COST ACCOUNTING

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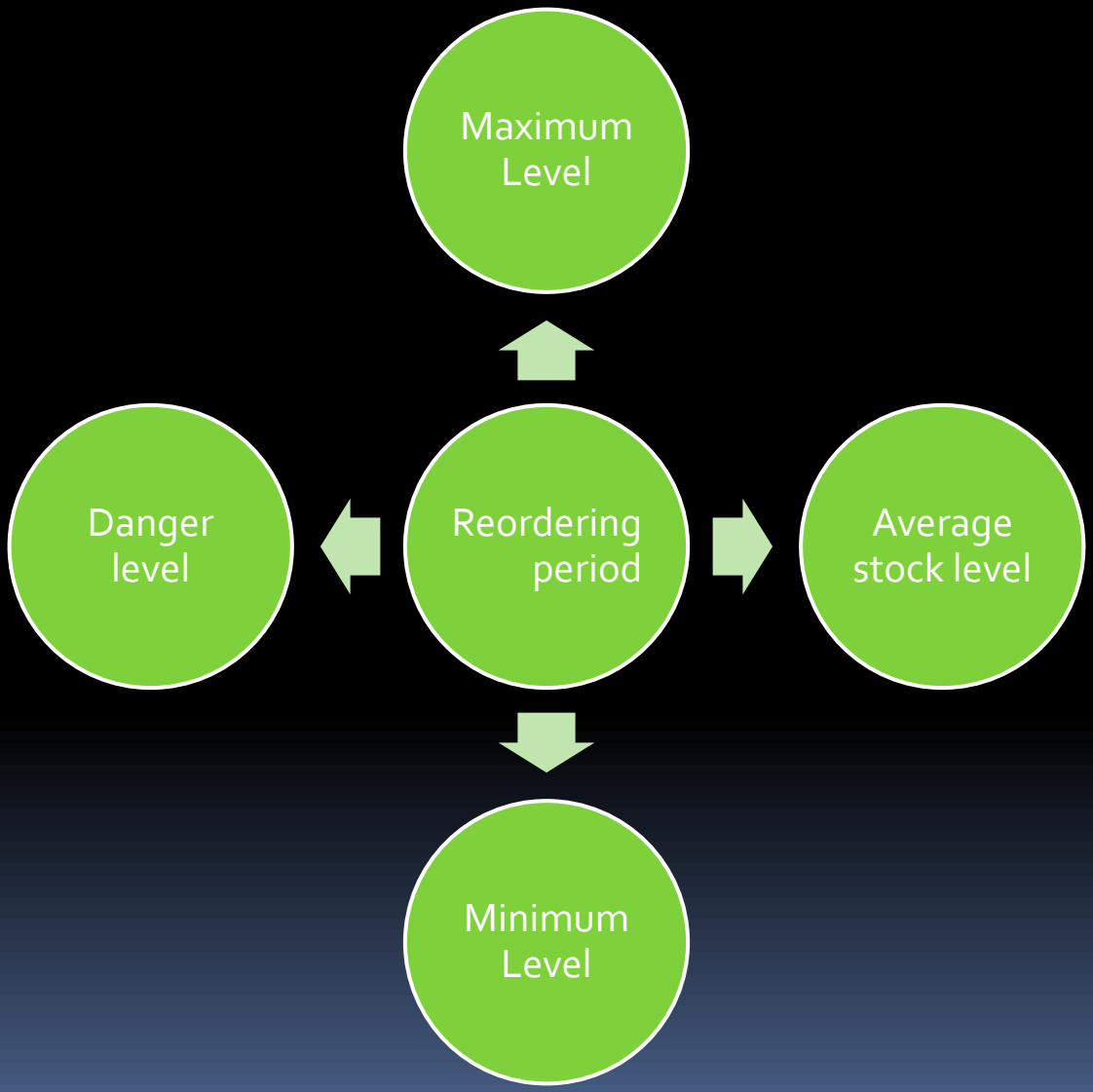
Material Cost Control

- Material control aims at eliminating and minimizing all kinds of wastes and losses while the materials are being purchased, stored, handled, issued or consumed. A number of techniques are used at planning, procuring and holding stage of material which help in exercising and effecting material cost control.
  Some of the most important techniques of material cost control are as follows:

IMPORTANT TECHNIQUES OF MATERIAL CONTROL

- Determination of stock levels
- EOQ
- ABC Analysis
- VED Analysis
- Material/Inventory Turnover Ratio
- Perpetual Inventory System

Determination of stock levels



Reordering Level

- It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that material. This level is fixed somewhere between the maximum and minimum levels in such a way that the difference of quantity of the material between the re-ordering level and the minimum level will be sufficient to meet the requirements of production up to the time the fresh supply of the material is received.
- Re-ordering level can be calculated by applying the following formula.
- Ordering Level = Minimum Level + Consumption during the time required to get the fresh delivery.
- **Another formula given by Wheldon in his book 'Cost Accounting' is as follows:**
- Re-ordering Level = Maximum Consumption x Maximum Re-order Period. Here, maximum re-order period means the maximum period taken to get the material once it is initiated. Wheldon has taken the maximum period and maximum consumption during that period so that factory may not stop in any case due to shortage of materials.

Minimum Level

- This represents the minimum quantity of the material which must be maintained in hand at all times. The quantity is fixed so that production may not be held up due to shortage of the material.
- **In fixing this level, the following factors are taken into consideration:**
- 1. Lead time i.e. time lag between indenting and receiving of the material. It is the time required to replenish the supply.
- 2. Rate of consumption of the material during the lead time.
- 3. Nature of the material. Minimum level is not required in case of a special material which is required against customer's specific order.
- **Formula for the calculation of minimum level given by Wheldon is as follows:**
- Minimum Stock Level = Re-ordering Level – (Normal Consumption x Normal Re-order Period),

Maximum Level

- It represents the maximum quantity of an item of material which can be held in stock at any time. Stock should not exceed this quantity. The quantity is fixed so that there may be no overstocking.
- **Overstocking should be avoided as far as possible because of the following disadvantages:**
- 1. Overstocking unnecessarily blocks working capital which could be profitably utilized somewhere else.
- 2. Overstocking will need more godown space, so more rent will have to be paid.
- 3. There may be loss due to obsolescence on account of overstocking.
- 4. There are chances of reduction in quality because large stocks will require more time before they are consumed.
- 5. There may be fear of reduction in market values of the overstocked materials.
- **Maximum stock level is fixed by taking into account the following factors:**
- 1. Amount of capital available for maintaining stores.
- 2. Godown space available.
- 3. Maximum requirement of the stores for production purposes at any point of time.
- 4. Rate of consumption of the material during the lead time.
- 5. The time lag between indenting and receiving of the material.
- 6. Possibility of loss in stores by deterioration, evaporation etc. There are certain stores which deteriorate in quantity if they are stored over a long period.
- 7. Cost of maintaining stores.
- 8. Likely fluctuation in prices. For instance, if there is the possibility of a substantial increase in prices in the coming period, a comparatively large maximum stock level will be fixed. On the other hand, if there is the possibility of decrease in prices in the near future, stocks are kept at a very reduced level
- 9. The seasonal nature of supply of material. Certain materials are available only during specific periods of the year, so these have to be stocked heavily during these periods.
- 10. Restrictions imposed by the Government or local authority in regard to material in which there are inherent risks e.g. fire and explosion.
- 11. Possibility of change in fashion and habit which will necessitate change in requirements of materials.
- **The formula for the calculation of maximum stock level given by Wheldon is as follows:**
- Maximum Stock Level = Reordering Level + Re-ordering Quantity – (Minimum Consumption x Minimum Re-ordering Period

Danger Level

- This means a level at which normal issues of the material are stopped and issues are made only under specific instructions. The purchase officer will make special arrangements to get the materials which reach at their danger levels so that the production may not stop due to shortage of materials.
- Danger Level = Average consumption x Max. re-order period for emergency purchases

Average Stock Level

- **This level is calculated by the following formula:**
- Average Stock Level = Minimum Stock Level + 1/2 of Re-order Quantity or 1/2 (Minimum Stock Level + Maximum Stock Level)

Economic Ordering Quantity

- **The total costs of a material usually consist of:**
- Total acquisition cost + Total ordering cost + Total carrying cost.
- **Total Acquisition Cost:**
- Total Acquisition cost through buying is usually unaffected irrespective of the quantity of material ordered at one time unless quantity discounts are available.
- Thus, when acquisition costs of a material remain the same, they are irrelevant and are often excluded while deciding the quantity of a material to be ordered at one time. The only costs to be taken care of are ordering costs and carrying costs.
- The quantity of material to be ordered at one time is known as economic ordering quantity. This quantity is fixed in such a manner as to minimise the cost of carrying and ordering the stock.

Carrying Cost

- **It is the cost of holding the materials in the store and includes:**
- 1. Cost of storage space which could have been utilized for some other purpose.
- 2. Cost of bins and racks that have to be provided for the storage of materials.
- 3. Cost of maintaining the materials to avoid deterioration.
- 4. Amount of interest payable on the money locked up in the materials.
- 5. Cost of spoilage in stores and handling.
- 6. Transportation costs in relation to stock.
- 7. Cost of obsolescence on account of some of the materials becoming obsolete after some time of storage either due to change in the process or product.
- 8. Insurance cost.
- 9. Clerical cost etc.
- All these costs taken together, in India, amount to somewhere near about 20-25 per cent of the cost of materials per year. So efforts should be made to reduce such alarming rate of carrying cost.

Ordering Cost:

- **Ordering Cost:**
- **It is the cost of placing orders for the purchase of materials and includes:**
- 1. Cost of staff posted in the purchasing department, inspection section and payment department.
- 2. Cost of stationery, postage and telephone charges.
- Thus, this type of cost includes cost of floating tenders, cost of comparative evaluation of quotations, cost of paper work, and postage involved in placing the order, cost of inspection and cost of accounting and making payments. In other words, the cost varies with the number of orders.
- The quantity to be ordered should be such which minimises the carrying and ordering costs. The order for the material to be purchased should be large enough to earn more trade discount and to take advantage of bulk transport, but at the same time it should not be too large to incur too heavy a payment on account of interest, storage and insurance costs.
- **If the price to be paid is stable, the quantity to be ordered each time can be ascertained by the following formula:**
- where
- Q = Quantity to be ordered.
- C = Consumption of the material concerned in units during a year.
- O = Cost of placing one order including the cost of receiving the goods i.e. costs of getting an item into the firm's inventory.
- I = Interest payment including variable cost of storing per unit per year i.e. holding costs of inventory.

ABC ANALYSIS

The concept of ABC Analysis was coined by Pareto an Indian philosopher in the 19th century. It is a value based system of material control. In this technique materials are analysed according to their value so that costly and valuable materials are given greater attention and care.

All items of materials are classified according to their value- high, medium and low values, which are known as A,B and C items respectively. ABC technique is some time called as 'Always better control method'.

`A' Items:

These are high value items which may consist of only a small percentage of the total items handled. On account of their high cost, these materials should be under the tightest control .

`B' Items:

These are medium value materials which should be under the normal control procedures.

`C' Items:

These are low value materials which represent a very large number of items. These materials should be under the simple and economic method of control.

VED Analysis

- VED—vital, essential and desirable—analysis is used primarily for control of spare parts. The spare parts can be divided into three categories—vital, essential or desirable—keeping in view the criticality to production. The spares, the stock-out of which even for a short time will stop production for quite some time and where the cost of stock-out is very high, are known as vital spares.
- The spares, the absence of which cannot be tolerated for more than a few hours or a day and the cost of lost production is high and which are essential for the production to continue, are known as essential spares. The desirable spares are those spares which are needed but their absence for even a week or so will not lead to stoppage of production. Some spares, though negligible in monetary value, may be vital for the production to continue and require constant attention.
- Such spares may not receive the attention they deserve if they are maintained according to ABC analysis because their value of consumption is small. So, in their cases, VED analysis is made to get the effective results. As VED analysis analyses items based on their criticality to production, it can also be used for those items of materials which are difficult to procure.

Perpetual Inventory System:

- The Chartered Institute of Management Accountants, London, defines the perpetual inventory as "a system of records maintained by the controlling department, which reflects the physical movements of stocks and their current balance". Bin cards and the stores ledger help the management in maintaining this system as they make a record of the physical movements of the stock on the receipts and issues of the materials and also reflect the balance in the stores.
- Thus, it is a system of ascertaining balance after every receipt and issue of materials through stock records to facilitate regular checking and to avoid closing down the firm for stocktaking.
- To ensure the accuracy of perpetual inventory records (i.e. bin card and stores ledger), physical verification of the stores is made by a programme of continuous stocktaking. It is possible that the balance of stock shown by bin cards or stores ledger may differ from the actual balance of stock as ascertained by physical verification. It may be due to the following avoidable and unavoidable causes.

- **Avoidable Causes:**
- 1. Clerical mistakes, i.e. wrong posting, non-posting of entries, wrong casting etc. Such errors can be corrected and actual balance can agree with book balance by making the required correction in bin cards or stores ledger.
- 2. Pilferage and thefts.
- 3. Carelessness in material handling.
- 4. Short or over-issue of materials.
- **Unavoidable Causes:**
- 1. Actual balance may be less due to shrinkage and evaporation.
- 2. Actual balance may be more due to absorption of moisture.
- 3. Actual balance may be less due to breakdown of fire, riots etc.
- 4. Material may be lost due to breaking up bulk material into smaller parts for issue. For example, some iron is lost due to breaking up big iron rods into smaller parts.

Material (or Inventory) Turnover Ratio:

- Average stock is the average of the opening stock and closing stock.
- **The stock turnover ratio can also be determined in days as follows:**
- Inventory Turnover in Days = Days during the period/Inventory Turnover Ratio
- It is essential to compare the turnover of different kinds of material to find out the items which are slow moving thus helping management to avoid keeping capital locked up in such items. A low ratio is an indicator of slow moving stock, accumulation of obsolete stock and carrying of too much stock. On the other hand, a high turnover ratio is an indication of fast moving stock and less investment in stock.
- A low turnover ratio will lead to the disadvantages arising out of over-stocking. If the stock turnover ratio for a particular item is zero, it means that the item had not been used at all during the period and should be immediately disposed of otherwise the quality of the item will be deteriorated.
- An exception to this is spare parts for machinery in use which can be required at any time when the machinery goes out of order. Thus, spare parts should be kept in stock for the period machinery is in use.
- In this connection, it will be worthwhile to have a discussion on slow moving, dormant and obsolete stocks of stores items.
- Slow Moving Stocks. Slow moving stocks are those items of stores which are not issued at frequent intervals. The issues of such items are irregular and are not made at normal intervals.

- **Dormant Stocks:**
- Dormant stocks are those items of stores which are rarely issued from the store. Consumption of such items is almost nil. These items are stored in case of need, such as spare parts may be needed when the machinery goes out of order.
- **Obsolete Stocks:**
- Obsolete stocks are those items of stores which have become out molded and have no further use for the purpose they were purchased. Stocks may become obsolete because of changes in product design or methods of production, use of substitute materials, discontinuation of a product etc.
- Slow moving and obsolete items stock can be detected by scanning the stores records (ledger) and by inventory turnover ratio.

Just-in-Time Inventory System

- Keeping in view the enormous carrying cost of inventory in the stores and god-owns, manufacturers and merchandisers are asking for more frequent deliveries with shorter purchase- order lead times from their suppliers. Now-a-days organizations are becoming more and more interested in getting potential gains from making smaller and more frequent purchase orders.
- In other words, they are becoming interested in just-in-time purchasing system. Just-in-time (JIT) purchasing is the purchase of material or goods in such a way that delivery of purchased items is assured before their use or demand.
- Just-in-time purchasing recognizes too much carrying costs associated with holding high inventory levels. Therefore, it advocates developing good relations with suppliers and making timely purchases from proven suppliers who can make ready delivery of goods available as and when need arises.
- EOQ (i.e., Economic Order Quantity) model assumes a constant order quantity whereas JIT purchasing policy advocates a different quantity for each order if demand fluctuates. Economic order quantity lays emphasis on ordering and carrying costs but inventory management extends beyond carrying and ordering costs to include purchase costs, quality costs and stock-out cost. Just-in-time purchasing takes into consideration all these costs and moves outside the assumptions of the EOQ model.

Thank You