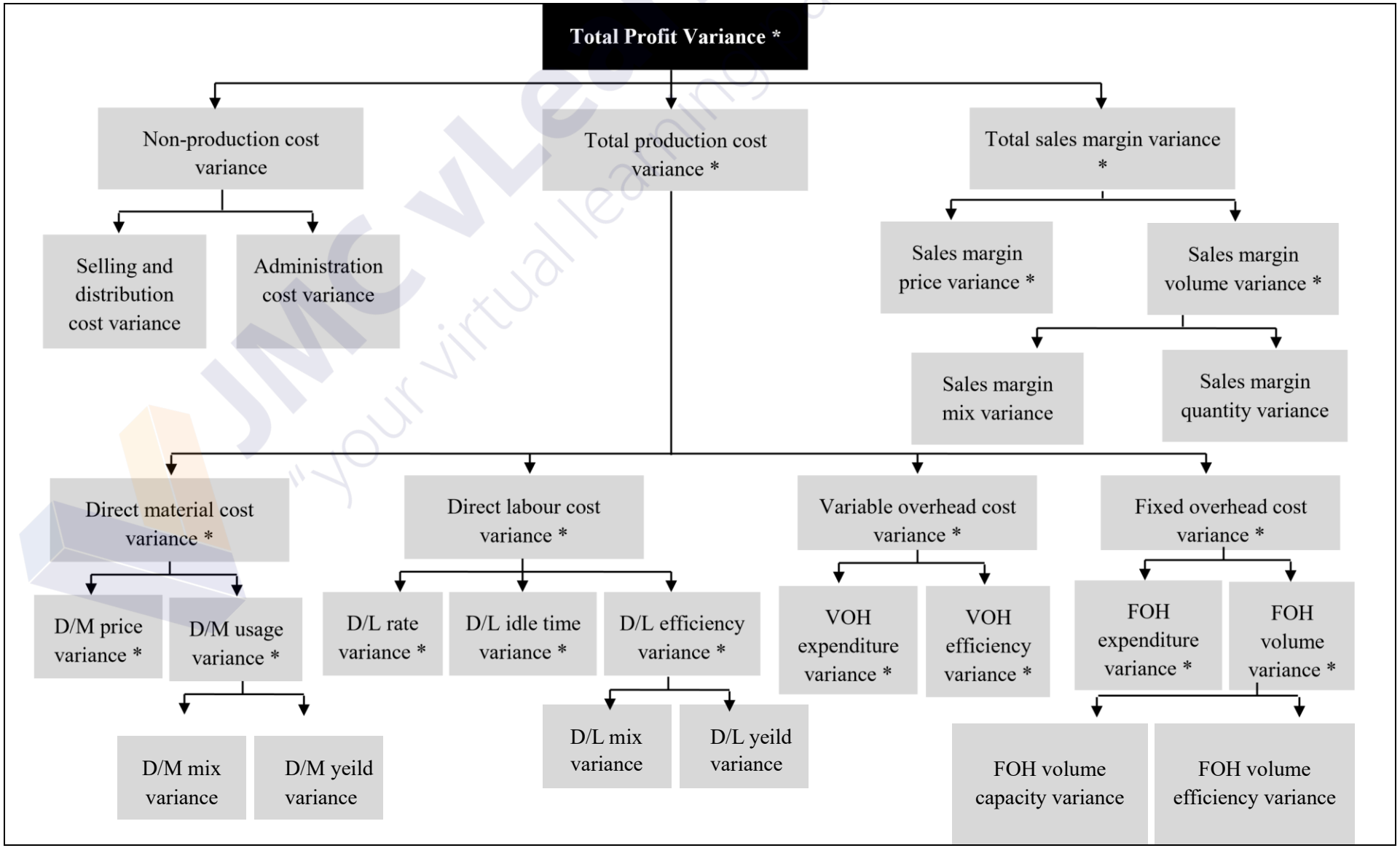
	Rs.
Total budgeted profit (forecasted)	1,000,000
Total actual profit (earned)	800,000
∴ Total profit variance	(200,000)

In the above example, the total profit variance is Rs. 200,000, an adverse variance. This is the summation (ie. summarized total) of all variances occurred during the period (or in respect of the particular order).

Total Profit Variance = Actual Profit – Budgeted Profit

The top management or the Board of Directors (BOD) would be interested to know the reasons, in detail for the difference between the Budgeted profit and the Actual Profit, ie. for the profit variance. It is the responsibility/duty of the management accountant to prepare and submit to the BOD, a statement reconciling these two profits by including all variances caused for the difference in profits. This reconciliation should analyze the variances in to sub variances to the maximum possible. This statement is referred to as "Profit Reconciliation Statement" or "the Variance Report" or else the operating statement". (This will be discussed later in this chapter).

In order to prepare this profit reconciliation, the Management Accountant is to analyze each and every reasons, to the maximum possible, caused for the difference. Such analysis is called "Variance Analysis". Following figure sets out/exhibits, how these variances are categorized.



It is to be noted that;

(1) Not all the variances in the chart, but only the variances marked with asterisk (*) will be checked for Chartered Accountancy – Business Level II.

(2) The variances depicted in the chart are the variances generally analysed by a manufacturing concern.

3.2 Why do we analyse variances?

The main purpose of analyzing variances is to find out the reasons for off standard (or substandard) performance, so that the management can take remedial actions to improve operations, increase efficiency, utilize resources more effectively and reduce costs.

3.2.1 The Inter-relationship between variances

As already explained in the above paragraph, the overall objective of variance analysis is to explore the reasons, to the maximum possible, for the total difference between, the budgeted profit and the actual profit of the period. The above chart shows the hierarchy of variances, analyzed by a manufacturing concern.

Each and every variances are analyzed in to its price and quantity aspects, as shown below.

Element	Price aspect	Quantity aspect
Direct material	Price	Usage
Direct labour	Rate	Efficiency
Variable overheads	Expenditure	Efficiency
Fixed overheads	Expenditure	Volume
Sales margin	Price	Volume

4. Total Profit Variance

The total profit variance, also knows as the Operating Profit Variance is the summation /total of all the costs and sales variances. It is the difference between Budgeted Profit and Actual Profit for the period.

Total Profit Variance = Total Actual Profit - Total Budgeted Profit

Total actual profit : Is the profit shown in the actual profit and loss account prepared by the financial accountant.

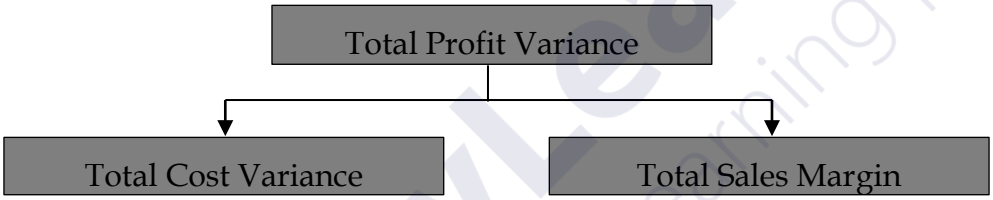
Total budgeted profit : Is the profit shown in the budgeted profit and loss account prepared by the management accountant. (Master budget)

OR

- Total budgeted profit = Budgeted profit per unit x Budgeted sales quantity
- Budgeted profit per unit = Budgeted selling price - Budgeted cost per unit

Budgeted cost per unit means the standard cost per unit.

The total profit variance is the net effect of total cost variances and total sales variances.



4.1 Total Cost Variance

Total cost variance is analyzed to find out the effect of costs on the total profit variance. This is the difference between the 'standard cost of the actual production' and the 'actual cost incurred'. i.e. as a formula;

Total Cost Variance	=	**Standard Cost of Actual Production**	–	**Actual Cost Incurred**

Standard Cost of actual production	=	Standard cost per unit	x	Actual units produced

4.1.1 Direct Material Cost Variance

This is the total effect of direct material costs on the profit variance. Direct material cost variance is the difference between the standard direct material cost of the actual production and the actual direct material costs. i.e. as a formula;

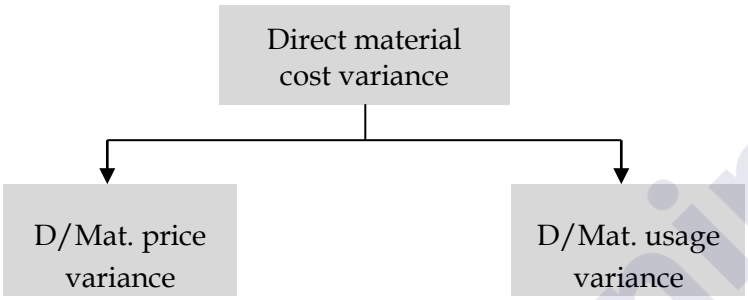
Direct material cost variance	=	**Standard D/material cost of actual production**	–	**Actual D/material costs**

 Standard D/Mat. cost = Standard D/mat. Cost per unit x Actual production

Direct material cost variance is the summation of following variances (sub divisions)

(1) Direct material price variance (Price aspect)

(2) Direct material usage variance (Quantity aspect)



(1) Direct material price variance:

This is the price aspect of direct material cost variance. Direct material price variance occurs when raw materials are purchased at a price different from standard price. As a formula;

Direct material price variance = **Quantity purchased** (**Standard price** – **Actual price**)

If standard price > actual price Favourable variance

If standard price < actual price Adverse variance

- It is advisable that, the direct material price variance should be calculated at the time of purchasing materials, rather than when they are used.

(2) Direct material usage variance:

This is the quantity aspect of direct material cost variance. The direct material usage variance occurs when the standard quantity that should have been used to produce the actual out put differs from the actual quantity of raw materials used in production. As a formula;

Direct material usage variance = **Standard price** (**Standard qty. for actual production** – **Actual qty. used**)

- Standard quantity = Std. qty. per unit x Actual production

If standard usage > actual usage Favourable variance

If standard usage < actual usage Adverse variance

Example: (1)

Compute all direct material cost variances from the following information: Standard material cost per unit.

3 Kgs @ Rs. 10/-	30

Actual production : 1,000 units completed

Actual purchases : 2,950 Kgs at Rs. 11 per Kg

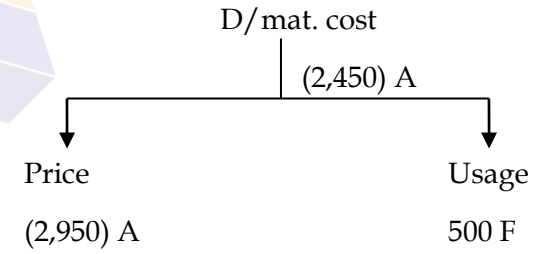
- No. raw material stocks are maintained.

Answer

- D/mat. cost variance = Standard D/mat. cost - Actual D/mat cost
  = (30 x 1,000) - (2,950 x 11)
  = 30,000 - 32,450
  = (2,450) Adverse

- D/mat. price variance = Qty. purchased (Std. price - Act. Price)
  = 2,950 (10 - 11)
  = (2,950) Adverse

- D/mat. usage variance= Std. price (Std. usage - Act. Usage)
  = 10 (1,000 x 3 - 2,950)
  = 500 Favourable



Possible Reasons for Direct Material Cost Variances

R/Mat. Price Variance	
Favourable	**Adverse**
Standard Price > Actual Price - Purchase of inferior quality materials - General price decrease in the market - Enjoying unexpected quantity discounts - Using substitutes at low prices - Special negotiating skills of purchasing department	**Standard Price < Actual Price** - Purchase of high quality materials - General price increase in the market - Failure to enjoy expected quantity discounts - Using substitutes at high prices - Failure of purchasing department to negotiate at low prices.

- Raw material price variance is mainly a responsibility of the purchasing/procurement manager.

R/Mat. Usage Variance	
Favourable	**Adverse**
Standard Usage > Actual Usage - Proper handling of materials - Use of high quality materials - Use of high quality labour - Rapid changes in quality controls - Changes in production methods - Minimum production stoppages	**Standard Usage < Actual Usage** - Careless handling of materials - Purchase of inferior quality materials - Pilferage - Changes in quality controls - Changes in production methods - Use of inferior quality labour - Unexpected production stoppages

- Raw material usage variance is mainly a responsibility of the production manager of the relevant plant.

4.1.2 Direct Labour Cost Variances

This is the total effect of direct labour costs on the profit variance. Direct labour cost variance is the difference between the standard direct labour cost of the actual production and the actual direct labour costs incurred. i.e. as a formula;

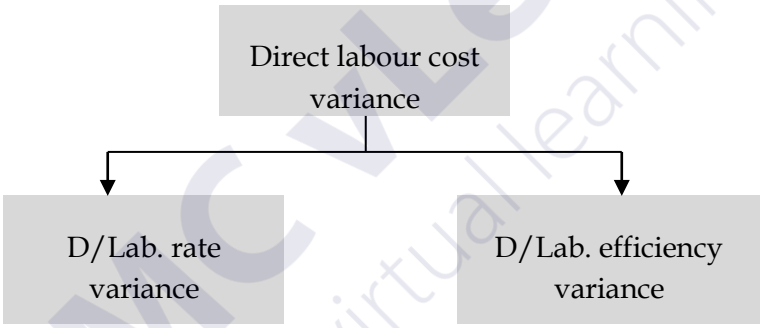
Direct labour cost variance	=	**Standard D/lab. Costs of actual production**	−	**Actual D/lab. Costs**

- Standard D/lab. cost of actual production = Std. D/lab. Cost per unit x Actual production qty.

Direct labour cost variance is the summation of following variances (sub divisions)

(1) Direct Labour Rate Variance (Price aspect)

(2) Direct Labour Efficiency Variance (Quantity aspect)



(1) Direct Labour Rate Variance :

This is the price aspect of direct labour cost variance. When actual direct labour hour rate differs from the standard rate, the result is a labour rate variance. As a formula;

D/lab. rate variance	=	**Actual hours paid**	(	**Standard rate**	−	**Actual rate**)

If standard rate > Actual rate ⇒ Favourable variance

If standard rate < Actual rate ⇒ Adverse variance

(2) Direct Labour Efficiency Variance

This is the quantity aspect of direct labour cost variance. Direct labour efficiency variance occurs when the standard number of hours specified for the actual production differ from the actual direct labour hours worked. As a formula,

D/lab. efficiency variance = Standard rate per hour (Std. hours of actual production – Actual hours worked)

- Std. hours of actual production = Std. hours per unit x Actual production

If standard hrs. > Actual hours worked Favourable variance

If standard hrs. < Actual hours worked Adverse variance

Example: (1)

Compute all direct labour cost variances from the following information. Standard labour cost per unit

2 hrs @ Rs. 5/ = 10

Actual production : 2,500 units completed

Actual labour paid : 5,150 hours at Rs. 5.60

Answer:

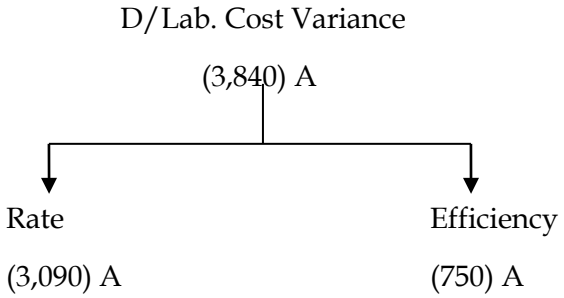
- D/Lab. cost variance = Standard D/lab. cost - Actual D/lab. cost
  = (2,500 x 10) - (5,150 x 5.60)
  = 25,000 - 28,840
  = (3,840) Ad.

- D/Lab. rate variance = Actual hrs. paid (Std. rate - Actual rate)
  = 5,150 (5 - 5.60)
  = (3,090) Ad.

- D/Lab. efficiency variance = Std. rate (Std. hrs. - Actual hrs. Worked)

  = 5 (2,500 x 2 - 5,150)

  = (750) Ad.



Possible Reasons for Direct Labour Cost Variances

D/Labour Rate Variance	
Favourable	**Adverse**
Standard rate > Actual rate	**Standard rate < Actual rate**
- Assignment of unskilled labour - Subsequent negotiations (rare)	- Post negotiations to increase wages • Unexpected over time • Assignment of high skilled labour • Sudden changes in labour law

- The labour rate variance is the responsibility of HR manager and foreman.

D/Labour Efficiency Variance	
Favourable	**Adverse**
Standard hours > Actual worked hrs.	**Standard hours < Actual worked hrs.**
Use of high quality materials	Use of inferior quality materials
Use of high quality labour	Use of inferior quality labour
Using different grades of labour	Using different grades of labour
Introduction of new equipment and tools.	Failure to maintain machinery in proper condition
Changes in the production process	• Introduction of new equipment and tools
	• Changes in the production process

✓ For the labour efficiency variance, the production manager or the foreman is mainly responsible (or may be of another department. Eg: planning, quality control etc.)

4.1.3 Variable Overhead Cost Variances

This is the total effect of variable overheads on the profit variance. Variable overhead cost variance is the difference between the standard variable overhead costs allowed for the actual production and the actual overhead costs incurred. As a formula;

V/O/head cost variance = Standard V/O/head costs – Actual V/O/head costs

- Standard V/O/heads = VOH rate per unit x Actual output

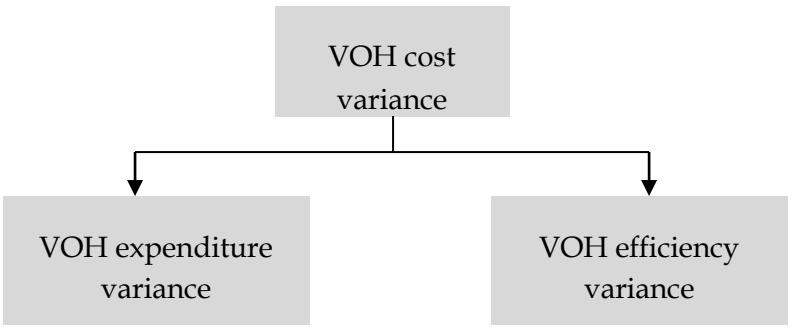
OR

- Standard V/O/heads = VOH absorption rate per hour x Standard hours of actual output

Variable overhead cost variance is the summation of following variances. (Sub divisions)

(1) Variable overhead expenditure variance (Price aspect)

(2) Variable overhead efficiency variance (Quantity aspect)



(1) Variable Overhead Expenditure Variance:

This variance indicates the difference between the budgeted variable overheads based on actual hours worked (ie. allowable VOH) and the actual overheads incurred. As a formula;

VOH expenditure variance	=	**Budgeted VOH based on actual hours**	–	**Actual VOH incurred**

- Budgeted VOH based on actual hours = Allowed VOH
- Allowed VOH = VOH absorption rate per hour x Actual hours worked

Usually variable overheads are incurred during active working hours (Operational hours) only, not incurred during idle time.

(2) Variable Overhead Efficiency Variance :

This variance is like labour efficiency variance. VOH efficiency variance arises when standard hours required for the actual production differ from the actual hours worked. As a formula;

VOH efficiency variance	=	**Standard VOH absorption rate per hour**	(	**Std. hrs. for actual production**	–	**Actual hrs. worked**	)

- Absorption rate per hour = $\frac{\text{Budgeted VOH}}{\text{Budgeted hours}}$

- Std. hrs. for actual production = Std. hrs. per unit x Actual output

- Actual hours worked :

  If VOH are absorbed as per direct labour hours, "Actual hours worked" means the actual labour hours worked.

Example: (1)

Compute all variable overhead cost variances from following information.

Budgeted variable overheads per week	Rs. 8,400
Budgeted production per week	1,200 units
Standard working hours per week	40
Actual production for last week	1,155 units
Actual variable overheads for last week	Rs. 8,350

Answer:

Workings:

- VOH absorption rate per unit = $\frac{Rs.8,400}{1,200}$ = 7

- VOH absorption rate per hour = $\frac{Rs.8,400}{40}$ = 210

- Standard production per hour = $\frac{1,200}{40}$ = 30 Units

- Standard hours for actual production = $\frac{1,155}{30}$ = 38.5

- Std. VOH Costs = 7 x 1,155

= 8,085

OR

St. VOH Costs = 210 x 38.5

= 8,085

- As there is no idle hours,

  Budgeted hrs per week = Actual hours worked

- VOH cost variance = Std. VOH - Actual VOH

  = 8,085 - 8,350

  = (265) A

- VOH expenditure variance = Allowed VOH - Actual VOH

  = 210 x 40 - 8,350

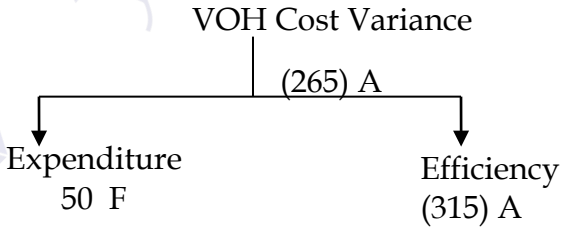
  = 8,400 - 8,350

  = 50 F

- VOH efficiency variance = VOH ab. Rate per hour (Std. hrs. of actual production - Actual hrs. worked)

  = 210 (38.5 - 40)

  = (315) A



Possible reasons for VOH Cost Variances

A big effort is required to identify the clear reasons for VOH cost variances, as variable overhead represents the aggregation of a large number of individual items, such as indirect labour, indirect materials, electricity, maintenance and so on. In general, variable overhead variances can arise due to following reasons; When prices of individual items have changed.

- How efficiently those items are used.
- Waste or inefficiency such as using more kilowatt-hours of power.
- Inefficiency of labour.

4.1.4 Fixed Overhead Cost Variances

This is the total effect of fixed overheads on the profit variance. Fixed overhead cost variance is the difference between the standard fixed overhead costs allowed for the actual production and the actual overhead costs incurred. As a formula;

FOH cost variance = Standard FOH costs - Actual FOH costs

- Standard FOH costs = FOH rate per unit x Actual output

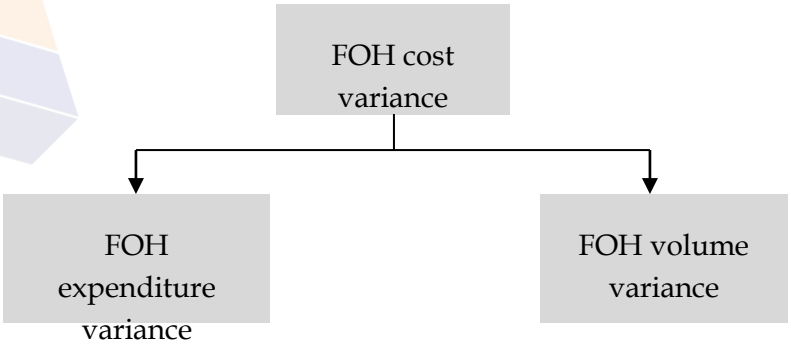
OR

- Standard FOH costs = FOH rate per hour x Std. hours of actual production

Fixed overhead cost variance is the summation of following variances (sub divisions)

(1) Fixed overhead expenditure variance (Price aspect)

(2) Fixed overhead volume variance (Quantity aspect)



FOH volume variance is devided into two sub variances, "FOH volume capacity" and "FOH volume efficiency". However this sub-division is beyond Business level - II syllabus. Therefore you should be able to calculate above three variances only.

(1) Fixed Overhead Expenditure Variance

This is also known as "FOH spending" variance. FOH expenditure variance indicates the difference between budgeted fixed overheads for the actual period and actual fixed overheads incurred. As a formula;

FOH expenditure variance = Budgeted FOH - Actual FOH

(2) Fixed Overhead Volume Variance

A volume variance is calculated only for fixed overheads. FOH volume variance is the difference between the fixed overheads absorbed by the actual production and the budgeted fixed overheads for the period. As a formula;

$$\text{FOH volume variance} = \text{FOH absorption rate per hour} \left(\text{Standard hrs. of actual production} - \text{Budgeted hrs.} \right)$$

- Absorption rate per hour x Std. hrs = Std. FOH
- Absorption rate per hour x Budgeted hrs = Budgeted FOH

Therefore FOH volume variance formula can be used in following form as well.

FOH volume variance = Std. FOH - Budgeted FOH

Example: (1)

XYZ Limited's budgeted production for the current year was 50,000 units. Annual budgeted fixed overhead costs were Rs. 100,000. 50 working weeks per annum and 40 working hours per week.

Actual information for the last week;

Actual production - 900 units

Actual fixed production overheads costs - Rs. 1,900 2

hours were idle due to a machine break down.

You are required to:

(i) Calculate the variances

(ii) Prepare relevant ledger accounts

Answer:

Workings :

- FOH absorption rate per unit = $\frac{Rs.100,000}{50,000}$ = Rs. 2
- FOH absorption rate per hour = $\frac{Rs.100,000}{50 \times 40}$ = Rs. 50
- Standard production per hour = $\frac{50,000}{2,000}$ = 25 Units
- Standard hours for actual production = $\frac{900}{25}$ = 36

- Standard FOH = 2 x 900
  = Rs. 1,800

  50 x 36
  Rs. 1,800

OR

- Standard FOH = Std. FOH - Actual FOH
  = 1,800 - 1,900
  = (100) A

- FOH cost variance = Budgeted FOH - Actual FOH
  =
  = _____ 100,000 1,900

FOH expenditure variance = 50

2,000 - 1,900

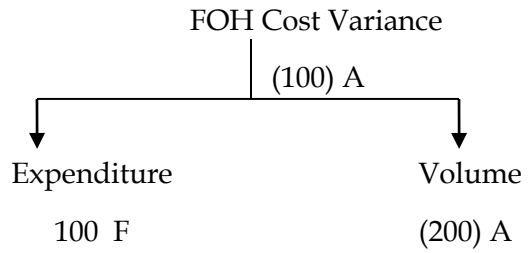
= 100 F

= =

- FOH ab. rate per hour (Std. hr.-Budgeted hrs.)

FOH volume variance = 50 (36 – 40)

= = (200) A



Possible reasons for FOH Cost Variances

As in the case of VOH variances, a great effort to be made to identify the reasons for these variances. Followings are among them.

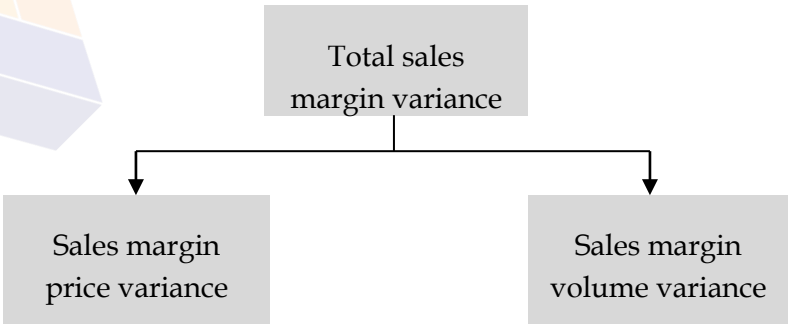
- Property tax rates may change
- Insurance premium may increase or decrease
- Depreciation on acquisitions which are not planned
- Changes in the volume

FOH volume variance A/C Cr.

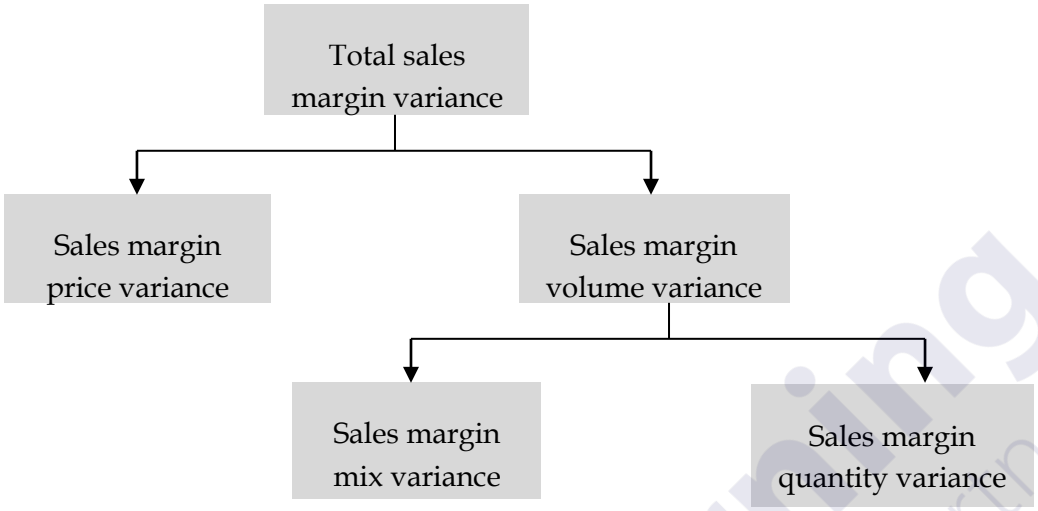
4.2 Sales Margin Variances

Up to now in this chapter we learnt various cost variances. Its main objective is to help management to control costs. In order to achieve planned profits, management also wish to control sales, thereby the profit (or margin) from sales.

If the business manufactures and sells only one product, sales margin variances are as follows.



When it manufactures and sells two or more products, sales margin volume variance is again analysed in to two sub variances; 'Sales margin mix' and 'Sales margin quantity' variance.



Whereas, your CA Business Level - II syllabus requires you to have the knowledge to calculate sales margin variances in a single product situation only. We will demonstrate the calculation of these variances using the following example.

Example:

Budgeted:

Sales and production volume	200 units
Standard / budgeted selling price	Rs. 25
Standard cost per unit	Rs. 22

Actual results:

Sales and production volume	210 units
Actual selling price	Rs. 24
Actual cost per unit	Rs. 23

Steps:

(1) Calculate **actual margin per unit;** (Not the actual profit)

Actual margin per unit = Actual selling price - Standard cost

= 24 - 22

= 2

Here you should note that, not the actual cost per unit but the standard cost per unit is used to calculate actual margin per unit.

(2) Calculate **total actual margin;**

Total actual margin = Actual margin per unit x Actual sales qty.

= 2 x 210

= 420

(3) Calculate **budgeted profit per unit;**

Budgeted profit per unit = Budgeted selling price - Standard cost

= 25 - 22

= 3

(4) Calculate **total budgeted profit;**

Total budgeted profit = Budgeted profit per unit x Budgeted sales qty

= 3 x 200

= 600

(5) Calculate variances using following formulas;

(a) Total sales margin variance = Total actual margin – Total budgeted profit

= 420 - 600

= (180) A

(b) Sales margin price variance = Qty. Sold (Actual price – Budgeted price)

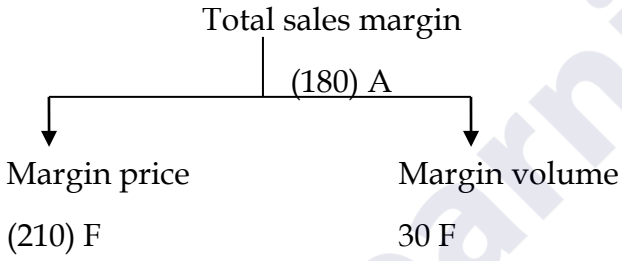
(b) = 210 (24 - 25)

= (210) A

Sales margin volume variance = Budgeted profit per unit (Actual qty. – Budgeted qty.)

= 3 (210 - 200)

= 30 F



Note:

It is to be noted that, sales variances are not accounted for, because the main purpose of standard cost book keeping is to keep a control with regard to the costs in books.

5. Operating Statements

Operating statements are prepared to show how the combination of variances reconciles budgeted profit and actual profit.

So far, we have considered how the individual variances are calculated without considering how they combine to reconcile (the difference between) budgeted profit and actual profit for a period. This reconciliation is usually presented as a report to the senior management at the end of each control period. This report is control called an **"Operating statement"** or **"Statement of variances"**.

An operating statement is 'a regular report for the management which compares actual with budget and highlights variances.'

5.1 Operating Statements under Absorption Costing

Most of standard costing systems are based on total absorption cost principles. Standard and variances described up to now, in this chapter are pertaining to an absorption costing system.

Extensive Example

HEC Comoros Ltd (HEC COM) manufactures a single product, and the entire production is sold as soon as it is finished. There are no opening or closing stocks of raw material and finished goods. Work in progress is also negligible. 'HEC COM' operates a standard costing system and variances are analysed on a monthly basis. The standard cost card for the product, a Fishing hook, is as follows.

Standard cost sheet – Fishing hook

	Rs.
Direct materials (0.5 Kg @ Rs. 4)	2.00
Direct wages (2 hrs @ Rs. 8)	16.00
Variable overheads (2 hrs @ Rs. 0.30)	0.60
Fixed overheads	7.40
Standard cost	26.00
Standard profit	6.00
Standard selling price	32.00

Note:

Selling and administration expenses are not included in the standard cost, and are written off to the P & L as a periodic cost.

Budgeted selling and administration expenses are Rs. 20,400. Budgeted production and sales volume for the month of December' 2019 was 5,100 units. Actual results for December' 2019 were as follows.

Production of 4,850 units was sold for	Rs. 150,350
Materials consumed in production	2,300 Kgs at a total cost of Rs. 9,800
Labour hours paid	8,500 hours at a total cost of Rs. 67,800
Variable overheads amounted to	Rs. 2,600

Fixed overheads amounted to	Rs. 42,300
Selling and administration expenses amounted to	Rs. 18,000

You are required to:

(1) Calculate all variances

(2) Prepare an operating statement for the month of December' 2019, under an absorption costing system.

Answer:

(1) Variances

(a) D/mat. price variance = Qty. purchased (S/price – A/price)

= 2,300 (4 – 9,800/2,300)

= (600) A

(b) D/mat. usage variance = S/price (Std. usage – Act. Usage)

= 4 (4,850 x 0.5 – 2,300)

= 500 F

(c) D/lab. rate variance = Hrs. paid (Std. rate – Act. rate)

= 8,500 (8 – 67,800/8,500)

= 200 F

(d) D/lab. efficiency variance = Std. rate (Std. hrs. – worked hrs.)

= 8 (4,850 x 2 - 8,500)

= 9,600 F

(e) VOH expenditure variance = Allowed VOH – Act. VOH

= 0.30 x 8,500 – 2,600

= (50) A

(f) VOH efficiency variance = Ab. rate per hour(Std. hrs.–Worked hrs.)

= 0.30 (4,850 x 2 – 8,500)

= 360 F

(g) FOH expenditure variance = Budgeted FOH – Act. FOH

= 5,100 x 7.40 – 42,300

= (4,560) A

(h) FOH volume varianc = FOH rate per hour(Std. hrs. –Budgeted hrs.)

OR

FOH volume variance = Std. FOH – Budgeted FOH

= 7.40 x 4,850 – 5,100 x 7.40

= (1,850) A

(i) Sales margin price variance= Qty. sold (Act. Price – Budgeted price)

= 4,850 (31 – 32)

= (4,850) A

(j) Sales margin volume variance =Std. profit per unit(Act. Qty. – Bud. Qty.)

= 6 (4,850 – 5,100)

= (1,500) A

(k) Total selling & admin. Exp. = Budgeted – Actual

Variance = 20,400 – 18,000

= 2,400 F

Since, selling and administration expenses are not absorbed, only the expenditure variance is calculated.

(2) HEC Comoros Ltd Operating Statement – December' 2019

(Absorption method)			**Rs.**
Budgeted profit before sell. & adm. Cost (6 x 5,100)			30,600
Less: Budgeted selling & Admin. Exp.			(20,400)
Budgeted profit for the month			10,200
Variances:	**F**	**A**	
	Rs.	**Rs.**	
D/M Price	-	600	
D/M Usage	500	-	
D/L Rate	200	-	
D/L Efficiency	9,600	-	
VOH Expenditure	-	50	
VOH Efficiency	360	-	
FOH Expenditure	-	4,560	
FOH Volume	-	1,850	
Sales – Margin price	-	4,850	
Sales – Margin volume	-	1,500	
Selling & admin. – Expenditure	2,400	-	
	13,060	13,410	(350)
Actual profit for the month			9,850

To check the accuracy :		**Rs.**	**Rs.**
Actual sales			150,350
(-) Actual costs :			
Material 9,800 Labour	67,800		
VOH		2,600	
FOH		42,300	
Sell. and Admn. OH		18,000	(140,500)
Actual profit	9,850		

5.2 Operating Statements under Marginal Costing

Marginal costing system was discussed in detailed in tute 7. (you are required to refresh yourself by reading it, before you enter in to this.)

Standard costing system can also be incorporated in to marginal cost principles as well. Then the system is termed "Standard Marginal Costing" or "Standard Variable Costing".

The marginal costing system separates costs into "Variable" and "Fixed" only. Fixed costs are not absorbed in to the individual units and instead they are deducted in total from the contribution.

A standard marginal costing system has the following features;

(1) Standards are developed in normal manner as in absorption method.

(2) Fixed costs do not appear in standard cost card.

(3) The standard contribution is calculated instead of standard profit.

(4) The budgeted profit statement is prepared in the following format.

	Budgeted sales	XX
(-)	Budgeted variable cost of sales	(XX)
	Total budgeted contribution	XX
(-)	Budgeted fixed costs	(XX)
	∴ Budgeted profit	XX

(5) **Variances :**

All other variances are similar to those in Absorption Method, except for fixed overhead cost variances and sales margin variances. i.e;

- Direct material
- Direct labour variances

} Variances are similar to standard absorption costing

- Variable overheads
- Fixed overhead

Only the expenditure variance is calculated

 Sales variances:

- Total sales contribution variance replaced total sales margin variance.
- Price variance is the same as absorption method.
- Sales contribution volume variance replaced sales margin volume variance.

Example

If returning back to the example of HEC Comoros Ltd, the revised variances in a system of standard marginal costing would be as follows.

 FOH expenditure variance = Budgeted FOH – Actual FOH

= 5,100 x 7.40 – 42,300

= (4,560) A

 Sales contribution volume variance= Std. contribution qty. (Act. Sales qty. – Bud. sales)

= 13.40 (4,850 – 5,100)

= (3,350) A

Workings :

	Rs.
Std. selling price	32
(-) Std. variable cost (2 + 16 + 0.60)	18.60
Std./Budgeted contribution per unit	13.40

Total budgeted contribution (13.40 x 5,100) Rs. 68,340

HEC Comoros Ltd Operating Statement – December' 2019

(Marginal Method) **Rs.**

Total Budgeted Contribution			68,340
(+ / -) Variances:	**F**	**A**	
	Rs.	**Rs.**	
D/M Price	-	600	
D/M Usage	500	-	
D/L Rate	200	-	
D/L Efficiency	9,600	-	
VOH Expenditure	-	50	
VOH Efficiency	360	-	
Sales – Margin price	-	4,850	
Sales – Contribution volume	-	3,350	
	10,660	8,850	1,810
Actual contribution			70,150
Budgeted FOH		37,740	
(+) FOH Exp. Variance		4,560	
□ Actual FOH		42,300	(42,300)
Budgeted sell & admin. O/H		20,400	
(-) Sell & admin. O/H Exp. Variance		(2,400)	(18,000)
□ Actual profit			9,850

Important Notice

You should notice that the actual profits calculated under both methods are the same because there were no stocks (or changes in stock). If this is not the case, these two methods produce different profits.