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COSTING

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CHAPTER 11 JPBP



Theory Chart

Chp11 Joint Product By Product

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TERMS

Joint Products

- **Joint Products** - In other words, **two or more products** of **equal** importance, produced, **simultaneously** from the same process, with each having a **significant** relative **sale value** are known as joint products.
- For example, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

By-Products

- By-products **emerge** as a **result** of processing operation of **another product (main)** or they are produced from the scrap or waste of materials of a process.
- In short a by-product is a **secondary or subsidiary** product which emanates (originate) as a result of manufacture of the main product.
- Examples: molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonisation of coal and glycerin obtained in the manufacture of soap.

Difference between Joint Product and By Product

The main points of distinction as apparent from the definitions of Joint Products and By-Products are:

- **Joint** products are of **equal importance** whereas **by-products** are of **small economic value**.
- Joint products are produced **simultaneously** but the by-products are produced **incidentally** in addition to the main products.

Co-Products

- Joint products and co-products are used synonymously in common parlance, but strictly speaking a **distinction** can be made between two.
- Co-products may be defined as two or more products which are **contemporary** but do **not emerge** necessarily from the **same material** in the same process.
- For instance, wheat and gram produced in two separate farms with separate processing of cultivation are the co-products. Similarly, timber boards made from different trees are co-products.

Split off Point/ Point of Separation

- Point of **Separation** of two or more products (joint/by) from the **common process** in the production line.
- Costs incurred till this point are taken as Joint Costs.

Joint Cost

- Joint costs are the **expenditures** incurred **up to the point of separation** i.e. split-off point.
- The main problem faced in the case of joint products/ byproducts is the apportionment of this joint costs to joint products/ or by products.
- For costs incurred after the split off point there is no problem, as these costs can be directly allocated to individual joint products or by-products.

COSTING REQUIREMENTS OF JBPB

Industries

Agricultural product industries, chemical process industries, sugar industries, and extractive industries are some of the industries where two or more products of equal or unequal importance are produced either simultaneously or in the course of processing operation of a main product.

Problems faced by Industries

- In all such industries, the management is faced with the **problems** such as, **valuation** of inventory, **pricing** of product and **income determination**, problem of taking decision in **matters of further processing** of by-products and/or joint products after a certain stage etc. In fact, the various problems relate to
 - **apportionment of common costs** incurred for various products and
 - aspects other than mere apportionment of costs incurred upto the point of separation

METHODS OF APPORTIONMENT OF JOINT COST

Need of Apportionment

- As the relations between materials, processes and joint products are complex and unobservable, there is **no way to determine the cost of the different production factors** used in the processes for the production of each of the joint products
- Therefore, the costs incurred in the manufacture of each of the joint products cannot be correctly identified.
- It can only be **apportioned** to the joint products by using some **rational methods**

Physical Unit Method/ Avg. Cost Method

- This **method** is based on the **assumption** that the **joint products** are capable of being **measured** in the **same units**. Accordingly, joint costs here are apportioned on the basis of some **physical base**, such as weight, numbers etc.
- Any loss arises during the joint production process is also apportioned over the products on the same basis.
- This method **cannot be applied** if the physical **units** of the two joint products are **different**.
- The main **defect** of this method is that it **gives equal importance** and value to all the joint products.

Market value after further processing

- Here the basis of apportionment of joint cost is the total **sales value of finished** products.
- The **use** of this method is **unfair** where **further processing** costs after the point of separation are **disproportionate** or when all the joint products are not subjected to further processing.
- The Market Value at point of separation or net realisable value method overcomes the shortcoming of this method.

Market Value at Point of Separation

- It is a **useful method** where further processing costs are incurred **disproportionately**.
- It is **difficult to apply** this method if the **market value** of the products at the point of separation is **not available**.

Net Realisable Value at Split-off Point Method

- In this method of joint cost apportionment the **followings are deducted** from the **sales value** of joint products at final stage i.e. after processing:
 - Estimated **profit** margins,
 - Selling and distribution** expenses, if any, and
 - Post split- off costs/ **Further Processing Costs**
- The net realisable value at split-off point method is **widely used** in the industries.
- It is most **preferred** because it removes the defect of above studied methods.

Contribution Margin Method

- According to this method, **joint costs** are segregated into **two parts** – variable and fixed.
- The **variable costs** are apportioned over the joint products on the basis of **units produced** (average method) or physical quantities.
- In case the products are **further processed** after the point of separation, then all **variable cost incurred** be **added** to the variable costs determined earlier.
- In this way total variable cost is arrived which is deducted from their respective sales values to **ascertain** their **contribution**.
- The **fixed costs** are then apportioned over the joint products on the basis of the **contribution ratios**.

Summary of different methods

Method Name	Circumstances when it should be used
Physical Unit / Avg. Cost Method	when units produced have same unit, when sale price of all the products is uniform.
NRV at Split-off Point Method	When the realisable value of joint products at split-off is not known.
Technical Estimates	When the result obtained by Net Realisable Value (NRV) at Split-off Point Method does not match with the resources consumed by joint products
Market value at the point of separation	Where further processing costs are incurred disproportionately.
Market value after further processing	Where further processing costs after the point of separation are proportionate and all the joint products are subject to further processing.

METHODS OF APPORTIONMENT OF JOINT COST TO BY PRODUCTS

Net Realisable Value method

- The **realisation** on the disposal of the **byproduct** may be **deducted from the total cost** of production so as to arrive at the cost of the main product.
- When the **by-product** requires some **additional processing** and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be **deducted** from the total value realised from the sale of the by-product and only the **net realisations** should be **deducted from the total cost** of production to arrive at the cost of production of the main product.
- Separate **accounts** should be maintained for collecting **additional expenses** incurred on:
 - further processing of the by-product, and
 - selling, distribution and administration expenses attributable to the byproduct.

Standard Cost in Technical Estimates

- By-products may be **valued at standard costs**. The standard may be determined by **averaging costs** recorded in the **past** and making **technical estimates** of the number of units of original raw material going into the main product and the number forming the by-product or by adopting some other consistent basis.
- This method may be **adopted** where the by-product is **not saleable** in the condition in which it emerges or **comparative** prices of similar products are **not available**.

Comparative price

- Under this method, the value of the by-product is ascertained with reference to the **price of a similar** or an alternative **material**.
- Suppose in a large automobile plant, a blast furnace not only produces the steel required for the car bodies but also produces gas which is utilised in the factory. This gas can be valued at the price which would have been paid to a gas company if the factory were to buy it from outside sources.

Re-use basis

- In some cases, the by-product may be of such a **nature** that it can be **reprocessed** in the **same process** as part of the input of the process.
- In that case the value put on the by-product should be **same as that of the materials** introduced into the process.
- If, however, the by-product can be put into an earlier process only, the value should be the same as for the materials introduced into the process.

TREATMENT OF BY PRODUCTS COST IN COST ACCOUNTING

- When they are of small total value:** When the by-products are of small total value, the amount realized from their sale may be dealt in any one of the following **two ways**:
 - The sales value of the by-products may be **credited** to the **Costing Profit and Loss Account** and no credit be given in the Cost Accounts. The credit to the Costing Profit and Loss Account here is treated either as **miscellaneous income** or as additional sales revenue.
 - The sale proceeds of the by-product may be treated as **deductions from the total costs**. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.
- When they are of considerable total value:** if by-products are of considerable total value, they may be **regarded as joint products** rather than as by-products.
- Special Point:** if by product **requires further processing**, the net realizable value of the by-product at the split-off point may be arrived at by **subtracting** the **further processing cost** from the realizable value of by-products.