

Recoupment of Stock Items

Purchasable and Shop

Manufactured

Objective:

- To familiarise with the concept of replenishment of stock in the depot and the various systems of recoupment that are prescribed in the Indian Railways.
- डिपो में स्टॉक की पुनःपूर्ति की अवधारणा और भारतीय रेलवे में निर्धारित विभिन्न खरीद प्रणालियों से परिचित कराना।

Introduction:

- For the purpose of replenishment and for ensuring continued availability of items the following methods of recoupment are followed on Indian Railways.
- **Method of Recoupment:**
- The 3 basic methods are adopted;
 1. Maximum – Minimum System,
 2. Annual Estimate Sheet,
 3. Fixed Level System.

Estimate is on the basis of

- Previous consumption
- Trend of consumption
- Information given by user departments

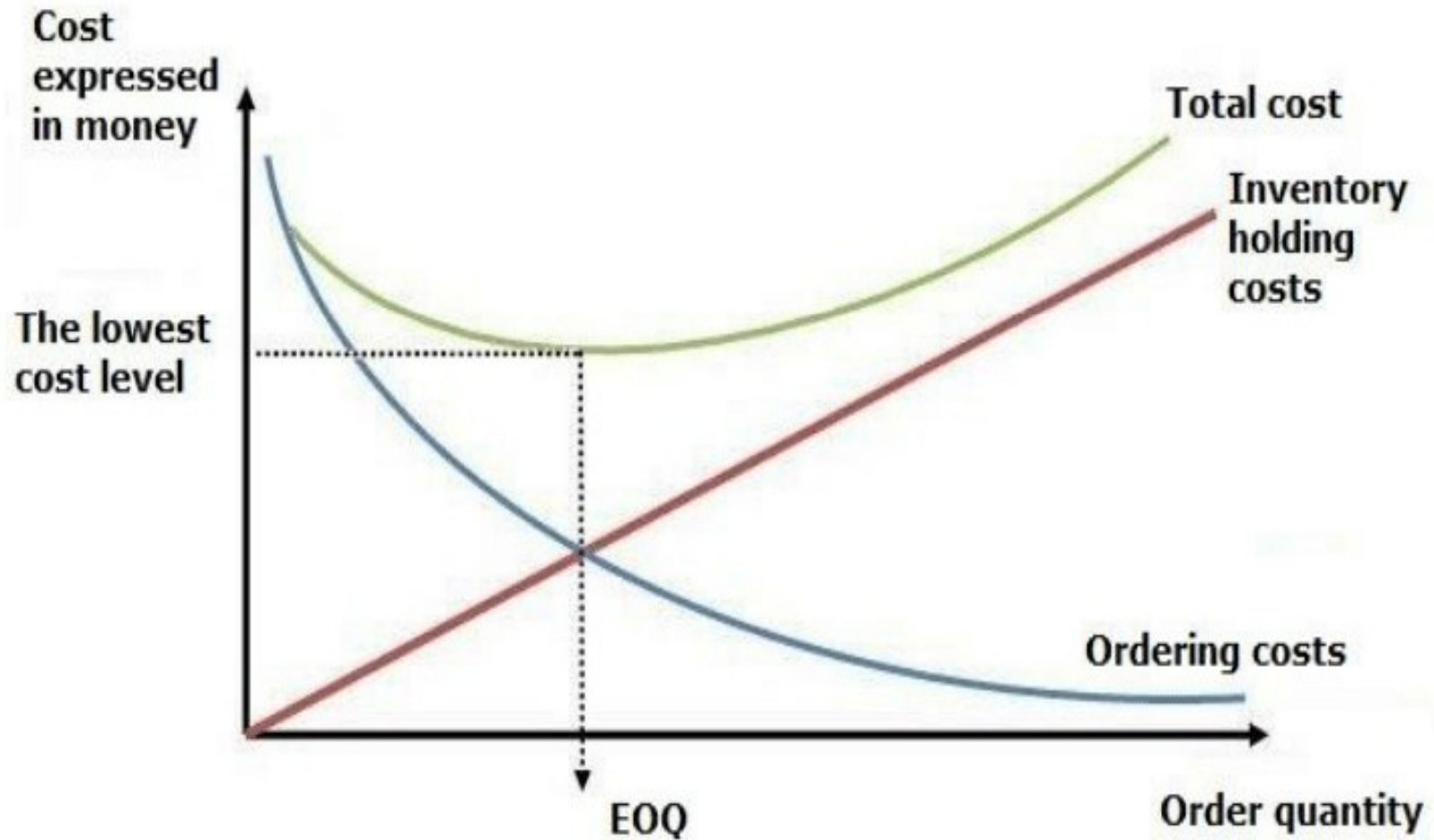
Anticipated Annual Consumption:

- The forecast of anticipated annual consumption is normally estimated based on the past consumption. Generally coverage of last three year's consumption is taken to be forecast for the contract period unless there is a definite trend for increase or decrease. The forecast of requirements of the mechanical workshop is vetted by the Production Engineer of the Shop. In the case of new items, the requirements are intimated by the consuming department who propose the stocking of the item. Due to change in procedures for repairs etc. the consumption of the item is likely to vary and advance intimation to the Depot officer.

Maximum – Minimum Systems:

- It is also known as Fixed order quantity System or Two Bin Systems.
- **Maximum:** it is the quantity which when ordered at a time in the least total annual cost to the organisation.
- If we order large quantities at a time, large amount of capital will be blocked and simultaneously inventory carrying cost will go up, though ordering cost would be low.
- If we order small quantities at a time, the frequency of ordering will go up thereby increasing the ordering cost, though inventory carrying cost will come down.

Economic Order Quantity:



Economic Order Quantity:

- When the balance between ordering cost and inventory carrying cost is struck, the quantity arrived at is called Economic Order Quantity (EOQ) i.e. the maximum quantity should be ordered at a time.
- $EOQ = \sqrt{2 \cdot D \cdot C_o} / C_i \cdot i$
- D= estimated value of annual consumption.
- C_o = ordering cost
- C_i = Price of the item
- i= inventory carrying cost per item per annum.

Economic Order Quantity:

- Due to complex mathematical calculation in EOQ and depending on ordering cost and inventory carrying cost which precise data is not available. The Railway have fixed the following value for the maximum:
- Items of high annual consumption : 3 months requirement (A category items).
- Items of medium annual consumption : 6 months requirement (B category items).
- Items of low annual consumption : 12 months requirement (C category items).

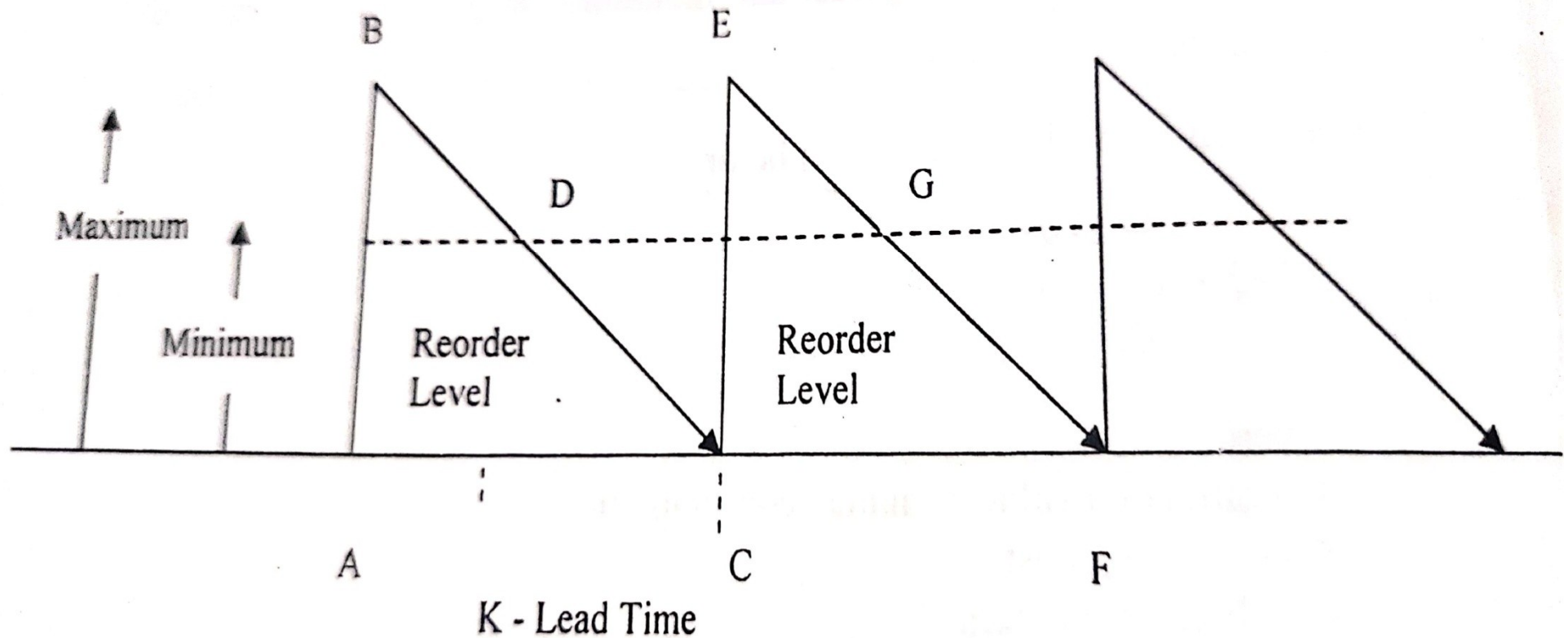
Minimum:

- Every item needs certain time for its procurement (lead time).
- It will be appreciated that at the time of recoupment, some stock are available. These should be sufficient to meet the requirement in the intervening periods till fresh stock are received. This quantity is called “Minimum”.
- This is also known as ‘re-order level’ or re-order point.
- In other words, re order level or minimum is fixed taking into consideration the lead time consumption and additional safety stock or buffer stock that we may decide to keep.

Maximum-Minimum System

- In Maximum-Minimum system perpetual records have to be kept. As soon as the stock + dues level touch minimum, a recoupment is initiated for the quantity equivalent of one maximum.
- In Railway all shop manufactured and some general items are recouped in this system.

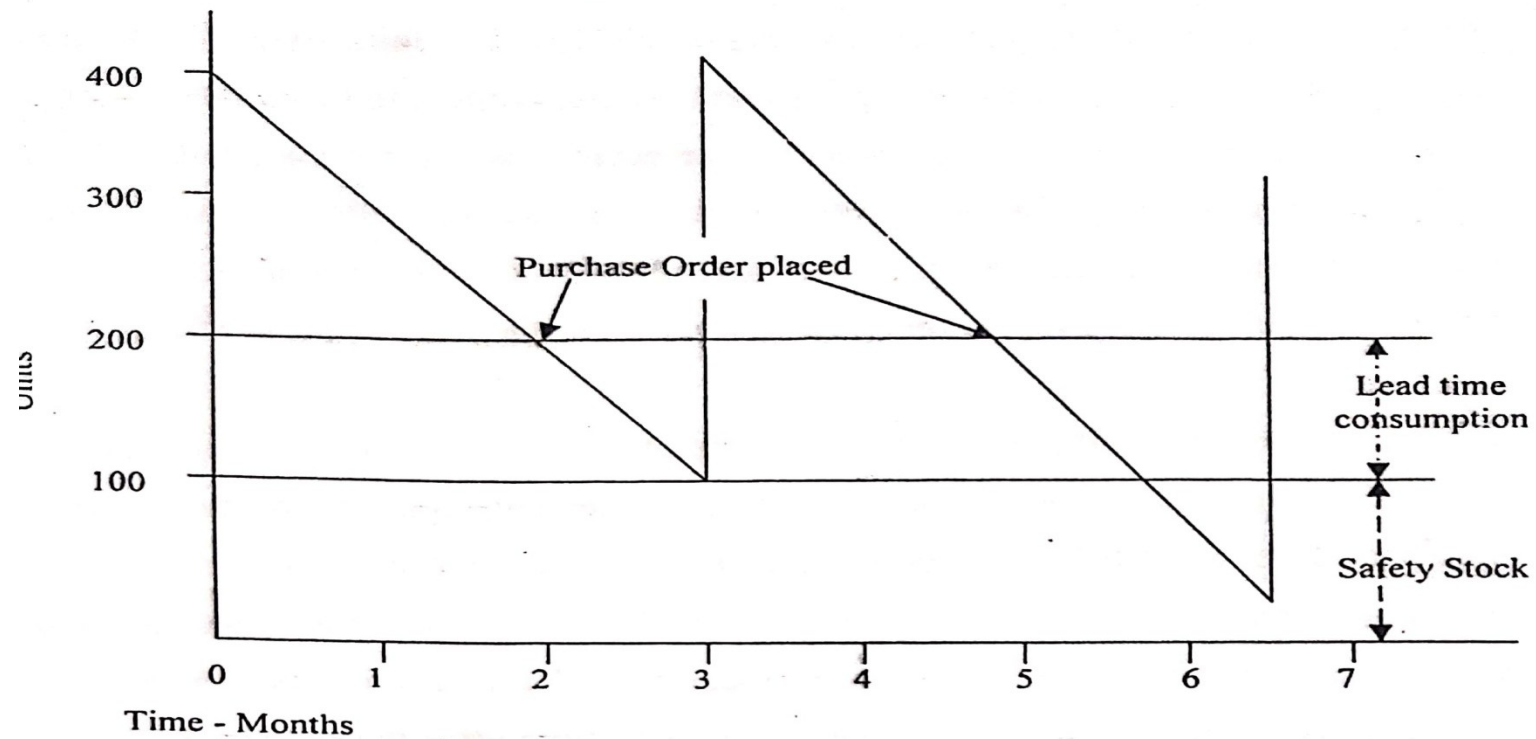
Maximum-Minimum System



Maximum-Minimum System

- In above model one maxima is order and the stock touches the level “B”.
- Then the consumption start and the stock touches Minimum Level “D”.
- “D” is the re-order point and one maxima is ordered.
- The consumption is continue till the stock touches zero level i.e. Point “C”.
- The time interval between D and C is called Lead Time.
- By the time stock reach “C” level, a fresh supplies are received and stock again reaches “E” level and the cycle repeat itself.
- In case we want to avoid stock outs at “C & F” we have to keep some buffer of safety stock as given in next model.

Maximum-Minimum System



Monthly Consumption	= 100
EOQ	= 300
Lead Time	= 1 month
Safety Stock	= 100

Maximum-Minimum System

- Stock order point = Minimum = lead time consumption + safety stock
 $= 100 + 100 = 200$ Units.
- “AB” shows the ideal position.
- It is assumed that the stock is 400 units. Consumption is started @ 100 units per months.
- At the end of two months the stock is 200 units which is stock order point (Minimum) and, therefore a purchase order equal to EOQ (Maximum) has to be placed. After one month the stock is depleted to 100 units but supply against the purchase order of 300 units is received which raise the stock level to 400 units.

Maximum-Minimum System

- “CD” is not a ideal but more commonly occurring position. The starting stock is 400 units.
- The consumption is higher than the forecast and therefore, the stock order point of 200 units is reached much before the two months. As soon as the stock reaches 200 units, a purchase order for 300 units (maximum) is placed. In the mean time the lead time has gone up and the purchase order of 300 units materialises sometime after the usual one month lead time.

Maximum-Minimum System

- Quantity to be procured: in actual practice it is rare that, with any particular issue, the stocks drop down to exactly the stock order point, i.e. the minimum, so that a quantity equal to EOQ i.e. the maximum, may be recouped.
- The stock recoupment formula which is universally applicable is:
- $$\text{Quantity to recouped} = \text{Maximum} + \text{Minimum} + \text{un complied demands} - \text{Physical Stock-Quantity due on order}.$$

Maximum-Minimum System

- Example 1:
- Maximum = 300 units.
- Minimum = 200 units.
- Stock = 200 units.
- This is a ideal situation
- Quantity to be recouped = Maximum + Minimum
+ un complied demands – Physical Stock-
Quantity due on order
= 300 + 200 + Nil - 200 - Nil
= 300 units

Maximum-Minimum System

- Example 2:
- Maximum = 300 units.
- Minimum = 200 units.
- Stock = 150 units. (large issue)
- Quantity to be recouped = Maximum + Minimum + un complied demands – Physical Stock- Quantity due on order
= 300 + 200 + Nil - 150 - Nil
= 350 units

Maximum-Minimum System

- Example 3:
- Maximum = 300 units.
- Minimum = 200 units.
- Stock = 150 units. (large issue)
- Demands on hand yet to be complied 50 units.
- Quantity to be recouped = Maximum + Minimum + un complied demands – Physical Stock-
Quantity due on order
 $= 300 + 200 + 50 - 150 - \text{Nil}$
 $= 400 \text{ units}$

Maximum-Minimum System

- Example 4:
- Maximum = 300 units.
- Minimum = 200 units.
- Stock = Nil. (large issue)
- Demands on hand yet to be complied 50 units.
- Quantity to be recouped = Maximum + Minimum + un complied demands – Physical Stock-Quantity due on order
= 300 + 200 + 50 - Nil - Nil
= 550 units

Maximum-Minimum System

- Example 5:
- Maximum = 300 units.
- Minimum = 200 units.
- Stock = 150 units. (large issue)
- Demands on hand yet to be complied 150 units.
- Stock on order 300 units.
- Quantity to be recouped = Maximum + Minimum + un complied demands – Physical Stock-
Quantity due on order
$$= 300 + 200 + 150 - 150 - 300$$
$$= 200 \text{ units}$$

Maximum-Minimum System

- In this system when a item is stocked in more than one depot. The reorder level of each depot depends on the rate of consumption. Therefore this system was leading to multiple purchase which was generating unnecessary ordering work and we were also loosing the rate advantage of Bulk ordering. Hence this system is more or less discarded for purchase items. However it is continuing for shop manufactured item.

Annual Estimate System or Fixed interval review system:

- In this system a fixed time table is followed for recoupment of items.
- **Contract Period:** The period for which items are recouped is fixed and is called 'Contract Period' and is **12 months**.
- **Interim Period :** The interval between the date fixed for generating the recoupment sheet and the beginning of the contract period is known as 'Interim Period'.
- **Dues:** Quantity of material for which purchase action started but material not yet received.
- **Covered Dues:** Covered dues are the outstanding quantities against all live Purchase Orders. This will happen when previous recoupment have been covered by issue of Purchase Order but the materials have not been supplied by the firm on whom purchase orders have been issued.

Continue....

- **Uncovered Dues:** uncovered dues are for which Purchase Order have not been issued on the firms or where partly issued, being the quantities outstanding against the previous recoupment.
- **Lead Time:** time taken between the date of recoupment need and physically receipt of materials in the stores depots.
- **Buffer Stocks:** It is an additional stored volume of goods which is kept to meet any unexpected future demand or supply fluctuations.
- **Pending Demand (PD):** Requisitions received from user departments which have not been complied due to low stock or Nil stock.
- The recoupment sheet is contain the following information: last 3 years consumption, stock in hand, covered dues, uncovered dues, Pending or uncompiled demands if any.

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- **Net Quantity to be procured** = (IP requirement + CP requirement + BS requirements) – (Stock + Dues) + Pending Demands.
- The system is advantageous in that it is possible to combine the demands of different depots and make one purchase for all the depots together.
- This reduces not only the ordering cost, but also gives a better bargaining power.
- In this system, Inventory carrying cost can also be kept low if order is placed with required number of purchased deliveries.

Fixed Level System:

- This system is essentially used for procurement of emergency stores, in whose case the demand is not regular. In this an upper limit of stock holding is to be fixed, preferably, with the use of statistical methods. Every time there is an issue, the item is recouped so as to bring the stock back to the fixed level.

Emergency Procurement:

- Whenever the physical stock of an item drops to “Danger level” defined generally as three months requirements and there is no immediate prospects of outstanding order materialising. An emergency purchase is proposed through a “Red Signal”. The purchase is limited to the quantity requirement to tide over the emergency but does not exceed three months requirements.

Thankx