Ordnance Factories Institute Of Learning, Ambarnath 421 502.

Index of Course Material for Short Term Course on "STORES PROCEDURE"

Stores Functions

1. DEFINITION:

The terms stores, storehouse, or warehouse signify a building or room where materials are kept.

Store keeping relates to safe custody & preservation of the materials stocked in the store—room, of their receipt, issue & accounting. The task is to provide what is required, when it is required, in the condition in which it is required and do all these things efficiently and economically.

Store-keeping adds nothing to the value of a product. It is a cost with no return & hence the importance of economic operation, keeping of course efficiency at a desired level. The cost, components consist of the capital expenditure on land, building and roads, yards, equipment, machinery & other facilities provided. The revenue expenditure consists of salaries & wages, insurance, maintenance costs, stationery, communication expenses and the cost to maintain the inventory at an average low level.

2. OBJECTIVES OF THE STORES FUNCTION

The stores in an organization is primarily intended to assist in the production of goods or services and no industrial unit or public undertaking of any substantial size can be efficiently, managed without it. The primary objective is to provide a service to the operating functions and this must be fully appreciated. All the other activities, although they have their own relative importance, are subordinate to this main responsibility.

The service given can be categorized into four parts as follows:—

(i) To make available a balanced flow of raw materials, components, tools, equipment and any other commodities necessary to meet operational requirements.

(ii) To provide- maintenance materials, spare parts and general stores as required.

(iii) To receive and issue finished products.

(iv) To accept & -store scrap and other discarded material as they arise.

RESPONSIBILITIES OF THE STORES FUNCTION:

It has been emphasized that service is the principal objective of the store function, but it is obviously desirable to provide that service economically. The most important consideration here is to maintain the value of stores in stock (i.e. the inventory value) at the lowest practicable level at all times, in order to economize in the use of working capital and to minimize the costs of storage. It will be readily understood that there is some conflict between the need to give

good service as the more stock that is held, the easier it is to have required items readily available on demand, while on the other hand, the more stock that is held, the greater the cost incurred. It is necessary to seek**,** find and operate a satisfactory compromise between these two opposing forces and in addition to see that the stores organisation itself is economically worked and co-operates with other functions in securing saving in internal and other costs wherever practicable.

Other matters for which the stores function is normally responsible are listed below:-

1.Identification	2.Receipts.
3. Inspection	4.Storage and preservation
5. Materials handing	6. Packing
7. Issue & Despatch	8. Stock Records
9. Stock Accounting	10. Stock Control
11. Stock Taking	

ELEMENTS OF GOOD ORGANISATION:

An important first step is to organize the activities of the stores so as to achieve the desired objectives, working through the plan. Based on the activities enumerated earlier, it is necessary to group them appropriately so that relevant groups may be assigned to a section or a Division with Managers in charge, with delegation of authority commensurate with their responsibilities to enable them to contribute their mite to the attainment of pre-selected goals. Adequate organizing would enable the most effective use of both the physical assets of the business as well as the human resources.

A GOOD STORES ORGANISATION SHOULD HAVE

(a) Definite and clear cut responsibilities for executives.

(b) Responsibility should always be coupled with authority.

(c) Change should be made in the scope of responsibilities of a position without a definite understanding to the effect on one part of al 1 persons concerned.

(d) No executive or employee, occupying a single position in the organisation should be subject to definite orders from more than one source.

(e) Any executive whose work is subject to regular inspection ' should ' whenever practicable, be given the assistance and facilities necessary to enable him to maintain an independent check of the quality of his work.

Organisation can be regarded as the establishment of authority relationships, with provision for structural co-ordination both vertically ond horizontally, between positions to which have been assigned specialized tasks required for the achievement of enterprise objectives. It is thus the structural relationships by which an enterprise is bound together and the framework in which individual effort is co-ordinated".

STEPS TO BR TAKEN FOR PROPER STORE ORGANISATION

(i) Identifying and grouping of the work.

(ii) Defining and delegating responsibility and authority.

(iii) Establishing structural relationship so that the individual efforts are coordinated.

According to Peter Drucker, organisation is not an end in itself, but a means to the end of business performance/results. Organization is an indispensable means and the wrong structure will seriously impair business and may even destroy it. Organisation structure must be designed so as to make possible the attainment of the objectives of the business over a period.

ORGANISING THE STORES DEPARTMENT:

Traditionally, the stores were attached to Production department & considered part of it. The finished goods stores was attached to the Sales Departments. Today it has been recognized that both Production and sales have vested interests which conflict with the basic objectives of inventory control. As such the modern concept is to delink stores from production or sales. The best practice, is to place stores under the Materials Manager and make it part of the Materials Department. The Materials Manager will have the status of other senior Departmental heads like Production, Sales or Finance, who report to the Chief Executive.

Stores organisation may be defined as' a systematic co-ordination and combination of efforts in a manner as would result in maximum efficiency with minimum expenditure of money.

It must contain itself into formulation of a sound financial policy, efficient and elaborate planning.

The stores department can be divided into the following Divisions/Sections:-

(1) A Central stores with sub-stores 1,2,3. (The Central Stores according to products and Sib-stores according to shop requirement).

(2) Receipt Stores. (3) Inspection.

(4) Finished Goods Stores. (5) Packing Section.

(6) Despatch Stores. (7) Transport and Material Hand ling Sect ion.

(8) Clearing Unit- Sea, Air, Rail. (9) Stores Housekeeping

(10) Stock-taking/Audit (11) Record Keeping (Kardex/Stock Ledger)

DUTIES AND RESPONSIBILITIES OF STORES PERSONNEL:

The Store Keeper has several duties & responsibilities, which he may carry out himself or through his subordinates. These are:

(a) To receive materials including all work connected therewith like opening of packages etc.

(b) To keep materials in the right place and in the manner best suited and prescribed.

(c) Ensure materials are properly preserved by periodical inspection and taking correct preservation measures as called for.

(d) Maintenance of Bin Cards and stock (kardex) cards in the manner prescribed.

(e) Carry out a all movement of stores including movement to storage from the Receipt Section and storage to despatch packing, forwarding etc.

(f) Receipt of indents & their scrutiny as well as issue of materials as per laid down standards and procedures.

(g) Maintain complete, up-to-date & correct records both for physical storage & Financial accounting.

(h) To take all steps for the replenishment of stock and raise indents for purchase.

(i) To attend to all correspondence.

(j) Maintain proper relationship with all concerned Departments and ensure there is adequate co-ordination with all wings of the organisation.

(k) Ensure by taking all steps necessary for safety and security in the stores.

(l) Complete stocktaking as per company policy.

(m) Send periodical reports to Management on Stores performance.

The store keeper is in overall charge of the stores and is responsible for its efficient & economical working.. He is responsible for all the goods lying in the stores and for the compliance of all statutory regulations for the custody of the store. He is responsible for the safety of the goods and for any theft, pilferage, damage or spoilage that may occur.

The storekeeper's function may be compared to that of a cashier. After all, material is money and as much attention should be bestowed on materials as on

money by a cashier.

CENTRALISED AND DECENTRALIZED STORES:

What should be the set up of the stores major in organisation? A very big factory having a number product lines can have a main stores which can serve as a base, with decentralised stores for each of production preferably located as near the unit as possible.

Another possibility is that the main stores can be completely eliminated and supplies effected directly to the unit stores. A large company marketing a variety of goods may have a central warehouse of finished goods at its factory location plus a large number of stock points at various areas.

Centralization or decentralization then is a matter of convenience. However, one basic organizational feature must be observed. The entire stores set-up should be under the control of one Department with one senior Controller of stores. It is only then that one can efficiently achieve the objectives of the stores function.

Advantages of a Centralized Store;

(1) A wider range of goods is provided for all users that which is possible in smaller stores.

(2) Inventory can be minimum. This is especially so in the case of tools, fixtures, equipment, spares etc.

(3) Better Control is possible.

(4) Economies in storage space .is possible. Goods in bulk will occupy less space.

(5) Bigger storehouse enables better and more modern handling methods (mechanical or automatic).

(6) Delivery at a single point enables to decrease cost of delivery.

(7) Receipt and inspection of goods can be more efficiently organized.

(8) Opportunities of standardization are improved.

(9) Stock turnover is increased and probability of deterioration during storage is decreased.

(10) Lesser number of men will be required for managing the stores. A large amount of duplication of records takes place in decentralized stores. For example one may have say ten different kardex cards for the one material stocked in 10 places. Similarly, accounting work is multiplied.

DISADVANTAGES;

(1) Extra handling is involved and staff will be required for transportation from the stores to the various production units.

(2) If the system is not well organized there can be severe shortage at the work place which can cause unnecessary interruptions in production. Inefficiency can also result in production keeping away some buffer inside the unit which can firstly lead to cluttering up space and secondly can lead to pilferage because of the absence of security as in a store.

(3) More internal documentation may become necessary.

(4) If a fire takes place there is a greater risk because the entire stores can be lost and production can come to a total halt.

Types of Stores

As will be quit apparent, there are myriads, of types of materials which are stored depending upon the type of complexity of the industry which the stores serve. There can be small items like nut's and bolts or heavy items like steel plates, there can be yeses in cylinders (like LPG or oxygen,; powders, liquids some of them dangerous like Sulphuric acid or inflammable, like petrol and so. on. The variety is almost infinite.

Very broadly stores are divided into two types on the basis of the following considerations -

(a) Functional i.e. depending on the use to which the material is put to; and

(b) Physical **i.e.** in terms of size and distance like Central Stores, Sub-Stores and so on.

a) FUNCTIONAL STORES:

1. Raw material stores.	2. Production stores.
3. General Stores.	4. Tools Stores.
5. Salvage store.	6 . Packing stores.
7. Spare parts stores.	8. Receipt Stores.
9. Quarantine stores.	10. Finished Goods stores.
11. Work in progress store	12 Stationery Stores
13. Bonded Stores.	14. Hefriyerated Stores.
15. Flammable materials Stores.	16. Dehumidified Stores.
17. Transit sheds.	18. Dry Tank.
19. Shed Stores.	20. Open Yards.

b) Physical considerations;

There can be various types of stores based on the quantity of stocks held or distance from the point cf usage like Central Stores, Sub-Stores, Transit. Stores, Site stores etc.

Whether the company would like to specify 7SX or S0X as cut— *off* point; it is entirely left to the management to decide; it all depends upon how effectively one csn control these items taking into consideration the elaborate back up system one requires to collect information for decision making-Similarly

certain cut-off point could be decided for B class items. The class C items will be those which not included either in A or B category. Typical A,B,C, classification is illustrated -For the-above example.

Class of items	Number	Percentage of Items	Percentage of value of consumption
A	3	15	42
B	7	35	43
C	10	50	15
TOTAL	20	100	100

Having classified the items into A or B or C category the task before us is to identify those limited items which if controlled would result in better inventory management and then identify the areas for control. The control may be excercised in any of the following forms-Reduce the investment in inventory so that you carry only just enough stock to meet the future demand.

* Minimize indirect expenses associated with inventory by effectively utilising the personnel, storage facilities, material handling equipments, & etc.

The next task after identifying the area for effective control is to develop a formal system so that the objectives of cost minimization could be achieved. The following are some of the Guidelines for formalizing the control system.

* Review all the A items once in a month. This can be any time interval depending upon the ' nature of activity.
* B items can be reviewed less often.' Can be once in 3 months.
* C items can be reviewed once in 6 months or once in a year.

A. Central Stores:

This can be a central store serving three or' four factories or several shops in a very biy factory or it can be a central warehouse containing finished goods. The word 'Central' only denotes that it serves various units each of which may have separate sub-stores or departmental stores. Central stores also exist in multi-plant situations. One of the problems in having a central store is the handling costs involved in transferring materials to the sub-stores or shop floor. Usually therefore the central store is located at the point of greater usage.

One of the main control factors in the establishment of a central store is to ensure that unnecessary inventories are not built up by the sub-stores or for that matter by the central stores. For purposes of inventory levels-the total stocks in the sub-stores and the central stores should be considered as one .

b. Sub-Stores

Sub-stores are located the place of usage. It can be given within the shop floor.

c. Departmental stores:

This serves a department of a factory. For example - in a textile mill there can be several departments like spinning, weaving, bleachiny, printing etc. each of which can be served by separate stores. The reason behind it that each require separate type of materials. Tne store becomes a specialized store. Actually there need be little difference between *b &* -c

a . Group Stores:

In some companies it can happen that several factors belonging to the same group are all in one compound. Fcr example the J ,K . Group of industries has several factories belonging to the same owner which have been set up in one biy industrial estate. For example there can be a garment factory, a radio factory, a chemical plant, and a foundry all belonging to one group and located at the same place. One store can serve all these units. This is called a group stores.

e. Transit Stores:

As its name implies these are stores where stores are stored for a temporary period.

f. Site Stores.

This is a store usually at a project site containing building or construction stores like cement, steel, tools etc.

2. LOCATION OF STORES:

The first question that arises in regard to the stores is its site. Where shall we site . them? Will there be one stores or many? Should it be attached to the building of the production Unit or be away from it? What transport facilities shall be attached road, rail.

These questions stem from one primary question whom does the stores serve and what services should it provide. It should provide this service most economically and efficiently.

3. STORES BUILDING:

There are various types of buildings-, which are used for storage.

(a) A one storeyed building with a huge open interior divided into compartments through fixed or movable partitions**.**

{b) A multi-storey building.

(c) Temporary stores huts (.movable) Made of light metal, used for temporarily storage of items, can be assembled easily. Used for mining project stores etc.

(d) Temporary stores huts (immovable) This hut is used for short period during emergency. These are made of bricks and are demolished after use. For roofing G.G.C. or C.G. sheets are used.

(e) Nissan huts: Are useful for bulk stores and are Very economical. Roofing is made of corrugated G.I. or M.S. sheets in semi-circular shape. It has only steel sliding doors and is fire proof.

(f) Romane huts: these are bigger in size than Nissan huts and the roof is flat type with normal shape.

(g) Store yards: Heavy and bulky items like iron, mild steel, wooden logs etc. can be preserved in open as climatic conditions do not effect them. provided appropriate preservatives are applied. Only adequate security arrangements by way of barbed wire, rope etc. and watch and ward are necessary. Yards cover a good amount of land.

STORE IDENTIFICATION AND CODIFICATION

Today we are in an era where 'Scientific Management' -in many areas of Industry and Technology is finding its rapid application. Scientific management calls for an integrated - relationship with the behavioral science. In the field of 'Material Management' stores identification and codification is the key-note. If one could study and analyses the extent of codification, he can see the results for himself.

How do we identity a material or stores item? Usually by its name, for example if I want a bulb I will have to specify its candle power, whether it is plain or milky white, its make, its size and any other special characteristic that it may have like a screw type etc. There is a famous case of a factory that a plain single diameter pin had 3 names and was stocked in 3 different places because there were 3 users for it and each shop floor called it by a different name wise Pin, Dowel, Pivot pin. Image the cost of processing 3 different supply orders for their purchase, having 3 bincards, 3 ledger sheets and so on after reading this, one cannot escape the feeling that it is absured, but then what happened in the past, that good number of similar items are having more than one LF Nos. in "99** series. It is difficult task to check the duplicate or triplicate LF Nos. for a same type, of item in "99" series, but the same can be checked in codified LF Nos. Hence die necessity of simplifying the entire system; This is done by having Scientific store identification system.

TEN DIGIT CODE STRUCTURE

This 10 digit code is not a random number and the different digits of the code signify the characteristics of

The item so that just at a glance it would be possible to have some idea of the coded item like material specification, shape,-size, etc.

MAJOR GROUPING : The first two digits of the code indicate the major category viz:-

MAJOR CODE	CATEGORY OF ITEMS.
01, 02, 03 & 04	Steel/Ferrous alloys.
06, 07 & 08	Non-ferrous metals/alloy.
10	Chemicals,Paints, Fuels, Laboratory equipment
13	Abrasives, Grinding Wheels & Oil Stones.
14	Paper, Boards & Containers.
15	Electrical Items.
17	Iron mongery, Electrods & Welding rods.
18	Pipe and Pipe Fittings.
19	Building materials, refractories. Crucibles & Heat Insulators.
20	Mechanical Spares, Bearings, Belts, Chains & Rope.
21	Textiles, Harness, Saddlery, Leather, Rubber items etc.
22	Timber Items.
23	Fire Fighting Equipments.
25	Miscellaneous Items.
40	Hand Tools.
41	Machine Tools.
42	Special Type Tools.
43	Gauges & Measuring Instruments.
60-69	Ammunitions and Components.
70-79	Weapons and Components.

Example - 1. :Lamp electric, tugston filament General Service with rating of 230 volts, 100 watts, bayonet cap. Gas filled and clear finish as per IS:418 is represented by:- 1524104041

where 1st & 2nd digit code No. 15 indicate the item is Electrical.

3rd & 4th digit code No. 24 indicate the item is Bulb

5th & 6th digit code No. 10 indicate the item is Bayonet Cap.

7th & 8th digit code No. 40 indicate the item is 230 Volts.

9th & 10th digit code No.41 indicate the item is 100 watts..

A code number is given in terms of the material and not what it does or is used for. Any material therefore will have only one code number irrespective of item. A good coding system helps in the following ways.

1. It enables accurate identification of items.
2. It avoids duplicate stocks under different description.
3. It enables reduction of varieties and sizes.
4. Arrangement of bin cards, LF Sheet Account Records etc. in a uniform manner is made possible.
5. It enables the mechanization of records.

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CARE & PRESERVATION OF STORES

PREAMBLE:

Considerable importance should be attached to the preservation of stores. "Inter Services Stores Preservation Organisation formed by Government will be responsible for safe guarding Defence Stores from the ravages of biological as well as non-biological attacks and deterioration while in storage .

Inter Servi ces Stores Preservation Committee :

(a) With the following advisory body, an Inter Service Committee exists within

the I.S.S.P. Organisation: -

Chairman - Director of. Research & Development (General)

Members - Representatives of Ministry of Finance (Defence), H.O. (Director of Stores); Air H.O. (Equipment Branch); Engineer-in-Chief, A.H.O.; Director of Supply & Transport; Director of Ordnance Services; Directory of Remounts, Veterinary & Farms; Director General, Armed Forces Medical Services and Director General. Ordnance Factories.

Secretary - Secretary, I.S.S.P. Organisation.

This Committee will meet quarterly or as otherwise required, in New Delhi for detailed discussions regarding all matters relating ,to the I.S.S.P.O. and will be controlled by the Controller General, Defence Production. .Ministry of Defence.

(b) Functions of the Committee will be (i) to make recommendations regarding the policy of the I.S.S.P. Organisation (ii) to consider and make recommendations regarding the prevention of deterioration in service stores in the light of reports submitted by the I.S.S.P. Organisation, (iii) to co-ordinate the activities of the I.S.S.P. Organisation in all services/Bram-hea/Dlrect rates & where necessary, ensure implementation of that Organisation's recommendations.

DGOF's representative on I.S.S.P. Committee:

The Deputy Assistant Director General (Stock Verification) will act as the representative of the DGOF to serve on the I.S.S.P. Committee.

Preservation of Stores:

The scheme of stores preservation will be applicable to Factories.The I.S.S.P. Organisation will issue recommendations regarding the methods of preservation of stores to avoid any deterioration in storage or in transit. Standard recommendations will be published through I.3.5.P. Technical Bulletins and Literature and circulated to all Factories by respective Command Headquarters. Advice required in respect of any particular store or method of treatment will

also be furnished when requested or as ascertained in site during tours of inspection.

Publication, propaganda and enforcement:

(a) The knowledge gained by the trained personnel should be put to the fullest use, in applying it to their own particular sphere of work and in instructing other individuals who are connected with the care and custody of Factory Stores, so that this knowledge communicated by the I.S.S.P.O. may be transmitted to every person concerned in any way v/ith the transit and storage of materials. Each Factory should arrange for a series of lectures and practical demonstrations to be given by their appropriate I.S.S.P.O. trained individuals. Consciousness of the need for stores preservation should be instilled through notice boards and posters, prominently displayed in places most suited to each, drawing attention to pertinent recommendations.

(b) The setup of the stores preservation work, General Orders and Specific Instructions should be published by each factory in Factory Orders. Standing Instructions and Section Orders as necessary.

Quarterly damage value report s:

(a) Quarterly reports of .losses due to biological and non-biological agents and deterioration of stores should be submitted by factories in Form IAFZ 2071 to the respective Command Headquarters under the following classifications;

i) Rusting of ferrous materials

ii) Corrosion of non-ferrous matericis

iii) Chemical deterioration/change caused by exposure to weather, light, heat, etc.

iv) Aging, expiry of shelf life & other causes not covered by (i). lit) & (iii) above.

(b) The Reports should be prepared by Factories, in triplicate the Original to reach the Senior Scientific Officer, J.S.S.P.O. at the respective Command Headquarters and the duplicate to DGOF before the 5th of the month following the quarter under review. The following additional information should invariably be furnished:

i) Losses which take place in the stock declared to DGS&D (To be reported separately)

ii) Total losses connected with care and preservation work.

iii) Date of receipt of stores in which the loss is involved and the condition of storage (also whether adverse storage condition was inescapable). .

iv) Losses on account . of the stores being rendered unserviceable from a serviceable condition and due to changes in condition from repairable to unserviceable.

v) Any other relevant remarks.

Monthly Progress Reports;

Monthly reports showing the details of treatment given to various stores during a particular month prepared by Factories in triplicate on Form IAFZ original to reach the Senior Scientific Officer, ISSPO at the respective Command Headquarters and the duplicate to DGOF before the 5th of the month following the month under review.

Report on receipt/despatch of Stores in deterioration condition etc:

Report on Form IAFZ-2070 should be prepared in triplicate in respect of store Infested or otherwise deteriorated or .in improperly preserved condition in accordance with the instructions given on the reverse of the Form. The original being forwarded to the Senior Scientific Officer at the respective Command Headquarters and the duplicate to the DGOF.

Provi sion of materials and Equipment:

(a) Lists of materials and equipment required in connection with the care and preservation of stores prepared by the I.S.S.P.O. will be circulated to Factories by the DGOF. These are classified as follows:

i) Ordnance origin - No forecast will be submitted to the DOS. Stores, should be obtained from the depots by placing indents as and when required.

ii) ASC supply - Forecasts will be submitted by Factories to reach the DGOF by August every year. The consolidated forecast will be forwarded by the DGOF to the Director of Supply & Transport, New Delhi latter obtaining financial, concurrence/ by the 15th October each year • -for provisioning arrangements. Indents;, should be ^placed by factories on the ASC depots as soon as it is confirmed by the D of S & T to the DGOF that the material are ready for supply.

iii) Supply of' Medical- Stores and Equipments

Forecasts will be submitted by Factoriess so as to reach the DGOF by October each year. .The consolidated forecast will. Be submitted by the ' DG "(after obtaining financial concurrence/.to the'DGAFMS, New Delhi, by the 15th December each year. Indents should be placed by Factories on DGAFMS depots as soon as it is confirmed by the DGAFMS to the DGOF that materials are ready for supply.

iv) Trade supply - Stores not available from the above sources or which cannot bs manufactured by factories should be obtained by Local purchase or the central purchase depending on the cost.

b) All forecasts should be supported by a Stock Position Statement. Copies of consolidated forecasts will be endorsed to Factories concerned. Before placiny Indents (9 copies of each) on the depots. Factories should obtain confirmation from the DGOF about the possibility of supply by the depots.

OBSOLESCENCE AND DETERIORAT10N.

1.DEFINITIONS:

Obsolescent: An item is said to be obsolescent when it is going out of use but is not yet completely unusable. For example, let us suppose that a transport firm has been running lorries of model XYZ, and it is decided that in future ail replacement vehicles are to be model ABC from a different manufacturer. From the date when this change is announced most of the spare parts in stock for model XYZ become obsolescent. This does not mean they are immediately worthless, because they can be used for repairing the lorries to which they belong as long as these models are in service. On the other hand. the number of XYZ lorries maintained will decline as time goes on, and they v/ill all eventually be disposed of. It is extremely unlikely that the spares in stock will be used to the very last item and there is an expectation that some of them will be on hand when all the XYZ lorries are withdrawn. Therefore, there is a likelihood of less by virtue of the fact that these remaining spares will have to be sold and probably fetch only scrap value.

Obsolete : An item is regarded as obsolete when it is no longer usable by the business concerned, because of a change in operational practice or production methods. For instance, in ills example quoted above, when all the XYZ lorries have disappeared, the XYZ spares will no longer be obsolescent, but. obsolete

Surplus: When the quantity of an item in stock is more than is reasonably necessary to provide an adequate service to the production or operational activity, the excess over the normal holding is said to be surplus. This has the same meaning as redundant. For example, if the use of 6 mm, twist drills in a factory is running at the rate of 50% and there are 6.000 in stock, there is obviously some surplus, because the stock would last for 10 years. Surplus stock may arises a result of changes in production or operational methods, or may be due to mistakes or inefficiency in stock control or purchasing.

2. HOW OBSOLETE AND SURPLUS STOCKS ARISE: Such stocks can arise from\various factors:

A change in the design of the equipment. Change in the method of manufacture. Unforeseen reduction in the volume of production Change of the product itself i.e. where it has been decided to do away with the manufacture of the particular product itself or irake such drastic chances in its shape, size or qualities that make it quite different from the old product.

In the case of spare parts of existing equipment it cash arise when it has been decided to phase out or sell of the old equipment and buy a new model. Some wrong decision on the part of Management. These dormant stock must be put to some other use or disposed of promptly if a company is to realise its maximum profit.

Surplus and obsolete stock consist of raw materials, replacement parts, and maintenance and operating supplies .

3. IDENTIFYING SURPLUS AND OBSOLETE STOCKS:

Surplus and obsolete stocks a re usually identified from stock records. This can be done by making age and consumption analysis. This is a simple statement showing the stock held and issues made during the last few years, say 5 years. If 2000 numbers are in stock and only, 6, 14, 21, 30, 35 have bee issued during the last 5 years, it will reveal a case of sur^-xiis stocking. If no issues have been made at of the items for the pst, say 3* years, it is a case of moving item. Such,an analysis will throw up cases of moving and non-moving items from v/hich one can identify surplus and obsolete stocks. From such an analysis also know the time for v/hich the stocks have been storage.

Before the review beings, the stores officer responsible should find out what recent changes there have been in,-production or operation and what changes . From this information he will be able to deferment what major items of materials or spares are likely to become obsolete and surplus, and these can have special attention during the review. In addition, all slow-moving stock should be particularly examined to make sure whether it is still required or not .

Preliminary List of Obsolescence and Surplus:

The result of detailed examination of the stock records is to produce a preliminary list of items which appear to be obsolescent, obsolete or surplus. The next step is to investigate these items on the following lines –

i. Obsolescent: For machinery or equipment spares, make a fairly generous estimate of the probable usage of each item upto the time when it is expected to become obsolete. Submit the balance for disposal immediately, because the sooner they are sold, the more likely they are to fetch a price better than scrap value. In the case of raw materials consult the production department with a view to using as many items for alternative purposes as it is economical to do so.

ii. Obsolet List for disposal without further inquiry.

iii . Surplus: With the co-operation of the operatiny department first scrutinise these items to see if they can be put to alternative uses and , i f not, to agree what proportion of the stock is to be retained.

iv. Slow-moving Stock: Give special attention to items where there has been no movement for one year or more.

With the assistance of the maintenance or user departments, "stand-by" spares for machinery or equipment still currently in operation should be identified and the record care ndorsed accordingly, if this has not already been done in previous year. For all other sl ow- moving-it ems, the u->^» departments can advise v/h ether they wish the , stock-still to be retained and, [t] if so, why. In this category it **is** v/eil to be conservative and, after all, tne investigations have been made, it is a matte'r of judgment as to how much is disposed of immediately. It may be thought prudent even to wait until some slow-moving items have appeared on the list for two or more successive years before finally disposing of them.

Final List of Obsolescence and Surplus:

When the preliminary list has been investigated as described above, a final list should be made showing particulars of all items which it is proposed to write down or write off. In some organizations a committee consisting of representatives of purchasing and stores, finance and user departments is set up to agree the final list, which is

Inventory Control

Why Inventory Control:

The dictionary meaning of the 'term 'inventory' is "stock of goods". These may be mean for manufacture or for sale- Inventories are a modern phenomena and at any rate did not appear to have the importance attached to them in the past as new.

Inventory Control has been introduced as modern technique of management for monitoring continuous control on the inventories held by an organisation. This system carries out monitoring on " actual utilization and stock of inventories which is different from other functions of Material Management" like planning, procurement etc. where the actions are taken based on certain anticipated programmes/requirement. Hence.it exercises control on material planning, procurement, storage and disposal and gives necessary feed back. information for taking corrective action from time to time.The cost involved in keeping goods in stock is the important factor in inventory management. In India itvaries from 25% to 33% per annum. *In* other words, if a company has 10 lakhs worth of goods in stock, it *incures* an expenditure of say.-Rs. 2.5 lakhs every year, just to hold these stocks in its warehouse. A Estimates of inventory holding in India in all the sector put. together, i.e. Government, Public, Private are of the order of Rs.1800 crores. Assuming an inventory carrying cost of 25%. per annum, it amounts to Rs. 4.5 crores *per annum* In other words, this fantastic amount of money, is Just used to maintain the ideal capital. It, therefore, stands to reason that controlling its materials held in stock is vital -or the survival of a company. Hence the importance of inventory control.

The term, inventory control relates to a set of policies and procedures by which an organisation determines which materials it will hold in stock .and Qty. of each that it will carry- Inventory control means the same as stock control although some people make distinction by including work in progress in inventory while using the term stock to refer only to the goods in the stores. Actually the Americans usually prefer inventory control while the British favor the term stock control Both mean the same thing.

ADVANTAGES OF INVENTORY CONTROL:

The benefits of inventories can be best understood, *if* one imagines of an organisation working on No inventories at all. The organisation, on receiving a sales order, would have to order out the quantity of materials required for completing this order, wait till these arrive and then start "production. One can think of the various disadvantages of this way of functioning viz:

1) Customer have to wait too long for the delivery.

2) The materials may have to be brought at high prices.

3) The production cost will be high.

4) In the case of rejection, long waiting would bs inevitable to get fresh supplies.

In short, such a company would not be able to provide a satisfactory customer service and would not stand long in competition both in the matter of price and customer service-Introduction of a proper inventory control system has been keeping the investment in the inventories as low as possible yet (a) ensure availability of materials by providing adequate protection (b) Allow as full advantage of economies of bulk purchases and transportation

DISADVANTAGES OF EXCESS INVENTORY:.

More inventories look-up capital of an enterprise, which could be invested in certain more profitable operations Besides, maintenance of inventories also costs money by way of expense on stores i.e.stores space equipment and personnel, insurance, taxes pilferage etc. obviously more the inventories are hence undesirable.

PURPOSES OF INVENTORY ARE:

The purposes for which inventory is created are protection and economy.

(i) To provide sufficient material to meet demands for the particular raw materials, fabricated part, or finished product, with minimum delay. (i.e. protection).

(ii) To effect lower- product costs by realizing the- economies resulting from longer manufacturing runs and from purchasing larger quantities on order (i.e. economy)

OBJECTIVES OF INVENTORY. CONTROL:

The objectives of inventory control are as-under:

i) To reduce the cost of inventories to the lowest possible level.

ii) To avoid loss/stoppage of production due to stock out.

iii) To ensure production and supply of items at the planned rate.

iv) To introduce the scientific method of accounting of inventories so that computerized methods of inventory control can be introduced. For this purpose codification, of materials is carried out**.**

v)To carry out standardization of the items.
vi) To carry out variety reduction of items.

vii) To identify items which need more effective control as compared to ether items cue to various reasons to make it possible for the management to monitor, control since smaller is the number of items, to be controlled, more attention can be paid.

viii) To minimize indirect expenses associated with the inventory by effectively utilizing personnel, storage facilities, material handling equipments etc.

ix) To help organisation in laying down policy for different review period of the items belonging to different categories of importance.

CATEGORIES OF INVENTORY:

In manufacturing concern inventories usually fall into four broad categories;

i) Production inventories: These are two varieties

(a) Materials which are purchased from. The marKet, like raw material s and ready made parts and components required for manufacture of an equipment- .For example a car manufacturer buys tyres, batteries, etc. which he fits into the car.

(b) Special parts or components manufactured in one's own company and'kept in stock forjuse in manufacture.

ii) MRO inventories *or* maintenance repairs and operating supplies:

These are materials purchased -from vendors and required -*for* maintenance of the production process. These do not form part of the finished production. These also include petrol, oil and lubricants (POL) machine repair parts, jigs, tools etc-

iii) Work in Progress or in process inventories:

These are semi finished products in various stages of production on the factory floor.

iv) Finished goods inventories;

These consist of manufactured goods Kept in warehouse or retail outlets and meant for sales.

FUNCTIONS OF INVENTORY:

There are five basic functions which inventory serves. These functions must be understood if inventory is to be analysed to determine how much inventory is really required. These functions are:

i) The lot size inventory:

Most companies manufacture items in lots rather than at exactly the rate they are-used- The main reason relates to production costs and effeciency As a result of this; inventory in excess of immediate requirements will be carried.

ii) Fluctuation inventory:

These inventories exist because demand or supply fluctuates. Safety stock is fluctuation inventory.

iii) Anticipation inventory:

.These are the inventories that are-built in anticipation of future demand. Anticipation inventory might take the form of an inventory builder during a slack season to keep the labour employed while providing for demand during the peak season. Inveontory build ups a head of the holiday season or to anticipates strikes or to provide initial inventories f new products and self promotion items are also anticipation inventories.

TRANSPORTATION INVENTORIES :

These inventories exists because materials are moves from place to place. A company is a plant in Nasik and stock points at Bombay, Kolkatta, Nagpur, Chennai etc.would normally have considerable ampount of inventory in transit between the plant & sytock point wearhouses. It is the typical time for rail shipment across the country were two weeks among the average, there will be two weeks supply of inventories in transit.

To ensure against delays in deliveries. When a order for fresh stock is made, it takes some time for the supplies to reach the ordering party. Replenishment time between a time of placing the order & the time of stock arrival is often subject to variations depending on the market condition. A manufacturing concerned must hence hold some reserved stock to allow production continue it delay in procurement occurs.

SELECTIVE INVENTORY CONTROL:

As its name implies, selective control means *:That-.* we have variations in. the method of inventory 'control *from* item to item and this differentiation should be on a selective basis. Very broadly, selective control can be divided into eight types. These are:-

The technique of ABC analysis is a basic technique of inventory control. & is often said

Sl. No	Classification	Basis	Main Use
1.	ABC (Always Better Control)	Annual Value of consumption.	To control Raw Material, Work in progress inventory.
2.	HMHML (High,Medium,Low)	Unit price of material.	To cost of purchase.
3.	XYZ	Value of items in storage.	To review inventories & their use as scheduled intervals.
4.	VED(Vital,Essential,Desirable)	Criticality of the component.	To determine the stocking level of spare parts.
5.	FSN(Fast,Slow,Non Moving)	Consumption pattern of components.	To control obsolence.
6.	SDE(Scare,Difficult & Easy)	Problem faced in procurement.	Lead time analysis & purchasing strategies.
7.	GOLF (Govt, Ordionary, Local, Foreign)	Source supply of material	Procurement strategies.
8.	SOS (Seasonal, off seasonal)	Nature of supply.	Procurement/Holding for seasonal items, agricultural products.

A,B,C CLASSIFICATION :-

ABC analysis can be applied to all most all aspects of the material management. Such as purchasing, receiving, inspection, store keeping & issue of stores, verification of bills, invenoty control value analysis etc.If we make analysis of all store items representing the entire inventory in terms of the annual consumption of each in rupees ti will be found that not more than 18% of the items will be responsible for about 70 percent of the total annual consumption cost, about 20% of the items will be account for about 20% of the annual consumption cost, while the balance 70% of the items will cover only 10% of the cost. The small number of high consumption value items are called `A' items, the medium consumption value items are `B' items, while the large number of items whose annual consumption value is very low are `C' items.

CONTROL FOR A, B AND C ITEMS:

In controlling A B & C items there are two basic requirements.

a) To keep the capital tied-up in the inventories as low as possible-

b) To make sure that all the materials would be available when required for consumption.

POLICIES OF A ITEMS: (Less than 10 percent items. More than 70 percent value)-

1) These should be ordered more frequently to reduce the capital looked up in inventories.

2) Annual or 6 monthly contracts with staggered deliveries should be preferred

3) Develop & raise more often ordering quantities, recorded points and safety stocks.

4) As far as possible two or more suppliers should be sought for each item.

5) Purchase of 'A.' items should be looked into by the top executives.

6) Review once in a month.

7) Stock and issue records should be meticulously maintained-

POLICIES FOR `B' ITEMS: (Less than 20% items about equal percentage value).

1) Order quantities, reorder points and safety stocks should be Fixed,

2) Annual or 6 monthly contracts with scheduled deliveries can be used to an dvantage

3) Stock and issue records are necessary to be maintained.

4) Review once in 3 months-

POLICIES FOR C ITEMS: (Over 70% items less than 10% value).

1) Stock to last & months to one year can be kept in stock.

2) Items should be grouped and one group o-f item. should be ordered at one time.

3) Annual or 6 monthly orders should be placed.

4) Review ones in 6 months or one year.

5) Authority of the purchase *of 'C'* items. should be delegated to junior Executives.

V E D CLASSIFICATION:

VED stand's for Vital, Essential and Desirable. This type of classification is applicable mostly in the case *of* spare parts. The peculiarity about spare parts is that it does not follow predictable demand pattern as in the case of raw materials *-for* example. The result is that if we follow the usual methods outlined earlier, we might get into difficulties when the demand suddenly chances.. For example, the older the machine gets the greater may be the maintenance spares required. As such, past trends cannot throw much light on stocking policies. To get over this difficulty, V E D classification is used. Here,the categorization is made in terms of the importance or criticality of the part to the operation *of* the plant. If it is very vital, it is given a 'V' classification. How such a classification is done will purely depend upon the machinery or equipment involved and one's own experience, ease of availability of the items etc. For example if the item was available off the shelf from the supplier's stock room, there Mould be no purpose in categorizing it as 'V- If on the other hand, a minor imported item might automatically get a 'V classification. In other words the classification is not purely in terms of the criticality of the item for proper working of the machine but it is a combination of several factors including price etc.

H M L CLASSIFICATION:

More or less the same procedure as for A B C classification can be adopted where the only difference being that unit value is the the criterion & not the annual consumptions value. The items should be listed out in descending order of unit value, & management may fix limits for deciding the three categories. For example, it may decide that all items of the unit value above Rs.5000/- will be`H` items between Rs. 1000 to 5000 will be M` items & below Rs.1000/ will be `L` items. On this basis management may delegate authorities to various subordinate officers to purchase petty cash items. A Top management may decide that items of the value above a unit value of Rs.5000/- are `H` items & may decide that all such items will only be sanctioned by it.

S D E CLASSIFICATION:

These letter stand for Scare, Difficult and Easy to obtain . It is quite obvious that where an item is scare and it is a 'A' item, we can not apply the same procedure or yardstick for its stocking. Take for example, an item which is imported, it would be quite absurd for any one to say that it should be procured once in six weeks. It would be best to obtain it once in a year, considering the time effort and expenditure involved in the importation.

A scarce item might be an item which is not easily available in the market and might require source development, or else it might *be* an item which is very

difficult to manufacture or there are only one or two manufacturers, who have yet to be given orders that too several months in advance. .

GOLF CLASSIFICATION :-

The word stands for Government- Ordinary- Local- Foreign. There are many items of import, which are canalized through the State Trading Corporation, Indian Minerals and Drugs and pharmaceutical Ltd. Metals Trading Corporation etc. There are special procedures to be followed for procuring such items. As such ordinary procedures of inventory control may not work in respect of these materials and they would require special treatment.

Similarly, the items which are available within the country would be treated differently if they were available locally, compared to them being available only. distant towns or where they achieve to be specially procured. Imported items would be a special class by themselves and have to be accorded a treatment quite unique.

FSN CLASSIFICATION:

This classification takes into account the pattern of issues from stores. The three letters stand for fast moving, slow moving and non-moving. This classification comes in very handy when we desire to control obsolescence. Items classified as 'S' and 'N' required very great attention, especially N items- There may be several reasons why an item has got the N category. There might have been a change in technology or change in the specification of a particular spare part or the item might no longer be in use. When an FSN classification is made, all such information stand out prominently enabling managers to act on to information in the best interests of the organisation.

SOS CLASSIFICATION

Some of the items required are seasonal in nature and. require special purchasing and stocking strategies. Many commodities especially of agricultural origin and seasonal in character have to be purchased at the best time. One cannot apply E.O.Q. here for example- Inventories at the point of procurement will be extremely high, but this can not be helped.

XYZ CLASSIFICATION:

This is the last type and based on the value of inventories store. If the. values are high, special efforts should be made to reduce then. This exercise can be done once in a year.

`X` items are those whose inventory values are high, while 'y' are medium value items, while `z` items are low value items. Such type of classification helps us to identify those Items, which are extensively stocked.

CARRIAGE BY RAIL/ROAD/AIR & CLAIMS.

CARRIAGE *BY* RAILWAYS

The responsibility of the Riv. administration as carrier is laid down in the Railway's Act. Some of the important provisions are as under :-

(a.) Railway administration functions as bailee as per the contract Act for loss. destruction- damage, deterioration or non-delivery of goods carrid by Rlys. within the period of seven days after the termination of the transit (This rule does not apply in me case of goods carried a: owner's risk rares. certain valuable and other specific goods).

(*b)* Railways are generally responsible for transit loss except caused by the following :-

1. ACT of God 2. Act of War 3. Act of Public enemy
4. Arrests restrained or seizure under legal process.
5. Order or restrictions imposed by the Central Govt.
6. Act of omission or negligence on the par! Of the consignor or the consignee or their agent or servant.
7. Natural deterioration or wastage in bulk or weight due ro inherent defect, quality or vice of the goods. Time limit for submission of claims to the DOSW London.

i) For shortages, damages etc. 6 months from the date of sailing of Ac vessel.

u)For defects and faults in material workmanship, manufacture etc As per terms of the contract including warranty.

LIMIT UP TO WHICH CLAIMS CAN BE WAIVED

The discrepancies will be considered as trivial and need not be perused, if the total value docs not exceed 15 dollars in the case of imports through India Supply Mission, Washington and 5 in respect of stores imported through DGSW, London. However, claims for me loss of vital components, which are quite essential for the running of A/C, entire machinery/instruments, should always be preferred irrespective of the value involved.

CLAIM AGAINST THE PORT TRUST-

The Embarkation Commandant at ports are also responsible for preferring claims against me Port Trust Authorities on account of stores "landed but missing or found damaged" while in their custody. In cases of claims for stores "landed but missing", wharfage charges and customs duty will invariably be added to the value of claim in addition to other charges, while m respect of damages', customs duty only

will be added.

- where goods have been dispatched with raise description which has caused loss/damage.
- where the consignee or the consignor or rheir agents have practised any fraud.
- where damage has been caused by improper loading or unloading by the consignor or the consignee cr their agent s or by riot, civil commotion- strike, lockout, stoppage or restraint of labour from whatever cause, partial or general.
- for any indirect or consequential damages or for loss of a particular market.

Every consignor of goods must execute of Forwarding Note in the. prescribed form (there are four different types of Notes) Each Forwarding note contains (a) pam'cLUars of goods carried and (b) the Terms of carriage including a statement ,of the extent of the liability of the Riy. administration for loss or damage. If goods carried at owner's risk rare are damaged, the Riy. administration is bound only to disclose how the consignment was dealt with *(* wiring carriage. Where from the disclosure, it cannot be inferred that there was negligence of misconduct, the burden of proof for negligence ere. devolves on the consignor.

Rly. administration is responsible for damages by delay or detention unless it process that the delay or detention arise without negligence or misconduct on its part or any of its servants.

CERTAIN TERMS RELEVANT TO CARRLAGE BY SEA BILL OF LADING

Clean Bill of Lading

When it is stated in the Bill of Lading that all goods are in good *order &* condition. the bill is said to be a Clean bill of Lading. When a clean bill of lading has been issued, the ship-owner is stopped from claming later on that The goods were in a bad condition.

DEMURRAGE

If loading and unloading not completed within me period agreed upon the carrier is entitled for damages. Such damages are called Demurrage. Demurrage is calculated upon the number of days ihesrup is detained beyond the agreed period. Railways in India charge demurrage if the goods are not loaded or unloaded within the rime mentioned m the Railway Receipt.

FOB CONTRACT

It means Free on Board of a Ship. Under these terms the suppliers liability comes to an end except for Transit loss or damage which may be proved to be due to improper or inadequate packing.

C.LF. CONTRACT

It means costs, insurance and freight contract. C£F contract is one

in which tile seller agree to sail the goods to be carried by sea at a price which will cover cost of the goods, insurance and freight charges.

Preferment of claims —

(a) All damaged packages will be segregated for inspection and checked by a Gazetted Officer. In cases which are important or shown very unusual features, by a Committee or Board consisting of a Gazetted *Officer* and one or more other individuals.

(b) In case of deficiency in receipts, me packing cases with their notes and wrappers will be retained until such time as me discrepancy is settled,

(c) The Gazetted Officer/Committee/Board will record to me best of their ability me apparent cause of discrepancy and record it on the Material Inward Slip. Such entries on th MI Slip will be quite dear and it will be recorded whether a claim on me consignor or me Railway can be made or not In border-line or in very difficult cases, the decision on this point win be mat of me G.M. The principle for fixing responsibility for transit losses will be as under

(i) In case of contracts stipulating delivery F.O.R. Station of destination ;- The contractor is liable in such cases for any loss or damage mat *may* occur in transit and to make good me same by replacement free of charges at destination or accept deduction from his bill for me quantity lost or damaged in transit.

(ii) in the case of contracts stipulating delivery - F.O.R. Station of despatch:

(a) In case where me contractor has agreed to me condition that they win be responsible until me stores passes contracted for are received in good condition at the destination, the responsibility is the same as in (i) above, (b) m other cases is where transit risk has not been accepted by the contractor, property in the goods to the consignee as soon as the same is accepted by me Railway Administration for carriage, me Rly. acting as a baibe. Thereafter the contractor is not ordinarily responsible for any loss or damage to the goods that may occur en route, if he has bcsn able to book the goods in & rail-worthy condition under a clear receipt without any adverse remarks as to the condition of the goods or the packing.

In cases, however, where goods are sent under a "said to contain" receipt the supplier should not be absolved of his responsibility for loss in transit unless he is able to prove beyond doubt that he was not responsible. Each case should, therefore, be examined on its merits.

In case of(i) F.O.R. destination contracts and (ii) also F.O.R-Station of despatch contracts where *the* suppliers have accepted the transit risk as per (ii) (a) above, the consignee will merely Lodge the claims with the carrier and report the feet to the suppliers. Thereafter, it will be for the suppliers to pursue die claims with me Rlys. and settle the matter.

(d) Before coming to a decision to prefer a claim on the Railway the following points will also be considered :-

(i) Military stores are despatched at concessional rate of freight under Military Credit Note at owner's risk in terms of Risk Note which states that me Railway will be free from all responsibility for any loss. destination, deterioration or damage arising from is conduct on the part of me Railway Administration or its servants provided mat in the following cases:-

1. Non-delivery of the whole of me said consignment or of the whole of one or more package forming part of me said consignment packed in accordance will the instructions laid down in the tariff or where are no such , protected otherwise then by paper or other packing readily removable by bondmaid fully addressed where such delivery is not duo to accidents to trains or due to fife.

2. Pilferage from packages or packages forming part of the said consignment property packed as in (i) when such pilferage is pointed out to the servants of the Railway Administration on or before delivery.

(ii) The Railway Administration will be bound to disclose to the consignor or (he consignee how the consignment was dealt with throughout the time it was in its possession or control and. if necessary to give evidence thereof, before the consignor/consignee is called upon to prove misconduct, but, if misconduct on the part of the consignee is called upon to prove misconduct, but, if misconduct on the part of the Railway Administration or its servants cannot be fairly inferred *from* such evidence, the burden of proving such misconduct will lie upon the consignor/consignee. It should be noted that "misconduct" and not "'negligence' has to be proved.

(c) Claims on Suppliers ~ (i) If it is decided that a claim on the supplier can be made, brief reasons for the decision will be recorded and action taken immediately. In the case of losses during transit, immediate action should be taken to establish whether the supplier is responsible in any way for me loss. Suppliers cannot normally be held responsible for losses during transit unless the Railway Receipt is qualified with a remark such as (1) "defective packing" 2) '"said to contain", (3) "senders weight accepted", or negligence in packing can fairly be attributed to the supplier.

(ii) If it is finally decided that the supplier will make good the deficiency at his expenses, the stores received in replacement of those lost or damaged will be accounted for by the Accounts Officer as " Miscellaneous receipt"

(iii) If the supplier is a Govt Department the discrepancy will be brought to nonce on die Receipted copy of the Consignor's Issue Voucher which win be returned to the supplier and in the case of supplies from Defence Establishment accompanied by a Discrepancy Report on the prescribed form. If the discrepancy is not accepted by the supplier, it will be reported to DGOF for decision. Such reports will be accompanied by 3 copies of importent correspondence together with the relevant loss statement, in quadruplicate, and will be routed through the Accounts Officer to the DGOF for a decision.

(f) Claims on Railways - i) If it is decided that a claim on the Railway can be made, this should be recorded with adequate reasons and the claim preferred immediately.

(ii) In. all cases formal claims must received by the Railway within six months from me date of me Railway Receipt They must include me required particulars and be addressed to me prescribed Railway Authority and arrangements made **to** secure proof of delivery.

(iii) If on some later date me full consignment or a portion thereof is delivered by the Railway, me stores will be accounted for by me Accounts Officer as '"Miscellaneous Receipts', being brought on charge by the Factory by M.I. Slips as certificate Receipt Voucher under R-A. I. Instruction 913. In such cases the claims on .he Railway should normally be withdrawn and me net loss, if any, written off under normal rules. If, however, it is considered mat a modified claim can be established on me Railway, me original claim should be modified and pursued to finality.

(iv) Where iron and steel structural viz. angles. Bars, channels, joists (R-S.) poles, rods, stay rods and tees are booked in wagon loads and loaded in open wagons under special packing conditions as prescribed by the Ministry of Railway (R.B.), claims of losses or shortage occurring en-route should be preferred by the consignees on the Railway Authorities in me following cases irrespective whether me materials were booked under a said to contain Railway Receipt, or under a 'dear Railway Receipt, except in cases where the loss or shortage was due to an act of God, civil emotion etc. over which me Railways have no control ;-

1) In respect of despatches in covered wagon the 'seals' are found broken at the destination station.

"The consignee factory on receipt of the Anticipated out-turn Report from the Tending Officer will forward die "Retention" copy of the Packing Account to the OFB, Calcutta for issue of Disposal order and return."

(c) Clearance against Bill of Lading — The Embarkation Commandant on receipt of the stamped and negotiable copy of the original bill of lading will surrender it» duly signed, to the Steamer Agents and obtain the delivery Order for the goods.

Note - In case the Bin of Lading is in favour of the Consignee or any other authority, it will be ensured by such authority that it is endorsed in favour of the Landing Officer concerned and sent to him immediately on receipt to enable him to obtain me delivery order from me steamer Agents.)

(d) Clearance against Indemnity Bond - Where the relative Bill of Lading is not received in time, the Embarkation authorities will prepare an "Indemnity Bond letter of Guarantee" on me authority of Packing Accounts/Invoice received and obtain the delivery Order from the Steamer Agents. On receipt of me bill of Lading subsequently it will be surrender to the Steamer Agents and the "Indemnity Bond"/Letter of Guarantee" redeemed.

(e) Clearance from me Customs — After me delivery is obtained, Customs Bill of Entry, completed in all respects will be submitted by the Embarkation authorities in the Customs to effect clearance of the stores through the Port 'Ernst

(f) Clearance from me Port Trust -- Tort Trust Chappa' or Wharfage Bill of Entry will be prepared and submitted by me Landing Officer to me Port authorities for affecting the delivery of the goods.

Survey of cargoes landed damaged - As soon as the packages are landed, mcy will be checked up with the remarks list of the Port Trust and application win be made to me Steamer Agents to arrange survey of the

2) In respect of dispatches in all types of open wagons when the 'lead seals' of Ac packages dispatched in an open wagon under "special packing condition" are found broken at the destination station and/or the binding wires on structural are out or broken and the contents of the open wagon are disturbed.

(g) Assistance by DGOF - In the event of any claim on the Railways not being brought to a satisfactory conclusion within 6 months from the date of preferment, the case will be reported to DGOF. All such reports will be accompanied by a dear resume of the case and three copies of all important correspondence including the actual claim.

NOTE - Copies of routine correspondence issued by Factories in the ordinary course of pursuing such claims are not required by DGOF.

DESPATCH BY ROAD

The procedure for Rfy consignments will be adopted mutatis mutandis and all deficiencies/defects/damages dearly recorded and noted down m me Challan/Delivery Note accompanying the consignment. Claims shoi ; lodged with me carrier or the supplier, as found appropriate according to terms of the contract(s).

DESPATCH BY SEA

Such consignments are cleared at the port of embarkation by the concerned Bmbarkanon Commandant

(b) Anticipated Out-turn Report : Intimation of a shipment will be generally seat to me Embarkation authorities at ports by Bills of Lading, Packing Accounts/Invoices. On receipt of mis intimation me Embarkation authorities will prepare the Anticipated Out-tem Report which will broadly contain me particulars of me cargo expected to arrive by tile vessel and distribute to all concerned as a matter of advance information.Package(s) found damaged. Irrespective of the fact that they appear or not in the remarks list of the Port Trust Immediate attention of the Port Trust authorities will be drawn to damaged stores, which do not appear in the "remarks list. Application for survey wifl be made within 3 days of landing from the vessel

(h) Booking of goods by Railway — Stores intended for Ordnance Factories will be generally booked by Rail at a concessional Tariff Rate against Military credit Notes at owner's risk.

Despatch from me Docks by rail will commence as soon as the cargo is located in me Port Trust Sheds. Endeavors will be made to dispatch each consign*ment* as a whole, consignments covering full wagon loads will be despatched direct to the Consignees from me port. Small consignments will be sent through the

Ordnance Depots for reasons of economy in Railway freight. Ordnance Depot will receive the small consignments from the Embarkation authorities and as soon as the wagon load is completed, they will despatch them in a wagon to the consignee.

(i) Convoy Note - Is an accounting document between the forwarding authority and the consignee. Convoy Note will be issued by the forwarding authority. The distribution of mis document will be 2 copies in each wagon and one copy to consignee with the Railway receipt.If stores from more than one vessel are placed in one wagon. Convoy Notes will be prepared for stores from each vessel. The consignee factory will return one copy of me Convoy Note duly acknowledging the receipt of the stores to the Embarkation Commandant Ordnance Depot concerned within one month from the date of receipt of stores.

(j) Railway Receipt — Railway Receipt (a copy of the Invoice or Way bill) is granted after me goods are booked by me Railway Authorities and sent to the consignee with a copy of Convoy Note without delay.

(k) Wagon Despatch Signal — After the goods booked " Wagon Despatch Signal** will be issued to the Consignee Factory quoting wagon numbers, tonnage of stores dispatch. Railway receipt number and also quoting reference to the relevant item number in me Anticipated Out-turnReport

(i) Final Out-turn Report — On completion of the clearance and despatch of all consignments shipped per vessel, the Embarkation authorities at the port will prepare a Final Out-turn Report in respect of cargoes arrived by that particular vessel and distribute copies to all concerned. A copy of the Final Out-turn Report together with the returnable copy of the Packing Account with its portion "A" of page 3 duly completed will be also sent to the consignee concerned as a matter of final information regarding the disposal of me cargo arrived by the vessel

CLAIMS

(a) Claims against Steamer Agents ~

(I) Authorities responsible for such claims. The responsibility for handling claims in respect of cargoes shortlanded (i.e. actually shipped from the forwarding station but not discharged at the port of destination) or landed damaged at ports is mat of the Embarkation Commandants at ports who will deal with them from the time of initiation to the time of their final settlement

As soon as a case of shortlanding or damage to an imported cargo becomes apparent the Embarkation Commandant at once make a formal application to the shipping companies calling for the Marine Survey of me goods so as to assess me extent of loss/damage. (Marine Surveys are conducted under me authority of me carriers by approved parties who record their observations m their report to the earners. Marine surveys will be held within me stipulated time limit (generally 3 days from the date of landing of the package) and claims against the Steamer Agents will be preferred within the prescribed time-limit (generally I year from the date of landing of the cargo), with

all available supporting evidence and pursued till its final settlement or repudiation in accordance with the Provisions of Law.

A copy of the claim on account of stores shortlanded or damaged will be forwarded to the controller of defense Accounts in whose area the port is located for watching the progress of the claim. The amounts recovered from the shipping companies will be credited into the treasury on LA.F.A. 507 (Military receivable Orders) (Lid the Treasury Receipts (triplicate copies of Military Receivable Orders, duty receipted by the Bank) will be forwarded to the Controller of Defence Accounts concerned in whose area the port is located. The Army Headquarters, New Delhi in consultation with me Ministry of Law and Ministry of Finance (Defence) win decide the question whether a legal action will be taken in a case or a claim will be dropped. The losses/damages discovered at the port of landing es also information on any claims preferred on the carrying companies will be endorsed on me relevant packing Accounts by the Embarkation Commandant concerned, to be transmitted to the consignee factories.

Procedure for submission of claims for stores imported from U.K./USA and the Continent under Bill of Lading received from DGSW London/USA

According to the existing procedure claims for shortlanded or damaged stores in respect of shipments arranged by DGSW will be prefeared on the Agents of Shipping Companies in India for settlement. The following points will be carefully remembered while preferring claims against the Steamer Agents :-

i) That (he claims will be at the Invoice rate i.e. CIF cost

ii) That in case of shortages or losses in contents, claims will be lodged on the Steamer Agents irrespective of the tolerance limits prescribed for claims against the suppliers.

iii) That in case of shortages of damages to stores, proportionate customs duty will also be added.

iv) That claims will be submitted to the steamer Agents within the prescribed time- limit

CLAIMS AGAINST THB SUPPLIERS PROCEDURE **TO** BE FOLLOWED:-

To ensure that me claims against the overseas suppliers for losses or damages due to their faults do not get time-barred, the consignee factories will check up me contents of me packages immediately they are received from the post and forward at once a "discrepancy report" for shortages or damages detected to me Director General, Ordnance Factories, Calcutta with a copy to me purchasing Agency abroad DGSW London or ISM, Washington. The discrepancy report must be complete, precise and correct in all particulars viz. quantity of stores found short/damages, value involved including me estimated cost of repair if repairable at the consignee's end, and all the information that will be helpful to DGSW London to negotiate with for settlement of the claims. The reason for damage/rejection of stores, including any manufacturing defects,

will be furnished along with the condition noticed. It will also indicate whether replacement is necessary or not.While preferring claims against the suppliers the tolerance limit as prescribed by the depot of Supply will be adhered to where mere is no prima-facie evidence of defective packing on the part of the suppliers.

DEMAND NOTES & RETURN NOTES.

Thousands of materials (Raw materials for manufacture, including components or processed materials purchased in the market or received from other factories) is born on stock charge of factory stores.

All production & non production sections are demanding various types of these materials on every day. To keep record of materials being issued and keep control on materials. storeholders will not issue anymaterial for use in factory without a Material Demand Note signed by person authorized to requisition such stores. Separate material Demand Notes .will be prepared for each description of material and for each job. The JWM/In charge of section, or other person authorized on his behalf, will forward the material demand note in triplicate together with the material demand on the authority of which the materials have been requisitioned, to the storeholder / storekeeper. The. letter will enter all issues of material made by him in the Material Warrant after verifying that the quantity demanded is within the quantity authorized & will return the Material Warrant and copy of Material Demand Note with the materials to the JWM/In charge of section. The copy of Material Demand Note will be returned by the JVM/Head of Section or his representative to the Storeholder/Storekeeper, duly receipted by him or by other person authorized on his behalf. This will be passed on by the Storeholder to the Accounts Officer, after the issue has been entered in the appropriate Bin Card. The material demand Note will assigned serial number by the Storeholder.

In case of direct materials section v/i i 1 prepare demand notes as per material warrant issued to concerned section and after entry in computer storekeeper of section will take the demand notes duly signed by head of section to stores for collection alongwith the material warrant.

In case of indirect items/tools & gauges/sundry shop stores/plant stores (screw, nuts etc.)/packing materials etc. section storekeeper will take the demand notes alongwith material warrant for indirect items to concerned PV/MCO Office who will look into the stock available, quantity which can be -spared for the concerned section etc. and give availability release remarks on the demand note authorizing the section to draw the material. Section storekeeper then will go to stores section for drawal of material after entering the Demand Note/Quantity authorized in the computer. The storeholder / storekeeper may alter quantities shown on the Material Demand Notes if necessary, in order to conform to the quantity / type of stores actually issued. The will attest the correctness and enter the altered quantity only in the Material Warrant .

In factories working on the "except" system, components manufactured in the factory are drawn for the purpose of assembly on Red Material Demand Notes and the corresponding entries are made in the Material column in red ink.

No materials will be supplied or issued on loan from a factory to other Military cr Non-Military Govt . Departments except on the authority of the DGOF,

a copy of whose order will be sent to the Accounts Office. Similarly no materials will be issued on loan to Private Firms without authority of DGOF. Materials may. however, be issued from one factory to another on the authority of the General Manager of the factory endorsed on IAFO-192J. (IFD) in duplicate duly concurred by the AO of the Indenting factory, a copy of the IAFO-1921 being sent to the AO . In the case of all such (IFDs) applies, proper issue voucher will be prepared by the storeholder (in quadruplicate) who will have them priced by the Accounts.

With a view to avoiding voluminous paper work and minimising the time lag involved, in IFD Transactions Provision for common user stores for two factories. situated in the same station will be made by one factory and issues of such stores to the other factory will be made through Stock Transfer Note (STN) IAFA 2611. In such cases 5 copies of the STN are to be prepared by the demanding factory and sent to the issuing factory.

Out of these 2 copies will be returned to the consignee factory alongwith the stores (one for GM and other for AO, and o copies are retained by consignor factory (one for AO).Any defective / surplus material will be returned to the store holder accompanied by Material Return Notes (in triplicate) and the material warrant concerned. The Storeholder/Storekeeper will enter the number assigned to the Material Return Note and the stores in the material warrant and will return the Material Warrant .to the SK of concerned section and pass on receipted copy of Material Return Note to the AO.

The storeholder may, if necessary alter the quantities shown on the Material Return Kotes provided the quantity actually received is less then the quantity noted on the Return Note, he will attest the correction and enter the altered quantity in the Material Warrants. Defective Material will be entered on separate Bin Cards and kept distinct in the priced Store Ledgers. Where necessary, materials returned to the stores will first be examined under administrative arrangements iWI or OC) for sentenciny as to the category viz. serviceable, repairable or unserviceable under which the stores will be brought on the storeholder charge. Scrap will not be allowed to accumulate in the shop. All scrap will be returned to the stores with Material Return Notes in triplicate accompanied by the .Material Warrant concerned in cases where the scrap can be definitely allocated to a job.

The scrap which cannot be allocated to any should be returned on WO 02/00358/00.Stores sold under the orders of Disposals Organisation are classified under the cover of Departmental Advice (or Inspection) Note (supported by a production voucher if necessary) one copy of this note signed by the storeholder will be furnished to the. AO. Store intended. for stock will be brought on to me Bin Card and the advice note or supporting production voucher allotted a stores series receipt voucher number. In case of stores manufactured for issue outside the factory regular issue voucher will be prepared.

Warrants:-Issue,Control, Closing & Linkage With Store.

Warrant: Warrant is an authority given to shops concerned for undertaking production. Of items stated in the warrant.

Warrants are of two categories: 1)Manufacturing Warrant. 2) Material Warrant.

MANUFACTURING WARRANT:

These are prepared as per slandered estimates for each item of work which contains the following informations

a) Work Order , Warrant Number & Date b) Authority for work(i.e.IFD/Extract/P.O.Etc).

b) Estimate Number.d)Drawing number. e) Nomumclature of the article to be manufactured.

f) Name of the Shop. g) Labour operations & their rates.

MATERIAL WARRANT.

These warrants are issued authorizing shops to draw materials from stores. Simultaneously with the issue of manufacturing warrant. & has same warrant number & date. This contains same information's as on manufacturing warrant, except that in this case material required are detailed with quantities instead of labour operations. Material quantities are based on slandered estimates.

PROCEDURE FOR ISSUE OF WARRANT.

Warrants are issued by Warrant Office to shops based on requisitions from concerned planning groups or office. Warrants are prepared on computer & details are recorded in warrant register like W.O.No., Warrant No., Qty. Reqd., Date of issue to sections and estimate No. Copy of the warrant are distributed to relevant sections & accounts.

Warrants are further categorised as per type of production required as under :-

i) Production Warrant. ii) Tool Warrant. iii) Quarterly Warrants. iv) Warrants for manufacture of sundry items or maintenance components of machines.

Record keeping *of.* warrants in sections and their completion and return to Warrant Office.

Each section records the details of warrant issued to it in a register. As the item against a warrant is taken up for manufacture, details are recorded on material & manufacturing warrants are as under :-

Material Warrant : Demand Notes for the material drawn & Return note number if any.

Manufacture Warrant :- Details of piece work cards for labour booking claimed, material received, dispatched to other sections for CG & rejections. Details of I/Notes raised by final section.

SYSTEM OFISSUE OF WARRANT. :- There are two systems of issue of warrant.

1) Except system. 2) Sub-Warrant system.

Except System: when seperate warrants are issued for components & sub-Asssys of a particular Assy against 40 series of work order, system is called Except System. Component are made and kept in C.G. & are drawn on assembly warrant through re-demand notes. This system is generally used for issue of Warrants where the order is bulk.

Sub-Warrant system : In this system there is only one warrant number for Assy and components of Assys. Assy will be given main warrant number and component will be numbered with a sub-warrant number i.e.

Main Warrant will-be as Sub-Warrant will be

0017513	1	000

The Sub warrant will be

0017513	1	000
0017513 1		001
		002
		003 &

This system is adopted where order is small and not of a-repetitive nature. In this system I/Mote is prepared for Main Assy Warrant only and I/Notes are not required to be prepared for components.

REJECTION :

Rejections taking place in warrants are recorded by each section on back side of manufacturing warrant and replacement orders are raised duly certified by inspection sections. When the warrants are completed these replacement orders are forwarded to Warrant Office alongwith warrants. In case of sub-warrants these replacement orders are forwarded to warrant office whenever rejections take place since replecement quantities are to be authorised on the sane warrant for taking up the manufature to complete the main Warrant (In case of except system of warrant replacement are not authorised on same warrant but the warrant is short closed. Fresh warrants are issued to cover rejections.

JUST IN TIME

JAPANESE MANUFACTURING METHODS :

AN EVALUATION OF THE JUST-IN-TIME INVENTORY SYSTEM

The Just-in-Time and Japanese management are themes which find increasing mention in our management textbooks. The Just-in-Time (JIT) concept appears to be central to Japanese, production management and in productivity improvement. "The. JIT idea is simple: produce and deliver finished goods just in time to be sold/ subassemblies just in time to be assembled into finished goods, fabricated parts just in time to go into subassemblies, and purchased materials just in time to be transformed into fabricated parts." To achieve the objective of the just in time system, the Japanese use engineering to drastically cut machine setup times so that it is economical to run very small batches. The idea is to make one piece just in time for the next operation. In management terms, the classical economic order quantity (EOQ) has been cut down to approach a Qty. of of one.

On 'first thought, this advantage seems insignificant, allowing only savings on inventory carrying cost, while producing and carrying smaller lots.But on closer examination, this practice creates a chain reaction of benefits in quality, worker motivation, and productivity, amongst other factors. Before looking further into how Just in time works and its follow-up benefits, let us consider the reason why it has been developed in Japan.

ENVIRONMENT FOR THE GENESIS OF JIT

A distinctive feature of Japan is the lack of natural resources, which makes it necessary to import vast amounts of materials. To overcome this deficiency, it is essential for Japanese industries to put forth their best efforts in order to produce better quality goods, having higher added value and a lower production cost, when compared to most developing countries. The major emphasis is to conserve resources while avoiding waste at all costs. Accordingly the practice of conservation is a significant part of Japanese culture.

In contrast to Japan, Western countries are blessed with abundant space, energy and material resources. Manufacturing companies in these countries have learned to handle consumer demand for a variety of goods, and through inventory to be responsive to changing consumer demand for products. This ability to quickly react to changing demand has sometimes been called a "waste" type strategy.

The JIT approach attempts to control such costly sources of so called "waste" as:

* Idle inventories (uses material resources un-necessarily)
* Room for idle inventories (use-limited space)
* Defective parts and products (a waste of materials and energy)

Faced with a lack of natural materials, Japan has been forced to develop the JIT approach.

THE THEORETICAL CONSIDERATIONS OF JIT

It is obvious that when we order in larger lots, the average inventory is large, and as a result one has to incur higher inventory and carrying costs. Therefore, in order to cut carrying cost, we must order in smaller quantities more often. .-But frequent ordering has its costs, too. In factories and plants, every time we manufacture a component part, there is a setup cost involved, and in ordering, -an ordering cost involved. Moving dies, trial tests, labour and personnel are a few examples of such costs. Hence, a typical trade off is that the financial people would like to hold down carrying cost to small, frequent runs; whereas, those working in the manufacturing department would like to r.inir.ise setup costs and avoid production stoppages by maintaining long production runs.

There is an economically correct, size. not so big as to incur an excessive setup or order cost. This is known as our classical Economic Order Quantity (EOQ). For years the EOQ has been cornerstone of inventory management. But the Japanese experience has provided evidence that requires us to revaluate the classical Economic Order Quantity concepts. Carrying cost and set up costs are only the real obvious costs; quality, worker motivation and responsibility and productivity should be important as in EOQ. Set . up costs are real & significant, but not unalterable. One of the benefits of minimum lot sizes has been its favourable effect on quality. This phenomenon can be simply explained. If a worker makes only one of a given number of parts and passes it to the next worker immediately/ the. first worker will hear about it soon if the part does not fit at one of. the next work stations. Thus/ defects are discovered quickly & problems rectified immediately. Further,with a minimum amount of inventory,there is less tendency to pass a defective item, or reach for next one if the present one is not acceptable.

Under western large-lot production runs, the large-lot-size inventories obscure problems caused by defective items, on the other hand Japanese production managers, under the just in time approach, use complete production line stoppages to reveal problems,, once the defective item is identified. As a result, me workers become more aware of the problems arising in the production process. Usually, the workers and their supervisors generate ideas for controlling defects and for reducing setup time which are fed back to further improve quality and reduce lot sizes. These ideas further streamline the just in time production system. A point that merits mention here is that the JIT system encourages ' workers and their supervisors to be more creative and productive.

Another drawback of the large lot size production is that it can provide an alibi for carelessness on the part of the workers. In that they m.-'y feel that a certain percentage of defective parts in a large lot would cause few problems. Under such a production system the problem of defective items is dealt with By discarding such items aside while continuing the process of assembling. By contrast, with small JIT lot sizes, a few defective parts begin to pinch richt away. It is not surprising to see workers come to one another's aid to resove problems in a JIT plant because with sroall-lot-size inventories, one worker's problem can threaten to bring subsequent operations to a halt.

Another important point relates to the treatment of safety stock by the JIT system. The safety stock principle is a simple one: The more the variation in lead time of receiving raw materials from suppliers, the larger is the safety stock. Instead of simply adding safety stock at the points of variation, Japanese production manager expose the work force to the consequences. This variation can be minimized or eliminated altogether by arranging a meeting of workers and foremen to root out the causes of these variations. For example, under the Toyota Kanban system, each time the workers succeeded in correcting the causes of recent variations in safety stock, the management further reduce the levels of safety stock repaired. Thus the workers are never allowed to settle into a comfortable pattern. On the other hand, with every unit of inventory, the interest cost of capital tied up in inventory is considerably reduced. Also, considerably less space is needed on the shop floor as "work in process" inventory is reduced; and with less inventory, the need for storerooms and warehouse space is greatly reduced. Hence, the term "stockless production" is another term for just in time production.

Let us now look at the Toyota Production System in more detail, since it provided a base for the introduction of the JIT system in the United State.

THE TOYOTA PRODUCTION SYSTEM

The elimination of wasteful practices is the basic concept of the Toyota production system. In the past, people thought upstream sections should supply downstream sections. For instance, on an-automobile assembly line, raw materials are made into parts which in turn are assembled in units, and these units flow to the final assembly line. In other words, parts progress from upstream to downstream sections and the final assembly of the mobile takes place. But Toyota looked at this production flow backwards. They examined the possibility of the downstream sections going to the upstream section to pick up the right items, at the right time, and in. the, right quantities. From' this it would follow that" the upstream sections should produce only as much as was taken from them.

As a method of coordinating a great number of sections, it would only be necessary to clearly indicate what quantity of which items would be required.

This is achieved by changing the method of transporting parts from the earlier system/ where the upstream sections sent parts to the downstream sections, to a new system where the downstream sections go to the upstream sections to pick up the right parts, at the right time and in the right quantities called the Kanban system at the Toyota Company.

Before the Kanban system is able to work efficiently and effectively, three conditions should be met. These are:

1. design of process 2. standardization of jobs 3. smoothing of production.

First, let us consider the design of processes in Toyota. A conventional worker in a traditional factory is single-function worker. But in Toyota factories, each worker is a multi-functional worker, which means, that a worker could handle several machines at the same time.

Such a multi-functional worker concept is indeed typical of Japanese manufacturing systems. In American and European companies there are several craft units in one plant a worker usually will not be permitted to operate several different machines, even at different time periods. In Japan, on the other hand, there exists only one enterprise union in each company, which. makes the mobility of a worker quite high.

The rearrangement of process leads to several benefits; (a) the unnecessary inventory between each process can be reduced; (b) the number of workers needed can be cut down, thereby increasing productivity and (c) the multi-functional worker, encourages team spirit at the shop floor.

The second prerequisite is the standardization of job. A standard operation sheet is tacked up in the factory for all workers to see. This Sheet contains the cycle of the operations, the operations routing, and the standard quantity of the work in -the production process. A cycle time is the standard specified in minuses and seconds/that each process must take in producing a product or a part. This time is computed as follows:-

$$\text{Necessary output per day} = \frac{\text{necessary output per month}}{\text{operating days per month}}$$

$$\text{Cycle time} = \frac{\text{Operating hours per day}}{\text{Necessary output per day}}$$

In turn, it must be determined how many workers are necessary for each process to produce one unit of output in a cycle time, and the workers of the entire factory must then be repositioned in order that each process will be operated by a minimum number of workers.

The operations routine indicates the sequence of operations that should be taken by a worker in each process. In other words, it shows the order in which a worker has to pick up material, put it on the machine, and detach- it after it is processed by this machine.

The standard quantity of work-in-process is the minimum quantity of work-in-process with a production line which includes the work attached to machines. Without this quantity of work, the predetermined sequence of various kinds of machines in this whole line cannot operated simultaneously. Theoretically, however, there is no need to have any inventory among the. successive processes.

The third and the most important condition is the smoothing of production. As described earlier, the subsequent processes go to the preceding processes to withdraw the necessary goods at a necessary time in the necessary quantities. Under such a production rule, if the subsequent process withdraws materials in a fluctuating manner is regard to time and quantity, then the preceding process would have to prepare as much inventory, equipment and manpower as is needed to adapt to the peak of the quantities demanded.

The variance of the quantities withdrawn by a subsequent process become larger as we 90 further back to proceeding processes. In order to prevent such large variances in all production line. (including the external subcontracted-companies, or vendors) an effort must be made to minimize the fluctions in production in the final assembly line.

After we fully implement the three conditions mentioned above, the Kanban system can be introduced.

THE KANBAN SYSTEM

The Kanban system is an information system developed to harmoniously control the production quantities in every process. At Toyota, the Kanban system is regarded as merely a subsystem of the whole Toyota production system.

A Kanban is a card usually put in a rectangular viny sack. There are two kinds of such cards that are mainly used a withdrawal Kanban and a production Kanban. A. withdrawal Kanban specifies the kind and quantity of product which the subsequent process should withdraw from the preceding process, while a production Kanban specifies the kind and quantity of the product which the preceding process must produce.

The contents of Kanban are as:

FROM	KIND OF PART	NAME OF PART	KANBAN NUMBER
TO	QUANTITY PER PARENT	BOX NUMBER	WORK STATION

The rules of the Kanban system have been framed/ in order to enable one to understand .its purpose.

RULE 1 : The subsequent process should withdraw the necessary products fron the preceding process in the necessary quantities at the necessary roint in time. Any withdrawal without a Kanban should be prohibited. A Kanban should always be attached to the physical produce.

In order to implement this rule, the to management of the company must win over all the workers and also make the critical decision to upset the previous flow of production, transport and delivery. This will probably be met with much resistance. For example, some factories in Taiwan were forced to lay off 20 to –0 percent of workers within a few months of implementation of the Kanban system because of workers resistance. Hence, implementation of this rule required courage on the part of top management, as this frequent-y necessitates a complete overhaul of the existing system

RULE 2 : The preceding process sr.suld produce its products in the quantities withdrawn ry the subsequent process. Production greater than the nu-iber of sheets cf Kanbans must be prohibited.

When this rule along with the preceding rule is followed, all production processes are combined so that they become a kind of a conveyor line. The balancing of the production timing among all processes will be maintained by strictly observing these rules. If problems occur in any of the processes, the whole process might stop, but the balance among processes is still maintained. Therefore, the Toyota production system is a structure which realizes such an idea conveyor line system, and Kanban is a means of connecting all the processes. As a result, the inventory kept by each preceding process will be minimized.

Since the subsequent process will require goods in a single unit or in a small lot size to attain smoothed production the preceding process must make frequent setup according to frequent requisitions by the subsequent process. Therefore, the preceding process should make each setup very quickly.

Rule 3 : Defective products should not be sent to the r\\ subsequent process, the Kanban system itself will be destroyed unless this rule implemented. If some defective is items are discovered by the subsequent process then the subsequent process itself makes its line stop because it does not have additional units of inventory, and therefore has to send the defects back to t-he preceding process. Such line stoppages of the subsequent process is obvious and visible to everyone. Its purpose is simply to prevent recurrence of such defects.

The meaning of defectives should be expanded to include defective operations. This means that in certain jobs standardization has not been fully attained and there exists inefficiencies in manual operations, routine and labour hours. These inefficiencies are likely .to cause the production of defective items as well.

Therefore, these defective operations must be eliminated to assure rhythmic withdrawals from the preceding processes. The standardization of jobs is, therefore, one of the prerequisites of a Kanban system.

Rule 4 ; The number of Kanbans should be minimized.

How should the number of Kanbans be determined?

At Toyota, the number is computed by the .following equation:

$$Y = \frac{DL + W}{A}$$

where, Y = number of Kanbans

D = expected demand per unit time

L = lead time (i.e. processing time + Waiting time in process and between process +conveyance time)

A = Container capacity (not more than 10% of daily demand)

W = policy variable (not more than 10% of DL)

The maximum inventor/ level (m) can be deduced by the above equation:

$$M = \frac{A \times Y}{DL + W}$$

The reduction of lead time could be achieved in each process by rearranging the layout of machinery and reducing setup time. Also, the smoothing of demand could be realized by smoother in the subsequent process.

If the lead time is relatively small and the demand per unit time also has a relatively smaller variation, then the policy variable would be smaller and so would the inventory level, resulting in this decline in the number of Kanbans.

RULE 5 : Kanban should be used only to adapt to small fluctuations in demand. An evaluation of three cases can best exemplify the above rule. The first case is where there is no change in a daily total production load, but only in the kinds of products, delivery dates and their quantities. If such a revised production schedule is made for only the final production line, then the schedules for all the preceding processes will automatically be revised by transferring-the Kanbans. In this case, the Kanban system can be considered as the most economical device for an information system, because the only function for the information staff to perform in a plant function would be simply to convey the new instructions to the final assembly line.

The second case relates to short-term, small fluctuations in a daily production load, although the monthly total load is the same. In this case, the frequency of Kanban movements will be increased or decreased. This is similar to the reorder point method of inventory control where the frequency of the reorder point, is similarly altered.

The third case is associated to seasonal changes in demand, or an increase or decrease in actual monthly demand over the predetermined load, or the preceding months load. In such a case, the number of Kanbans must be increased reduced, did at the same time, all the production lines must be rearranged. In other words, the cycle-time of each workshop must be recomputed and correspondingly the number ut workers in each process must be changed. The Kanban system is adaptable to such sudden -and large variations in demand.

After reviewing the characteristics of Kanban system, we compare it with a conventional production system as follows:

	KANBAN	CONVENTIONAL
Basic Architecture	Inflexible	Flexible
Production Runs	Small Lost	Long Runs
Inventory	Stocks Seen as Waste	Stock Adds flexibility
Information Costs	Low	High
Set-Up Times	Frequent	infrequent
Operating Control	Decentralized	Centralized

However, with all its benefits, Kanban system has certain limitations. These are:

1. Kanban is feasible in a repetitive manufacturing environment, not in process industries.

2. Kanban must be in the just-in-time system. If setup time takes hours and lot sizes-are large, then it is not feasible to use this kind of a "pull" system.

3. The parts included in the Kanban system must be used on a daily basis. A Kanban plant generally uses order parts which are frequently used, but uses the conventional reorder point of MRP for less frequently used parts.

4. Very expensive or large items should not be included in the Kanban system, for they are costly to store and carry.

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Stock Verification

For a manufacturing unit raw materials, components, spare parts etc. are very essential. Without material no manufacturing unit can run. To keep continuity of manufacturing process we must stock the materials in our stores.

Normally the material is drawn by the different user section by issuing demand notes. Also we are receiving materials from trade sources as well as other factories against IFDs. All these materials are being stored and preserved by the stores section. The stores function is one of the important functions in a factory. In the stores section even though, we will try to keep all the records accurately, sometimes due to human error or by mistake discrepancies will arise between physical stock in the stores and those indicated in the Bin Card. Discrepancies may arise due to the following reasons:-

1. Incoming material might have been taken on charge but the individual store keeper might have forgotten to enter this entry in the Bin Card.
2. Material issued but bin card not posted.
3. Issue of incorrect quantities i.e. issue of more or less quantities than what was indented.
4. Errors in quantity posting. For example 12 feet is posted as 12 yards or 639 is posted as 693.
5. Posting done on wrong Bin Card.
6. Errors in addition or subs tract! on while posting.
7. Due to evaporation etc.

In order to avoid problems arising from shortages or overages physical checking of stock or stock taking or stock verification is much essential. Apart from this objective, checking of inventories is vital from the point of accountability. For purchase of material we have invested money, hence we are supposed to safeguard the material constantly and checked and accounted properly. Apart from this "basic reasons there are various purposes which physical stock verification serves.

Some of the important ones are as follows.-

i) Verify the accuracy of the stock records.

ii) To support the value of stock shown in the balance sheet by physical verification.

iii) To disclose the possibility of fraud, theft or loss

iv) To reveal any weakness in the system for the custody and control of stock.

The size and number of surpluses and deficiencies revealed by stock taking is a good criterion of the efficiency of store keeping methods; control and procedure. Normally stock taking will be carried over not only for materials and components. The stock taking is to be carried out on all the items available inside the factory i.e. all furnitures, electric fans, tools, jigs and fixture and all the inventories. Various methods of stock taking are being adopted Some of the methods are described below:-

1. ANNUAL STOCK TAKING :

This is done only at the end of the year by closing the full factory. This method is not satisfactory. Hence this is not suitable for Ordnance Factories. However some small private factories are still adopting this method.

2. PERPETUAL INVENTORY METHOD :

This method is very important and our Ordnance Factories are adopting this method only. This system is also called rotational system of stock checking.

Our head office (Ordnance Factory Board) has set up a group in all the Ordnance Factories. This group is called stock verification group which is being controlled directly by Ordnance Factory Board.

In this system the SV group staff members will take few items each day and check the stocks. Discrepancies are recorded and immediately investigated. In this system, always all the items are -being checked at least once in a year and the important items arid 'A' category items need more frequent checking. In this system the stock verification is being done by specialized people, hence the stock verification job will be cone smoothly and systematically. One more advantage in the stock verification is that we can easily deduct the deteriorated and obsolete Stocks.

Also with the help of stock verification we can easily deduct the discrepancies and reconcile our records and this will avoid any future difficulties. In view of the above, it is very clear that stock verification is a very important function in any factory.

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DISPOSAL.

Disposal is an effective function of material management which mainly serves the following purposes :-

1. To clear up the blocked capital & obtain as much revenue as possible for more useful purposes.
2. To vacate the storage space occupied by these items so that the same can be

   Utilized for storage of other items.
3. To bring them in the area of utilization from the area of non-utilization by making them available to other organization/contractors who need them.
4. Material disposal is a reverse procedure of material provisioning. In material provisioning the aim is to regulate the supply of the material to maintain continuity of production. In disposal the aim is to get rid of unwanted material to maintain continuity of production. Thus it is oblivious that this element of material management is again having common objective of meeting the production and inventory targets.
5. Disposal is a contract to sell the unwanted goods. Hence it has the following elements :-
   (a) Sale
   (b) Purchase
   (c) Transaction of money toward the cost price.
   (d) Contract.
6. Disposal brings return of money. Waste items like used cotton waste, paper waste etc. which is dispose off by burning do not fall under the purview of material management.
7. Categorization of items for disposal : The items for disposal are normally categorised under the following heads :
   (a) Serviceable Surplus items not required by organization or in excess over the permissible stock limit.
   (b) Repairable Stores
   (c) Unserviceable items
   (d) Scrap Generated as by Production of production like brass scrap, copper Scrap, Aluminium scrap saw dust etc.
   (e) Unserviceable Plant and Machinery
   (f) Waste Products like Coal Ash, Sawdust etc.,

(G)Obsolete-store is declared obsolete due to technical insufficiency of super session due to improved equipment /stores.

(H) Obsolescent- No further provisions of such items is made due to development of successor equipment.

REVIEW OF SURPLUS ITEMS FOR DISPOSAL

Review of surplus items for disposal involves scrutiny to ascertain prospects of alternative utilization or re-utilization after carrying out certain modification/processing etc., This review is carried out in the following manner.

Within the factory: A committee is formed in the factory, which carries out review of surplus items once in every six months. This committee Is assisted by Stores Branch as well as Material Control Office. This committee tries to ascertain the area of alternative/ re-utilization of these items and declares them surplus for disposal only when no alternative utilization could be found.

Technical Team: Technical team is formed under the directives of DG of Ordnance Stores (DGOS). This team consists of the rep., of different depots/departments of Defence Organizations, OF Board and Factory concerned. They jointly review the items declared as surplus by the factory and try to explore possibility of utilization by any other Sister Factory/Military Department. Whenever no such scopeexists , the team declares them as surplus for disposal.

AGENCIES OF DISPOSAL OF ITEMS

Disposal is arranged through the following agencies

BY FACTORY

DOS &D THROUGH O.F.Board

NSIC THROUGH O.F.Board AND MINISTRY OF DEFENCE

METAL SCRAP TRADING CORPORATION, CALCUTTA

MODE OF DISPOSAL

As per existing instructions, the following modes of disposal are adopted

Issue to Sister Factories

Issue to Military Organizations, Government Depots, Public Sector Undertakings

Issue to private Contractor for the purpose of conversion into raw materials/ finished products required by the factory

Disposal by Public Auction

Disposal by Advertised Tender Enquiries

Disposals through Other Agencies like DGS&D, NSIC, MSTC.

DISPOSAL BY FACTORY GENERAL GUIDE LINES

As per instructions, priority should be given for disposal to Sister Factories. When Sister Factories does not require items, the only other modes of disposal are followed.

In case of Scrap, Waste products etc., disposal is arranged by auction if the cost is below Rs.50, OOO/-.

Disposal of NON-FERROUS Scrap as well as items costing above Rs.50,000/- is arranged only by advertised Tender Enquiry. The Items for disposal are clearly demarcated from other items to avoid mix-up/disputes at the later date .

Disposal cannot be arranged by Single Tender/ Limited Tender Enquiries or negotiations by the Factory without the specific approval of the O.F.Board.

In case of disposal by advertised Tender Enquiry, it is essential to accept the higher offer only . In case of taking any other decision sanction of O.F.Board is required.

DISPOSAL BY PUBLIC AUCTION

While Carrying out disposal by Public Auction, the following steps are taken.

FIXING OF RESERVE GUIDING PRICE:

A committee is appointed by GM in which rep., of Local Accounts is a member to fix the reserve/guiding price for auction. This committee takes into account the following factors while fixing the reserve/guiding price:

Book Value of the item

Highest bid received in the last auction if the item was put up for disposal in the past

Present condition of the item.

Present market price of the item.

GOVERNMENT AUCTIONEERS:

Auctions are arranged through Government auctioneers. For this purpose a list of Government Auctioneers is maintained by the factory, and each auctioneer is given a chance by rotation in his turn.

SUPERVISION OF AUCTION: For tills purpose, supervising officer is nomlnaled by GM, who supervises the auction on behalf of the GM and gives decision regarding acceptance/rejection of the bid on the spot and signs all documents on behalf of the GM/Government of India. Supervising officer may be authorized by the GM in writing to accept the bid upto 10% below the reserve/guiding price. However GM may accept the bid upto 20% below the reserve/guiding price.

Representative of Excise Department ,Sales Tax Authorities , Security, Inspection Department, Accounts etc., also attend auction to give suitable guidance /instructions in the matter falling under their purview.

Successful bidders are required to deposit 25% of the total value immediately to Government Auctioneers on acceptance of the bid.

Balance payment of the bid is required to be made by bidder against MRO within SIX WORKING DAYS of the auction.

Bidder is required to lift the material within 21 WORKING DAYS of the auction. This time limit can be extended before the auction with.the approval of supervising officer.

Entry of bidders is controlled by the Security. Bidders may enter the factory against the gate passes to be issued by Stores Section, on payment of Rs.25/- plus Bank Draft of Rs.2000/-. This Bank Draft is returnable after the auction.

GROUND RENT: In case of failure of the bidders to lift the material within the stipulated period he has to pay the ground rent at the rate of 2% per week of the cost of unlifted material.

BELATED PAYMENT: In case of failure of the bidder to make the payment within the stipulated period he has to pay penalty at the rate of 10% of Value per day.

DISPOSAL BY ADVERTISED TENDER ENQUIRIES

The following special instructions are followed in case of disposal of advertised tender enquiries:

Tender enquiries are issued in the prescribed proforma only.

Normally 14 days are allowed for DAVP to publish the advertisement in leading Newspapers.

Last date of issue of tender forms to the interested parties is fixed as the 44th day from the date of issue of advertisement to DAVP.

Tender forms are issued against payment of Rs.5/- through the Postal Order.

The tenders are received upto 2:30 p.m. of the 45th day of the date of issue of advertisement to DAVP and the tenders are opened on the same day at 3:00 p.m.

Only those contractors are allowed to witness the tender opening etc., who have participated in the disposal of tender enquiry.

Instructions are existing that in case of disposal the tender should be completed in all respect and it should be on the prescribed proforma.

EARNEST MONEY: The Tenderers are required to submit 5% of the total cost of their bid as EARNEST MONEY along with the quotation, in the form of Call deposit or Treasury receipt.

Late quotation in these cases are discouraged

Comparative Statements of Tenders is prepared based on the quotations received , immediately at the time of tender opening.

Decision for placement of disposal contract is required to be taken as per various rules in vogue within a period of 30 days from the date of tender opening.

The GM can only accept the highest acceptable offer. In case of taking any other decision into matter has to bo referred to OFB.

SECURITY DEPOSIT: The successful tenderer has to deposit security deposit at 10% of the total value of the contract before release of disposal contract, through Call deposit or TR. [NOTE: Complete instructions in disposal procedure are contained in OFB letter No: 212/2/MM dt. 15-06-1981.]

DISPOSAL OF FERROUS SCRAPS

As per OFB's directives issued in June 1985, disposal of ferrous scraps is arranged by Metal Scraps Trade Corporation (MSTC) Calcutta. This arrangement has been made for a period of 2 years. The contract between MSTC and OPB is subsequently extended upto 1986.

The following procedure is followed in the above case.

The factory disposes off steel scrap class 'A' and '8' only.

In case of other ferrous scraps, the value should be above Rs.50,000/-.

The type scraps with details of quantity and specification is intimated to MSTC.

Tender enquiries are issued by MSTC and CST is sent to the factory for recommendation.

Disposal contracts are concluded by MSTC based on the recommendation of the CST.

Payment towards the sale value is accepted by MSTC and they issue sale release order to the contractors for the issue of the scrap.

The factory collects sales tax and other taxes from the Contractor before issue of the scrap.

Discrepancy if any arising out of the contract is settled by MSTC.

DISPOSAL COMMITTEE

In the case of disposal, if the value of the item is very large. In order to exercise monetary Control and also to safeguard the interest of Govt. disposal committee is formed which is composed as under.

Chairman - GM/Jt.GM,

Rep.of LA0, Members:

Rep. of Stores Sec Member

Rep. of Provision Office – Member,

Rep. of Works Inspection Office - Member.

Any other member as considered necessary.

DISPOSAL COMMITTEE CARRY OUT THE FOLLOWINQ FUNCTIONS:

Scrutiny of the tender enquiry before sending to DAVP regarding terms and conditions Etc., to avoid disputes at later date.

Scrutiny of quotations received and recommending the contractor on whom disposal Contract should be placed.

Supervising progress of disposal contract and giving suitable advise to the disposal Group of Provision Office and Stores Section from time to time.

In certain cases, Disposal Implementation Committee is formed. The functions Disposal Implementation Committee is to ensure that the materials are lifted by the Contractors as per the terms of contract. This committee also settles disputes, which may arise during the execution of the contract.

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