UNIT 18   STORES MANAGEMENT

Objectives

After completion of this unit, you should be able to:

- understand the role of stores in an organisation
- appreciate the problems and benefits of centralisation/decentralisation of stores
- become familiar with the systems and procedures for stores management
- get an idea of the types of stacking arrangements and layouts employed in stores and their impact on efficient retrieval
- become familiar with different kinds of equipment used in storing and handling of materials
- become aware of the latest developments in terms of automated storage and retrieval systems.

Structure

18.1   INTRODUCTION

As all the activities in any organisation cannot be carried out at one point of time, storage is an inevitable process. It increases the value of the material by simply carrying it overtime; no transformation of any characteristics is desired. Thus stores in any company has a vital role to play. All other activities involving materials are in day-to-day touch with the stores. In a majority of manufacturing organisations material constitutes the major fraction of cost, i.e. 60 to 80% of total cost. The cost of capital blocked in inventories is substantial. If this part of working capital is not properly managed the subsequent losses may be enormous. The success of the business, besides other factors, depends to a large extent on the efficient storage and material control. Material pilferage, deterioration and careless handling may lead to reduced profits. Stores management is concerned with carrying the right kind of materials in right quantity, neither in excess nor in short supply, providing it quickly as and when required, keeping it safe against any kind of deterioration, pilferage or theft, and to carry out the efficient performance of all these functions at lowest possible cost.

18.2   STORES FUNCTIONS

The major functions of the stores are as follows:

a) Receipt: Receiving and accounting of raw-materials, bought out parts, spares, tools, equipment and other items.

b) Storage: Provision of right and adequate storage and preservations to ensure that the stocks do not suffer from damage, pilferage or deterioration.

c) Retrieval: Facilitating easy location and retrieval of materials keeping optimum space utilisation.

d) Issue: Fulfilling the demand of consumer departments by proper issue of items on the receipt of authorised purchase requisitions.

e) Records: To maintain proper records and update receipt and issue of materials.

f) Housekeeping: Keeping the stores clean and in good order so that the handling, preservation, stocking, receipt and issue can be done satisfactorily.

g) Control: Keeping a vigil on the discrepancies, abnormal consumptions, accumulation of stocks etc., and enforcing control measures.

h) Surplus Management: Minimisation of scrap, surplus and obsolescence through proper inventory control, and effective disposal of surplus and obsolete items.

i) Verification: Verifying the bin card balances with the physical quantities in the bins and initiating the purchasing cycle at appropriate time so as to avoid the out of stock situations.

j) Coordination and cooperation: To coordinate and cooperate with the interfacing departments such as purchasing, manufacturing, production planning and control, inspection, etc.

18.3   STORES ORGANISATION

Usually the following two kinds of organisation are adopted in relation to stores:

In type (a) organisation the stores is considered to be a materials function closely related to the receipt, and is clubbed with the purchasing or materials management department. This kind of arrangement is justified on the basis of following considerations:

i)   As the activities of stores are material oriented, it should report to a department whose primary interests lie in the materials and related operations.

ii) From the total control point of view the receiving and stores activities should be included with the rest of materials activities. This facilitates the coordination among related materials activities from the stand-point of operations. Further, the inter-relationship between stores, inventory control and purchase function will receive, proper attention in this type of organisational arrangement.

In type (b) organisation the issue in the face of stores is considered to be more significant and thus it is clubbed with the production department. The arguments for such an organisational arrangement are as follows:

i)   In order to run the production operation smoothly the production management must have control over the immediate material supply from stores. This will ensure the smooth delivery of materials to the production centres as and when required.

ii) In order to avoid/discourage any kind of collusion and embezzlement of materials, the receiving and storing should be kept separate from the purchase department.

The objectives of the organisational decision regarding stores could be to store and manage the materials so that they are available in good conditions according to the peed, to efficiently supply the materials recording to production schedules, and to perform stores functions at minimum cost.

In order to fulfil the objectives the organisation will depend on the situation under consideration. In addition to the reporting, an important consideration in organisational design. is the centralisation vs. decentralisation. Both the centralised and decentralised organisations of stores are practised. The advantages of centralised and decentralised stores organisations are as follows:

a) Advantages of centralised stores organisation:
i)   Effective and better supervision and control
ii)   Reduced personnel requirement, thus involving less related costs
iii)   Better and efficient layout of stores
iv)   Better inventory checks
v)   Maintenance of optimum stores
vi)   Fewer redundant and obsolete items
vii)   Provision of better security arrangements possible.

b) Advantages of decentralised stores organisation:
i)   Reduced material handling and associated work.
ii)   Convenient for every department to draw materials
iii)   Less risk of loss by fire etc.
iv)   Less chances of production stoppages owing to easy and prompt availability of materials.

18.4 STORES SYSTEMS AND PROCEDURES

The systems and procedures in stores can be broadly studied under four heads, viz. identification system, receipt system, storage system and issue system. The overall system of store functioning alongwith the major input-output documents at each state is shown in Figure I. A substantial amount of information is required, at every stage, for checking, controlling and feedback purposes. The stores systems have been discussed with reference to the physical system as well as the recording or information system.

Figure I: Stores Systems
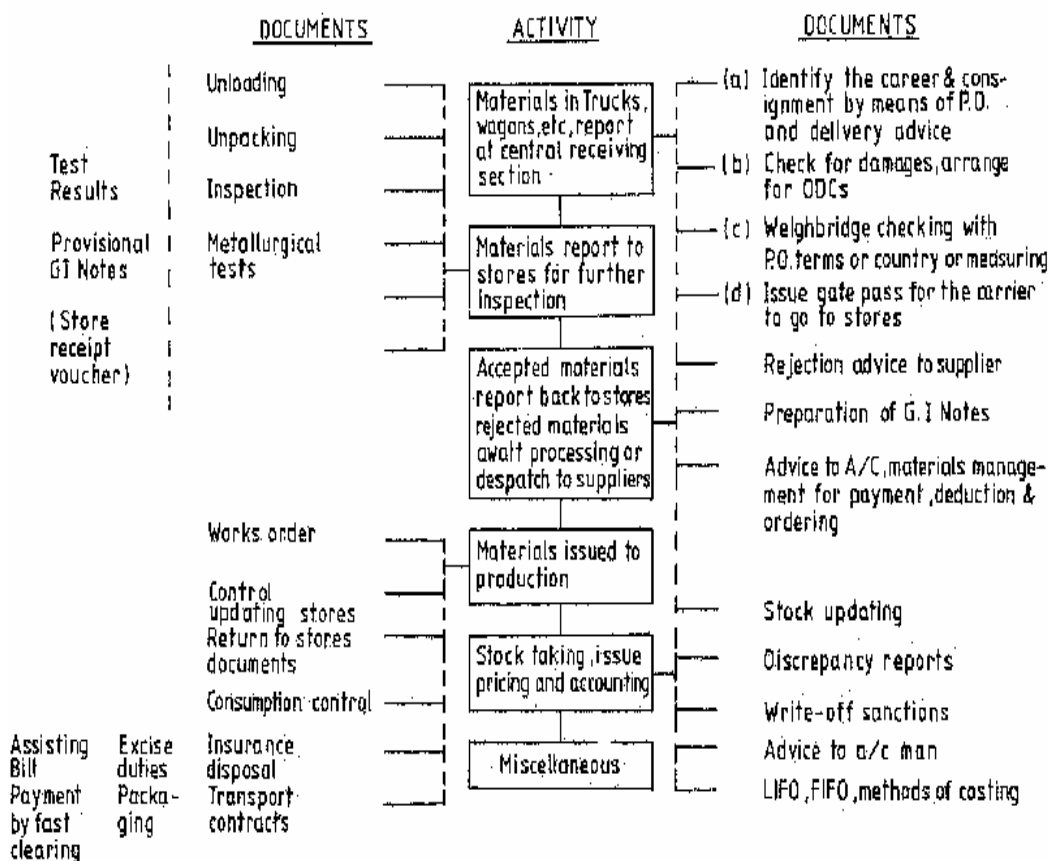
Identification System

The stores management is concerned with the design and control of the systems utilised in conducting the store activities. A large number of materials are being handled by a typical stores. Thus the development of an unambiguous and efficient identification system is the first responsibility confronting a stores manager so as to facilitate clear internal communication.

The physical description of each item is usually lengthy and imprecise to be taken for the purposes of identification in day-to-day operations. Moreover, it cannot be operated on mechanical or electronic computing devices, the use of which is increasing every day in automating the clerical operations of the stores. One kind of identification of the parts can be done with the supplier's part numbers. But each supplier has got his own codification system and it will be cumbersome to operate on these numbers for the identification of different parts.

Thus the need to develop a proper identification system to coordinate the activities of purchasing inventory control and stores departments with possible integration with the operations of design engineering, production and cost accounting can hardly be overemphasised. The use of codification of parts can be done in any one of the following ways:

a) Arbitrary approach: The inventory items are given an arbitrary number in the sequence in which these are added in the stores account. Clearly, each item gets a discrete number but there is no systematic relationship to the numbers assigned to related items.

b) The symbolic approach: This is a very systematic approach to the design of codification system. The codes assigned to different parts may be numeric or monemonic (alpha numeric). A numerical system assigns a six to ten digit code number to each item to develop the classification from broader to specific categories. This is illustrated with the help of following example:

The code number of an item is 152 43 25; the explanation is as follows:

First digit	1 General-class
Next two digits	52 Generic class
Next two digits	43 Subclass
Last two digits	25 Specific item number

This code is based on the assumption that there are maximum 10 general classes, 100 generic classes, 100 sub-classes in each generic class and 100 specific items in each sub class. If it is more than this limit in any of the categories, one more digit is to be added for that category. The general classification of the parts may be done as follows:

Code	General Class
1	Raw materials
2	Purchased parts
3	Manufactured parts
4	Work in process
5	Spares.

This monemonic or alphaneumeric system combines the numeric and alphabatic notations. This makes the visual identification easier because they are more descriptive and often shorter. Atypical example is

R	Ba.	RS	2T
↓	↓	↓	↓
Raw material	Bars	Round, steel	Specific number of size

As the number of good alphabetical symbols is limited the system may not work with larger number of items.

c) The use of engineering drawing number: The number in the engineering drawing at times is used as an identification number in the stores. This has the advantage of better internal communication as this number is used by other departments. But it has the major limitation that it can be only for manufactured items; for bought out items a separate system is to be devised. Further, it has the non-sequencing disadvantage of arbitrary system.

Receipt System

The stores department receives the stores both from outside suppliers and internal divisions and accordingly there are separate receipt systems. The system of receipt start much before the physical receipt of the materials in the stores. It starts with the placement of purchase order by the purchasing department, a copy of which is sent to stores. This is maintained in chronological order, so as to give an idea at any time about the volume of receipt, and helps in the planning of receipt, unloading,

unpacking and other related activities. Further, the supplies while despatching the goods normally send an advice note to the stores. This contains information regarding the date of despatch, carrier details, description of the consignment and value. Another document known as `consignment note' is prepared by the transport carrier and is sent to the stores concerned. These documents help the stores manager to organise and plan for expeditious clearance of materials to minimise costly demurrages.

On actual delivery the receiving department unpacks the goods received and checks quantity and condition of goods using weighbridges, measuring devices, tapes, etc., and tallies it with that in previous documents. There is a packing slip inside each package detailing the contents in package and usually it gives the purchase order number.

A 'Provisional Goods Inward Note' (PGI) or a `Materials Received Report' is prepared as soon as the materials are cleared from the receiving sections and sent for inspections. This gives information on materials code, quantity received, rate, date of receipt, carrier details, supplier details, location code and description of the material. All the items received are inspected and sample tested to ensure that the purchase order specifications are made. Results of the inspection are indicated in special testing report and a `Clearance Report' or `Rejection Note' is prepared and sent by inspection department to purchase, Production and Accounting departments. This forms the basis for the preparation of `Final Goods Inward Note' (FGI) as shown in Figure II. FGI indicates quantity accepted and quantity received in addition to the information provided by PGI. FGI help in preparing shortage reports, claims documents, making appropriate payments and recoveries in case of shortages.

Figure II: Final goods Inward note

Final G.I. Note

Material Part No :—		Serial Number :—
Description :—		
P.O. Reference :—		
Carrier details	Supplier details	Inspection report
Truck / wagon R/R: Consignment note	Supplier code Supplier name	Test Results Conclusions
Quantity received ————		Damage/Shortage :—
Quantity accepted ————		Shortage claim ref :—
Quantity rejected ————		
Sd/— Central Receiving Section Date :	Sd/— Inspection Department Date :	Sd/— Stores Department Date :

Copies to: Accounts   :   Attention bills / Insurance & claims
              Indentor   :   For information
              Materials   :   For updating and expediting
        Management Dept.
              Stores   :   For stock records and reference

In case of materials received from internal divisions or returned from user departments transfer notes or `Return to Stores documents' are used. In some cases, Stores Department also handle the scraps. Usually scrap cards are prepared to indicate the nature and weight of the scrap:

Storage System

A Physical Systems: The design of proper shortage system is very important for easy location, proper identification, and speedy issue to the consuming department. The commonly followed systems for physically controlling stores materials are: closed stores system, open stores system and random access stores system. A single firm can follow a combination of these systems depending upon the nature of production operation and the use of materials.

a) Closed Stores System: In such a system all materials are physically stored in a closed or controlled area, usually kept in physical control by locking. Only stores personnel are permitted to enter the stores area. Entry and exit of the material from the area is permissible only with the accompaniment of authorising document. Maximum physical security and tight accounting control of inventory material are ensured by such a storage system.

b) Open Stores System: In this system no separate store room exists. The material is stored as close to the point of use as is physically possible. Such a system finds applicability in the highly repetitive, mass production type of systems exhibiting a continuous and predictable demand, e.g. automobile assembly plant. The storage facilities are arranged at each work station as per requirement and availability of space. The storage facilities are open and worker has direct access to it; no authorisation document is needed.

The open type of shortage system expedites the activities, cutting down the retrieval time. Since material is used relatively quickly it is not subject to high rate of deterioration or obsolescence. This system places little emphasis on the security of materials . The materials used in open system should not be easily damaged or pilferaged.

The responsibility of stores in this system is to deliver the material to production areas and to devise satisfactory physical storage arrangements with production supervisors. The further responsibility of the materials stored in production areas rests with the production supervisors.

The paper work is also considerably less in open system, as it places less emphasis on accounting control. No perpetual inventory records are kept. The actual usage can be determined by finding the difference between the number of items in the beginning and end of the period.

c) Random Access Stores System: This is a typical kind of closed stores system in which no material has a fixed location, All materials are stored at random locations throughout the store room. However, similar types and sizes of storage equipment are grouped together. When an item enters the stores, it is stocked at the first available storage location for that particular group, and when it leaves the storage, location becomes empty for any other item of the same group.

Usually a paper-work control system utilising punched card data processing equipment is employed. On the entry of any particular items a punched card is prepared with stores address. The requisitions are run on an electronic device that matches the requisition with stored material record which contains the store's address.

The most significant advantages of this system is that it utilises the space more efficiently than a fixed location, system. Further, it provides greater flexibility by accommodating different materials and inventory mixes with some storage facilities.

This type of storage system has got certain disadvantages too. It is feasible for large scale operations and requires a costly control system using electronic data processing equipment. The preservation of record card is very important; if it is lost the item is also literally lost for indefinite period. Moreover, the physicaLstock verification without this is very cumbersome and time consuming.

B Store Records System: Development of appropriate recording system for stores is

important to provide right information regarding the physical inventory and accounting of the transaction. Two records are usually kept of materials and other goods received, issued or transferred, namely, on Bin (or Stock) Cards and in the Store Ledger.

a) Bin Cards: For each kind of material, a separate record is kept on Bin Card which shows details of quantities of each type of material received, issued and on hand each day. A typical Bin Card is shown in Figure III. The Storekeeper maintains the Bin Cards up-to-date and usually in duplicate. One card is attached to each bin on shelf containing the material and record remains with the storekeeper for reference. Some firms use the KARDEX System in which a Kardex is prepared and updated. Bin cards are also used as a check on the stock Iedger accounts in the material accounting division.

Figure III: Bin or Stock Card

BIN CARD

Bin No.....................

Material

Code No ....

Strores Ledger Folio...........

Maximum Quantity..... .. .-.--.

Ordering Level ... .

Minimum Quantity.................. ..

Date	Quantity Received	Quantity Issued	Balance	Remarks

b) Stores Ledger: It is identical with bin card except that here money values are shown. The store ledger may be maintained by a separate material accounting department. The entries regarding the materials ordered, received and issued are made from the purchase order, receiving section report and the material requisitions respectively.

Issue System

This is the last stage in the stores system. Issues can be of two kinds, i.e., issues to consuming departments, and issues to outside supplies for processing. In both the cases there are certain common requirements. The control of issues is regulated by production programmes. Based on the programme and the bill of materials work orders are prepared, Listing for each material quantity to be issued and the corresponding quantity of the component to be manufactured. Any material requirement over and above indicated in the work order quantity means excessive wastage and scrapping. Usually, the junior stores personnel are not authorised to issue beyond the work order quantity which brings an inbuilt control.

Normally, two copies of the work order or Material Requisition Form (shown in Figure IV) are prepared by the foreman or concerned manager which are forwarded by the storekeeper to material accounting division for pricing and entry in store ledger. One copy is retained there and the other is returned to the originating department Where it is used as the basis for a charge to the appropriate production order: Adhoc material requisitions are sometimes made. Periodically consolidated statements of such items must be prepared. When issues are made to outside supplies, controls have to be more formal and adequate enough to take care of payments and claims.

Figure IV: Material Requisition

Figure IV: Material Requisition

18.5 STORES ACCOUNTING AND VERIFICATION SYSTEMS

Stores Accounting Systems

Stores accounting is important from the point of view of estimating the cost of the product for pricing decisions. The costing of material has to be done both for the materials consumed in the production and estimating the value of materials held in stock.

For the purpose of costing the receipt of materials, the factors that should be included are material price, freight charges, insurance, duties, taxes, packaging charges etc. The prices quoted and accepted in purchase order may often be stated in various ways such as net prices, prices with discount terms, free on board, cost, insurance, freight, etc. All these factors should be appropriately accounted while costing for the incoming materials.

Another important accounting is to be done for the issue to production and of the stocks held at the end of accounting period. Let us discuss some of the important and frequently used system for this purpose:

a) FIFO System: This system known as First in First Out System is based on the assumption that the oldest stock is depleted first. Therefore, at the time of issue the rate pertaining to that will be applied. There is no `profit' or `loss' in the pricing arrangements. The value of the stocks held on hand is the money that has been paid for that amount of stock at latest price levels. In case of too many changes in price levels the FIFO System becomes unwieldy. Another limitations of this system is that it fails to provide a satisfactory answer to costing-returns from stores.

b) LIFO System: This system known as `Last in First Out' System is based on the assumption that the most recent receipts are issued first. As the lastest prices are charged in this system, it leads to lower reported profits in the periods of rising prices and this offers savings in taxes. In case of wide fluctuations in prices this system tends to immunise unrealised gains or losses in inventory. It has almost the same limitations as that of FIFO System.

c) Average Cost System: This is based on the assumption that issues to production department are equally made from different shipments in stock, i.e. an average cost of shipment in stores is charged. It stabilises the cost figures. The average is to be calculated by dividing the total cost with the number of items and is to be updated with every new purchase.

Figure V: Comparison of stores Accounting Systems

(i) Rising price levels:

(ii) Falling price levels
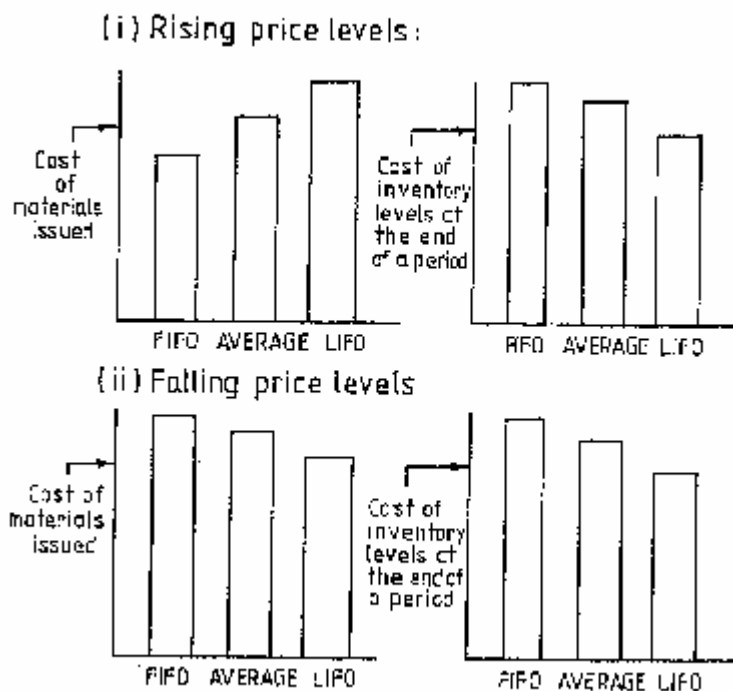
d) Market Value System: This is also known as replacement rate costing, in which the materials issued are charged the prevailing market rates. This system underestimates the stock on hand in the case of price increase, whereas it overestimates the stock on hand in the case of price decrease. This may in turn lead to writing off huge amount to make it realistic. Moreover, a continuous monitoring of the market rates for all materials makes the system cumbersome.

e) Standard Cost System: In this system a detailed analysis of market price and trends is carried out to determine a standard rate for a fixed period, say six months or so. This standard rate is charged to materials issued during this period irrespective of the actual rate. After the period is over the standard rate is reviewed and updated.

This system reflects the efficient use of materials as the fluctuation in rates is not considered in accounting. Moreover, it adds to clerical efficiency as the fresh rates are not to be obtained every time. However, similar to Market Value Approach, this also leads to underestimating or overestimating stocks on hand in case of rising and falling prices respectively.

f) System of Costing the Closing Stock: The general guideline for this purpose is to use market price or stock at cost, whichever is less. The cost of closing stock is governed mainly by price units, obsolescence and deterioration. In rare cases the stock may appreciate with time. Appropriate formulae to account for these factors should be developed keeping in view the past experience.

Stock Verification Systems

Some discrepancies between the actual and the book balances of inventories are bound to occur despite the diligent store keeping. The process of stock verification is carried out for following purposes:

i)   To reconcile the store records and documents for their accuracy and usefulness,

ii)   Identification of areas deserving tighter document control,

iii) To back-up the balance sheet stock figures, and

iv)   To minimise the pilferage and fraudulent practices.

Most companies keep an "inventory short and over" account to absorb such discrepancies, which is eventually closed into the manufacturing overheads account.

Some of the systems of physical stock taking are as follows:

a) Annual or Periodic Physical Verification: In this system the entire inventory is physically verified at the end of a period, usually the accounting period. That is, normally at the end of fiscal year. Stocks are closed for a few days. This may necessitate the shut down of production operations;.' the activities such as repair and overhaul of equipment and machinery are resorted to. A special crew of store inspectors and stores verifying officers, usually from the material audit, physically check each item and compare the entries on bin card and stores ledger. This leads to the formation of a list of surplus or short items. Damaged and obsolete items are traced and recorded. This needs to develop a detailed programme and schedule to complete the verifications, storewise and itemwise. Top management's sanction can then be sought for writing off deficiencies or valuing surplus.

As all the items are checked at one time there can be no confusion about any item being left unchecked.

b) Perpetual Inventory and Continuous Stock Taking System: In case of large firms dealing with a large number of items the final inventory system may take a lot of time and it may not be possible to shut down the whole plant. The perpetual inventory system is a more appropriate method for large plants. In this method the stock verification is done continuously throughout the year. Different methods are adopted by different firms for continuous verification.

Some firms divide the whole inventory into fifty-two equal parts. Each part is verified every week. Some firms record store balances after every receipt and issue, and a number of items are counted daily or at frequent intervals and checked with the bin cards and stores ledger. Discrepancies found, if any, owing to incorrect entries, breakage pilferage, over-issue, placing of items in wrong bins, etc., are investigated and corrected accordingly. The significant advantages of this system are as follows:

i)   The shut down of the plant is not necessary for stock checking/taking.
ii) The method is less costly, less tiring, less cumbersome and hence is more accurate.
iii) Discrepancies and defects in stores are readily detected and are not carried over throughout the year. This prevents damages and losses.
iv) Slow moving stocks can be noted and proper action can be initiated in time.
v)   The stock items are kept within the limits.

c) Low Point Inventory System: Some companies take the physical inventory, i.e. the stock level of stores is checked generally when it reaches its minimum level.

18.6   STORES ADDRESS SYSTEM

The storage and retrieval are matched processes. The quick location of any item in the stores is required to minimise the retrieval delays. It is possible only when there is definite place for keeping each item and the item is kept there. Moreover, the address of that place is conveniently defined.

A variety of stores address systems are used to address storage locations. A typical address system is shown in Figure VI. In this system, the store room is divided into blocks; each block is identified by a lateral block letter and a longitudinal block letter. Every row of shelves, within each block, is given a number. Each row is divided vertically into columns and horizontally into shelves. A particular bin is identified by a six digit, alphanumeric address code as follows:

    First digit   - Lateral block
    Second digit   - Longitudinal block Next two digits - Row
    Fifth digit   - Column
    Sixth digit   - Shelf

Blocks and rows should be clearly identified with painted signs. Columns and shelves are counted from lower left corner.

Every item carried thus has a specific store location address in the form of a code, which may be written in the inventory catalogue, or a separate store location index may be prepared. The location code should not be confused with the material identification code.

Figure VI: A Typical Store Address System
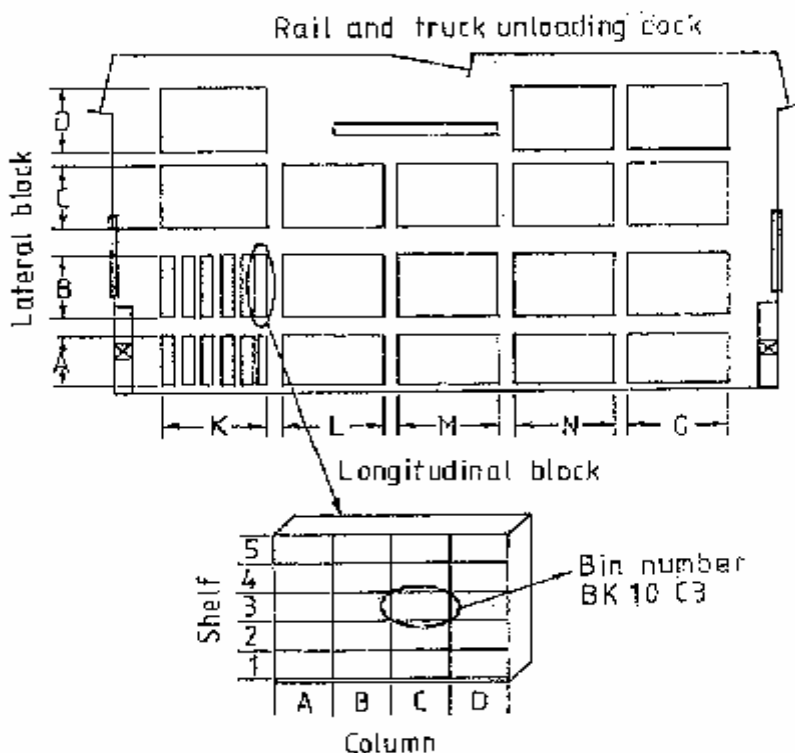
18.7 STORE LOCATION AND LAYOUT

Store Location

The location of stores is a strategic decision which if once taken cannot be easily undone. It would be extremely costly to change the storage location at a later stage. It should be carefully decided and planned so as to ensure maximum efficiency. The optimal location of stores minimises the total transportation, handling and other costs related to stores operation and at the same time provides the needed protection for stores items. The models of facilities planning can be applied to determine the optimal storage location in large size organisations. Store location depends upon the nature and value of the items to be stored and the frequency with which the items are received and issued to the different departments. Other important factors governing the location are the number and location of end users, variety and volume of goods to be handled, location of the central receiving station and accessibility to rail or road links.

In general, stores are located close to the point of use. Raw-materials stores is usually located near the first operation (in case of line layout), inprocess stores near to subsequent operation, and finished goods stores near the shipping area. The tools and supplies stores is located centrally to the personnel and equipment served.

In big plants it may not be possible to locate the stores which is convenient to all the departments and at the same time near to the receiving section. Usually a central stores is located near the receiving section and the issues are decentralised by setting-up substores conveniently located to serve user departments.

The location and building up of stores should be done with a futuristic outlook. The provision for the new departments and the increase in the volume to be stored should be kept.

Layout and Design of Stores

The efficient layout and design of stores is very important from the point of view of its functioning which is linked to the overall functioning of the plant. A good layout must bring the point of origin, store room and point of use in adjacent and proper reference of best material flow. The planning and design of stores should be carried out with the following objectives in mind:

i)   To achieve maximum ease of operation with ready accessibility of major materials.

55

ii) To achieve minimum waste of space and flexibility of arrangement.

iii) Minimisation of material handling requirements.

iv) Minimisation of material deterioration and pilferage.

To assist the planning to meet the objectives, following information should be generated from the records:

i) Classification of store items by size, number, weight, frequency of handling (FSN-Fast moving, Slow moving, Non-moving), handling arrangements, perishability.

ii) Space requirement to store the item.

iii) Units withdrawn at a time

iv) Maximum number of units to be stored at one time.

v) Storage facility best suiting the item.

vi) List of available storage space for different kinds of storage facilities.

vii) Size and shape of the space available for laying out the stores.

viii) Prepare a flow diagram of the flow of materials through the stores.

ix) REL Chart for the storage of different classes of materials can be prepared.

While planning the layout and design of the stores, following factors should be considered:

i) The space for receipt and inspection should be provided adjacent to the main stores.

ii) Use of third dimension must be made effectively.

iii) Different storage facilities should be situated in clearly defined lanes, so that items are quickly stored and located.

iv) Main lanes or aisles should usually be 1.5 to 3 metres wide, depending upon the type of material and the amount of traffic involved.

v) Clear markings should be made at storage space to facilitate location and identification.

vi) The fast moving items should be stored near the dispensing window; the slow moving should be away from the window.

vii) The layout should permit the use of modern material handling equipment.

viii) Stores layout should encourage the FIFO, i.e. the old stock should be used earlier and the storekeeper should not be compelled to keep the new stock above the old one.

ix) Due space should be left for expansion purposes in each portion.

x) A pleasing and hygienic environment must be provided within the store room.This may be done by proper selection of the colour of walls, provisions of exhaust removal, provision of cleaning etc.

xi) Adequate and clear lighting arrangements should be provided.

xii) Adequate safety provisions including fire fighting equipment, alarms, accident control and prevention methods should be inbuilt in the store room design.

xiii) Special facilities, such as cold room, heating equipment, air-conditioning etc., if required, should be carefully planned in advance.

18.8 STORE EQUIPMENT

The different kinds of equipments which are used in a store room can be broadly classified into two categories, viz., storing equipments and material handling equipments. A judicious selection of different store equipment is a key to the successful operation of a store room.

Storing Equipment

The commonly used equipment in a store room are as follows

i) Platforms

ii) Pallets and skids

iii) Cabinets

iv) Stacking boxes

v) Special storage racks

vi) Gravity feed racks

vii) Outdoor plattorms and racks

viii) Open and closed shelves

ix) Bins

x) Trays

xi) Drums

xii) Barrels

The selection of the equipment shall be governed by the size ,shape , other physical characteristics , and the extent of preservation required . An open type of shelving should be preferred for easy accessibility unless the nature of the item needs a closed should be carefully done . The steel equipment of 'knock down' variety that can be assembled and reassembled in different forms in numerous standardised shapes and sizes offer more flexibility . Steel equipment have advantages of strength , cleanliness and fire resistance.

Material Handling Equipment

The common type of material handling equipment used in stores are as follows :
i) Trolleys
ii) Fork-lift truck
iii) Hoists
iv) Monorail
v) Belt conveyor
vi) Roller conveyor
vii) Crane

The selection of the material handling equipment depends upon the size , shape and weight of the items , the location of the item in the stores , etc

18.9   AUTOMATED STORAGE/RETRIEVAL

Significant developments have taken place in the area of stores management in the past few decades . The concept of a totally automated storage and retrieval system has past few decades. The concept of a totally automated storage and retrieval system has been inviting the attention of professionals to match the storage system with the rapid developments in the technology. High rise storage systems have been commonly used in advanced countries . Automated material handling systems are used for the unit load type storage retrieval system .But for the system in which different quantities of different items are to be retrieved the semi-automatic kind of materials handling with manual operator are used .the operator carries with him the list of items to be retrieved .By making use of pre-defined system he goes through the store room , stops the handling equipment at respective bins and completes the list in a picking tour. He may go aisle by aisle or according to items in list or by any other system. Operations Research techniques of sequencing routing ,etc., can be applied to determine the optimal locations of items and optimal route in a picking tour . Some of the system to improve the efficiency of automated storage/retrieval systems as follows:
i) Sequencing in an optimal way by picking tour.
ii) Allowing a single operator to perform all storage and order picking operations in an aisle.
iii) Generating a picking list based on a single customer's order.
iv) Storing items in pairs , e.g. nuts and bolts.
v) Locating items from the rack as per the structure and importance of orders.
vi) Allocating all items related to a specific facility to a single aisle.

18.10 CONCLUDING REMARKS

The storage system forms the key component of any materials managements system . the efficient planning and design of the store system is very much important for the efficient and smooth operation of any plant. Due consideration should be given to the

design of the store system of both physical and information processing. The stores system closely interacts with other sub-systems and these interactions must be clearly understood and interpreted. Efforts should be made to incorporate the latest developments in the area of stores management so as to provide the right kind of service at the right time with adequate preservation of the items and minimum blockage of capital.

18.11   SUMMARY

In this unit we have identified the basic functions of stores in an organisation. Effective Storage of goods is vital to the success of any organisation and efficient management of stores leads to higher productivity, fewer delays and lower overall costs.

The need of a proper identification, receipt and storage system has been highlighted. This is followed by a discussion of stores accounting and verification systems.

Systematic procedures to identify the location of an item in stores go a long way to reduce retrieval time. Some stores address systems 'have been presented in this regard.

The location and layout of the stores deserve careful consideration as do the various storing equipment like bins, racks and other material handling devices.

Finally the basic concepts of automated storage and retrieval have been presented.

18.12   KEY WORDS

Automated Storage/Retrieval: This refers to the use of automatic or semi-automatic material handling devices programmed to store or retrieve items in a store very efficiently.

Identification System: A system to give codes (numeric or alphanumeric) to various items in store for easy identification and record keeping.

Receipt System: The procedure to monitor the receipt of goods in a store with indications of the condition of goods (satisfactory or otherwise) at delivery.

Store Accounting System: Collection of relevant data for estimating the cost of the product for pricing decisions.

Stores Address System: A procedure by which each store item has an address or a location for quick storage or retrieval.

Storage System: The manner in which goods are physically stored.

Stock Verification System: A check of the actual items in stock physically in the store with those in the record books.

18.13   SELF-ASSESSMENT EXERCISES

1   Discuss the major function `stores in an organisation.

2   What are the advantages and disadvantages of centralised store room facilities?

3   What are the advantages and disadvantages of decentralised store room facilities?

4   What problems exist when a company attempts to use suppliers' part numbers in its material identification system? Comment upon the options the company may have in designing its own identification system.

5   Why is stores, accounting important for a firm? Discuss various systems that may be followed and their impact on product pricing.

6   Discuss the use of perpetual inventory record in both the closed and open stores systems.

7   How would you choose the best location for a new store?

8   What are the objectives of good store room layout? Explain.

9 What do you understand by automated storage and retrieval? For what kinds of goods and in which companies in India do you think such systems would be appropriate?

10 You have been given the responsibility of making a study of an existing store room and of taking charge of its reorganisation. Outline and explain briefly the approach you would use in planning this undertaking.

18.14   FURTHER READINGS

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