

Chapter 07

- Spare Parts Inventory Management



Spare Part

- Spare part means a part or sub-unit or a major assembly which is available in stock for substitution when needed.

Need for Scientific Management of Spare Parts

Factors which necessitate scientific spare parts management are:

- Random and unpredictable pattern of failure of machines and equipments
- Long lead time required for procurement of spare parts from original equipment manufacturers
- Difficulty in manufacturing of spare parts because of non-availability of special materials
- High tendency for obsolescence of machines and equipments

Classification of Spare Parts

- Regularly used spare parts
- Irregularly used spare parts

Classification of spare parts based on movement analysis

- Fast moving
- Slow moving
- Non-moving

Classification of spare parts based on functional characteristics

- Insurance spares or capital spares
- Rotable spares or Repairable spares
- Overhauling spares
- Maintenance spares

Salient Features of Spare Parts

- About 10 % of value of a machine is invested in spare parts at any point of time
- About 40 percent of the total working capital is tied up in spare parts inventory
- About one third of spare parts inventory is non-moving or obsolete
- The lead time is long and prices exorbitant
- The inventory carrying charges are about 30 percent of the value of inventory

Additional Factors influencing Spare Parts

- The Costs involved in spare parts management
- The Quantity of spare parts to be procured

Major Factors involved in the Spare Parts Inventory Problems

- Location of the Plant
- Import Policy
- The Nature of the Plant and Machinery
- Availability and Lead Time for Procurement
- Age of Machines
- Reliability of the Parts

Factors that influence spare parts planning

- Location of the plant
- Government regulations on imports
- Sophistication of industry and the degree of automation
- Lead time for procurement of spare parts
- Service level desired
- Relevant costs such as ordering cost, inventory carrying cost, stock out cost

Factors to be considered with respect to Spare Parts Inventory Policies

- Form of spare parts
- Source of supply of spare parts
- Whether to stock or not to stock certain spare parts
- Standardization
- Ordering method

Overhauling Spares

- Overhauling Spares are those which are used when a machine or equipment is completely stopped from working, periodically and the same is reconditioned by replacing worn-out or defective parts to give a new lease of life to the machine or equipment

Considerations in Overhauling

- Replace some spare parts even if they are serviceable or can be repaired
- Replace items such as 'O' rings, oil seals, fan belts, entirely even if some of them appear to be in good condition
- Replace the repair kit wherever provided earlier

Obsolete Spares

- Obsolete spares are those which are in good working condition but which are no longer useful for the company's operations because of replacement of machines and equipments by machines and equipments of different designs or technology or modification in the design of equipments or machines manufactured by the supplier and also because of changes in the manufacturing processes or materials used or changes in the products manufactured.

Reasons for obsolescence of Spare Parts

- Insufficient attention to initial provisioning of spares
- Inflated list of recommended spare parts given by original equipment manufacturers
- Ordering parts even though the equipment or machine is being phased out due to service life or change in technology
- Wrong indenting or error in forecasting the demanded for spare parts
- Wrong codification leading to duplication

Ordering Method

- Stock Control Ordering Method
- Scheduled Ordering Method
- Base Stock Control Method
- Order or Demand Method

Stocking Policy for Insurance Spares

- Probability of being used is low and expensive
- When not available the machine downtime will be high
- The firm has to take decision to stock either one number of the insurance spare or not to stock the spare part

Stocking Policy for Capital Spares

- The stock level may range between one to three during the life time of the equipment or machine
- Decision depends on
 1. Overstocking cost
 2. Cost of under stocking or stock out

Stocking Policy for Rotable Spares

- Spare part that has failed can be repaired and replaced
- Reserve of rotatable spares has to be maintained in the maintenance stores
- In case of failure of a rotatable spare part it is replaced from the reserve and the failed item is repaired and stored back in the stores

Stocking Policy for Maintenance Spare Parts

- Selective inventory control techniques such as VED, FSN, SDE and the concept of EOQ can be used to stock these spares
- Hold set of spares for every machine
- Keep several sets of spares at the central stores