

## **Section - 8**

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# **Stores & Materials Management**

## **Lesson 1**

### **Scope, Importance and Organisation on Indian Railways**

#### **1. Introduction**

Indian Railways is the largest fully owned government organisation with total assets of over Rs. 1,81,951 crores and total investments of over Rs. 1,76,726 crores with staff strength of 13.86 lakhs as at the end of march 2009. Its current annual gross earnings are in the order of Rs 79,837 crores. Its system extending over 64,015 Kms, ranks as the largest Railway System under single management in the world.

The Railways have been traditionally the principal mode of transportation in India. The organisation moved over 836.6 million tonnes of originating goods traffic and 6920 million passengers during 2008-2009 and the demands on the system are expected to increase further in the years to come. To meet this traffic need the system employs about 8592 locomotives of all classes (mainly diesel and electric), 49,110 passenger coaches and about 2,11,763 freight wagons, which move through about 7030 stations.

The Railways need thousands of types of materials, consumables, components, spare parts and other items of stores in order to meet the demands of its gigantic networks involving manufacture, operation and maintenance of its assets like locos, carriages and wagons, track, Over Head electric Equipment (OHE) and buildings including its vast network of Railway stations with their signalling equipment. The Indian Railway has a strong network of 230 stores depots spread across length and breadth of the country, which stock over 1.8 Lakh items. In the year 2008-2009, Railways purchased materials worth over Rs 9,533 crores for operation, repairs and maintenance alone, excluding Rs 6,602 crores spent on purchase of fuel and another Rs.10,189 crores spent on stores for manufacture of rolling stock and purchase of complete units. It means total expenditure on materials purchase, excluding cost of ballast, track related items and materials supplied by contractors for civil construction works, was Rs.27495 crores in 2008-09.

In the context of keeping the entire Railway system in good condition, so that the Railway users can get the best and reliable service, the importance of making the right materials of the right quality available to the users at the right time and place and at the right price need not be over emphasised. At the same time, it has to be kept in mind that several costs associated with the materials supply activity are likely to exceed even Rs 900 crores per annum, if proper control is not exercised on the activity. The Railways can hardly afford costs of this order, which can be minimized only by proper focus on the materials activity, and this leads to the inevitability of a proper Materials Management in the Railways.

The entire task of planning the requirements, organising the procurement and distribution of materials, co-ordinating with various agencies and controlling the inventory so as to keep

down the costs is known as the materials management.

## **2. Stores & Materials Management on Indian Railways**

Stores & Materials Management has been in existence on Railways since late fifties in some form or other with its core functions of purchasing, storekeeping, inventory control and distribution integrated under one department known as the Stores Department even prior to the fifties. However its potential to contribute to the profitability of the Railways had not been exploited by the Railways then. Consequently, prior to the sixties, the Railways used to incur heavy, but avoidable costs on account of inefficient materials management systems, thereby reducing its capability to generate that much surplus funds for useful deployment elsewhere.

Today, however, materials management is regarded as one of the most important areas of management, as it has been realised that application of modern tools and techniques can bring rich dividends in relatively shorter period of time in this area. It has been further realised that greater efficiency in Materials Management is very important as it can release significant funds for deployment by the Railways in today's situation of rising prices, dwindling budgetary support, reduced annual plan allocations, high interests and high cost of raising funds from external sources such as financial institutions and commercial banks. The materials management department, commonly known as the Stores Department is playing a greater role currently, in optimising the material costs, while laying greater stress on quality of materials and also generating revenues of the order of Rs. 3500 crores per year, at Indian Railways level, by prompt disposal of scrap – (Total scrap sale exceeded Rs.3500 crores during 2009-10).

## **3. Integrated Approach to Materials Management**

The functions of materials management cannot be viewed merely as service functions. They have considerable potential for profit making. Profits of an organisation can be increased either by doing more business, needing pumping in of more money, or by reducing expenditure with little or marginal additional investments, while maintaining the output at the earlier level. For example to earn an additional profit of Rs. 1 crore, a company may have to pump in an investment of anything between Rs 10 to 20 crores, depending on the type of industry, and may have to resort to taking loans from public and banks at high interest rates. The merit of an integrated materials management programme with the involvement of top management is that it can generate the same profit by cutting down the costs of materials and its associated activities without increasing the financial liability of the company. To get the maximum payback in the area, materials constituting bulk of the annual expenditure are to be selected and concentrated upon.

The above is equally applicable to the Railways also. In manufacturing organisations like ICF, DLW, CLW, RCF, RWF & DMW, the materials alone account for about 70% to 80% of the manufacturing costs, whereas on open zonal Railways the same is about 40% of the total annual working expenses. It can thus be appreciated that materials management is an important area in Railways also, where bulk expenditure is incurred on materials.

For example, the Railways bought materials and equipment worth over Rs. 9500 crores

during 2008-2009. A reduction of 5% on these costs by way of efficient purchases, control in consumption, applying value analysis techniques etc. will result in enhancement of the annual surplus of the Railways by Rs. 500 crores, which in fact will be a perpetual benefit year after year. In fact by efficient management, the railways have been buying less and less of materials, while at the same time the assets to be serviced have been steadily increasing.

For generating the same level of surplus as above, if investments are thought of as an alternative measure, the Railways would require every year additional funds to the tune of about Rs. 10000 crores, which will not be easy to come by in these days of capital shortage, high interest rates, reduced plan allocation and dwindling budgetary support.

It will thus be seen that various functions related to materials management have considerable potential to enhance the financial viability and profitability of the organisation as a whole. In order to achieve this objective, an integrated approach to the different functions is essential. In the olden days even in the private industries also this was absent and functions of purchasing, storekeeping etc. were attached to the other executives and naturally became subsidiary functions. However, now the concepts have changed and more and more industries are now adopting integrated approach by centralising the various functions under one man, known as the Materials Manager. On Indian Railways, the integrated materials management functions have been entrusted to the Stores Department.

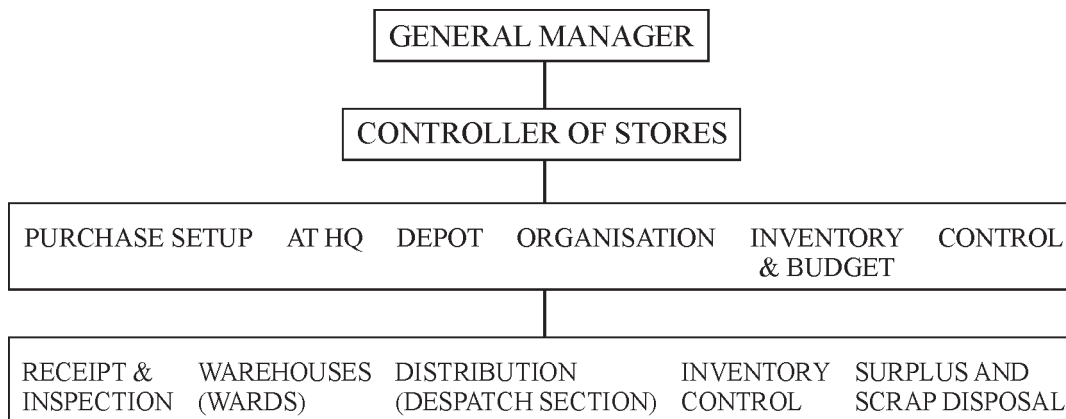
#### **4. Organisational Setup on I.R.**

The network of Indian Railways is owned and managed by the Central Government. The entire operation is controlled and directed by the Railway Board in the Ministry of Railways. For easy management and control, the entire network of Indian Railways has been divided into 16 Zones like Central, Eastern, Northern, Southern etc. and each zonal Railway is under the control of a General Manager. Each zonal Railway is further subdivided into Divisions for better control on operations. There are in all 68 Divisions operating on Indian Railways. Besides the 16 Zonal Railways, the Indian Railways own six modern manufacturing units known as Production Units. These are (i) Chittaranjan Locomotive Works, Chittaranjan (ii) Diesel Locomotive Works, Varanasi (iii) Integral Coach Factory, Perambur (Madras) (iv) Diesel Modernisation Works, Patiala (v) Wheel and Axle Plant, Yelhanka, Bangalore (vi) Rail Coach Factory, Kapurthala. Each of these production units is also headed by an independent General Manager. The General Managers of zonal Railways and production units are assisted by heads of different departments, such as Chief Engineer, Chief Operating Manager, Chief Commercial Manager, Financial Adviser and Chief Accounts Officer, Controller of Stores etc., as the case may be.

##### **4.1 Organisation for Integrated Materials Management on Indian Railways**

On Indian Railways an integrated approach to the materials management function already exists. The Controller of Stores of each Zonal Railway or Production Unit, under whom the various functions are integrated, is the principal head of the department like any other head of department and he reports directly to the General Manager. All functions relating to Materials Management namely, purchasing, warehousing, distribution and disposal are under the Controller

of Stores (COS) who organises the delicate balancing act of what to procure, when and how much to procure and hold as stocks and how to distribute within the constraints of budgetary allocations, but at the same time striving to maintain a high service level. The organisational chart indicating the materials management set up on a zone of Indian Railways is as under.



In addition to the above, the printing and supply of stationery and supply of forms has also been placed under the Controller of Stores.

The operation of Railways is spread over the length and breadth of the country. The problems on Railway are, therefore, more complex than that of a manufacturing unit, as thousands of indentors are spread over a large geographical area. The Railways have to plan locations of various stores depots with care so that the lead remains minimum for the distributin of stores. Normally store depots are located close to the places activities such as Workshops and Loco Sheds and are known as attached or associated depots. In addition, Stores Depots for materials of general nature, which are required by most of the indentors on line, are situated at convenient locations from where supplies can be affected to all indentors. Such stores depots are called General Stores Depots.

Depending on their location, stores depots are also called by other different names. Depots attached to mechanical workshops are called as Mechanical Stores Depots; depots serving exclusively engineering departments are called Engineering Stores Depots, Track Depot etc; Stores attached to the Diesel and Electric Loco Sheds are called Diesel Stores Depots and Electric Loco Stores Depots respectively. There are depots like EMU/DEMU Car Depot and Signalling Depots associated with EMU/DEMU Car Care Sheds and Signalling Workshops. Depots catering exclusively to the supply of stationery and forms are called Stationary and Forms Depots.

#### 4.2 Depot Organisation

Stores depots are generally supervised by Gazetted officers of the Stores Department who are called as Depot Officers. This officer is responsible to the Controller of Stores for prompt service to the indentors in his territory. The Depot Officer is assisted by other officers & staff like

Senior/Asstt. Materials Manager (SMM, AMM), Depot Materials Superintendents (DMS's) etc.

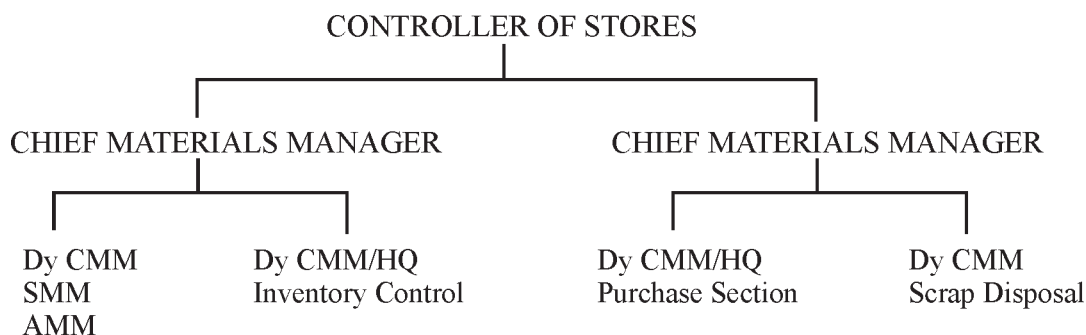
The work structure in a typical Railway Stores Depot is as below.

- (i) Receipt and Inspection of stores.
- (ii) Storage and Issue of stores.
- (iii) Distribution of stores to outstation indentors.
- (iv) Maintenance of ledgers
- (v) Recoupment of stocks
- (vi) Disposal of Surplus and Scrap stores
- (vii) Local Purchase during emergency
- (viii) Inventory Control

A stores depot is further divided into different storage wards for stocking of different types of stores and to deal with work as mentioned above. There are also Divisional Stores Depots functioning under DRM's dealing with supply and distribution of various items to Division.

### 4.3 Purchase Organisation

The purchase function is centralised in the Headquarter office of the Controller of Stores. However, for petty purchases, the powers have been delegated to the Depot Officers and other field officers too. The Controller of Stores is assisted by various officers who hold administrative charge of different purchase sections, which is somewhat as below:



The purchase sections are generally under the charge of Dy. Chief Materials Managers, Sr. Materials Managers and Asstt. Materials Managers. The function of inventory control at the HQ level for the entire Railway functions is decided locally. This organization evolves suitable policies and monitors the progress on inventory control as a separate cell called PSIC section.

In respect of track materials, the purchases are currently done directly by the Chief Engineer

with the assistance of the Chief Engineer (Track Purchases) posted in each Railway.

## **5. Role of Stores Department in Activities of Railways**

Railways need over 1.80 lakh items consisting of nearly 1 lakh unique items for their maintenance, operation and manufacture activities and for construction projects. The Stores Department has to ascertain the needs of a Railway in the matter of materials. Besides, Stores Department has to arrange supply of materials or stores in the most efficient, economical and expeditious manner possible. It is responsible for planning, purchase, receipt, inspection and disbursement of various stores required by thousands of indentors spread across length and breadth of the country. Besides, the disposal of inactive, obsolete, surplus and scrap stores is also the responsibility of Stores Department. For the purposes of giving the desired service in making materials available, when required, the stores department decides which items should be purchased in advance and which items should be kept in stock and which items are to be purchased as and when required by the indentors, known as non-stock items. In addition to providing service to various other departments, the stores department has to follow suitable policies so that it can also contribute to maximising profitability of the Railway organisation as a whole. It is the duty of Stores Department to maintain levels of stock to ensure maximum service level and minimum blockage of capital.

## **6. Role of Indenting Departments in Aiding Stores Departments in Discharge of its Functions:**

The role of indenting department is not merely to consume the stores, but they have a positive role in the efficient discharge of materials function by the Stores Department. One of the important functions for which indentors are responsible is the amount of material they need. They have to forecast the requirements of materials for maintenance activities based on past experience in maintenance management. Similarly, the indentors in the field of production prepare material schedules for the production activities as also for the construction projects. It is essential that these forecasts or material schedules are prepared well in advance so that the materials are available at the right time. While sending these requirements to the Stores Department, the probable availability of such stores in the market may also be kept in mind as these factors affect the lead time for the procurement of materials. The indentors should also exercise budgetary control to keep the expenditure within limits as the materials form a major portion of the expenditure. It is, therefore, necessary for them to develop proper procedures to have effective control on materials drawn from the Stores Department.

Some of the functions which are related to materials are handled by the actual users of the Railways. It is, therefore, necessary that they contribute their bit in improving the profitability of the Railways. The indentors are expected to indent only stock items, to the extent of the requirements as forecast earlier, keeping in view the cost, and fill in the material requisitions clearly and in prescribed manner. It is essential that the indentor should clearly mention the specifications on the indent along with the description and it should be such that the quality demanded is just enough for the purpose for which the materials are indented (keeping in view



the cost factor) and in right quantity. Similarly, expression of urgency for delivery has to be resorted to with caution as the procurement price for early delivery will be invariably higher. The projection of requirements ultimately affects the expenditure of their departments and hence indentors have to be equally concerned with the materials functions.

## **7. Categorisation of Stores**

On Indian Railways, Stores Department is required to provide service to various departments by making available over 1.80 lakh items, when required. In order to provide optimum level of service to indentors, these items are kept in stock at various stocking points called Stores Depots for ready drawal. These items are essential for maintenance, manufacture and operation of Railways, whose demand is frequent and non availability of such items can cause huge stockout cost. These items are, therefore, called stock items. For stocks items, it is the responsibility of the Stores Department to make them available readily, whenever demanded by a user (indentor). Besides, there are other items which are essentially of one-time or occasional requirement for which reasonable time will be available for procurement and hence no stock of such items is maintained, such items are known as non stock items. These items, which include equipment like computers, photo copiers, machinery for workshops, hospital equipment, are purchased on as-and-when-required basis to meet the specific demands. Materials of low annual consumption value of less than Rs. 5000 are also arranged as non stock items as the administrative cost of managing these as stock items will be high.

For the Stores Department to assume responsibility for a material as stock item, the user department should first identify the need for stocking an item and then submit a Stocking Proposal on prescribed proforma to the Stores Department, indicating the full description, governing drawing/specification, estimated annual consumption with justification, estimated unit rate and value. This application will be scrutinised by the Stores Department, first at associated Depot level and later at Stores Headquarters level. If the stocking proposal is justified, the Stores Department will stock the item, intimating the user department about the Depot from where the material may be drawn in future. However, for obvious reasons, no such procedure is necessary for non stock items.

Stock items are further categorised as under:

### **(i) Ordinary Stores**

Ordinary Stores are those materials which have generally regular turnover due to constant demand for maintenance, manufacture and operational requirements. Bulk of the total stock items come under this category.

Examples: steel raw materials, oils, greases, paints, loco, carriage & wagon components.

### **(ii) Emergency Stores**

The stores which are not required frequently, but still where stocks have to be maintained for ready use are called 'emergency stores'. These comprise items of stores which do not ordinarily wear out or require renewal, but are required instantly due to sudden breakage or unanticipated

deterioration. Such items are not readily available in the market and as such would require long time for procurement in case they are not stocked. The stockout cost would be quite high, if such items are not readily available in the stores when required.

Examples: spare parts of machinery and plant, components of rolling stocks and locomotives requiring replacements rarely.

### **(iii) Special Stores**

The items of stores required for works and other special purposes i.e. other than for operation, ordinary maintenance or repairs are called 'special stores'. Generally such items are supplied to the indentors against direct supply orders without being stocked in the stores depots.

## **8. Classification of Railway Stores**

On Railways over 2.72 lakh items are stored in various Stores Depots for maintenance, manufacture and operations. In order to handle so many items, it is necessary to have a system whereby their identification is easy and the disbursement is quick. In olden days, Railways had evolved alpha-numeric system of identification of stores. However, due to progressive computerisation of the inventory control, need was felt for numeric system of identification of stores items. This system of codification encompasses the techniques of commodity identification, classification, coding, and recording of codified data. The requirements of such classification and codification system are very briefly mentioned below:-

- (a) Unique item identification;
- (b) Division and sub division of stores into manageable segments;
- (c) Use of standard language or method for description of an item;
- (d) A machine sensible coding structure for processing data on computers;
- (e) Standardisation;
- (f) Classification and sub-classification to help get proper information for better understanding by users.

In view of these various objectives in mind, the earlier classification of stores (alpha-numeric) which was in use for a long time was revised in 1967-68 with the commencement of computerization of inventory control. The items have been classified into different groups as shown in Annexure-A. It would be seen that the groupings are done in such a way that represent broadly the type of Rolling Stock or Group of items. Besides, these main groups have been divided into further sub-groups, which generally represent end use of the item(s). In case of general items, the same have been classified in groups based on commodities.

Under each group, standard nomenclature list is prepared on the Railways. In the nomenclature list, following information is given:-

- (i) Item Code No.

- (ii) Complete description of the item.
- (iii) Specification and/or drawing number and details.
- (iv) Unit in which the item is accounted.
- (v) Stocking Railways and Stocking Depots.

A code number of an item is a unique number which is a modulus-11 based eight digit numeric code. The first two digits represent the group number, next two digits sub-group number, next three numbers the serial number of the item and the last digit represents check digit. This (e.g., PL No.37130262) can be written as under:-

XX	XX	XXX	X(8 digits)
Group	Sub-group	Item Number	Check Digit
37	13	026	2

A nomenclature list when it includes the Book Average Rate is called Price List and the Code Number is called 'PL Number'.

**How to check** whether a PL Number is correct and valid, as per Modulus-11?

Example: PL No. 3 7 1 3 0 2 6 2  
                   8 7 6 5 4 3 2

Spare the right most digit (2 in this PL) as a check digit. Now go left multiplying each digit of lower line (from 1 to 7) to the digit right above in the top line i.e.,  $2 \times 6=12$ ;  $3 \times 2=6$ ;  $4 \times 0=0$ ;  $5 \times 3=15$ ;  $6 \times 1=6$ ;  $7 \times 7 =49$ ;  $8 \times 3=24$ . Now add up result of each.  $12+6+0+15+6+49+24 = 112$ .

Now divide  $112/11 = 2$ , and Remainder is 2. If remainder is the same as check digit, the PL being checked using Modulus-11 is correct, otherwise incorrect. In this case, remainder is 2 and check digit is also 2, which means PL is correct.

## 9. Classification of Railway Stores

The list of main groups is enclosed as Annexure 'A'. The nomenclature lists are printed by EDP Centres of the Railways and circulated to various indentors for use in preparation of indents. It is, therefore, essential that the indentor consults the nomenclature list to see whether the item is a stock item or not and only then he can take the correct description, specification/drawing reference and unit etc. from the list, while preparing the indent. Besides, he has to indicate the Consignee Code, the head of Accounts Allocation and the Depot Code on which the indent is placed (normally on the nominated depot).

## 10. Unification and Standardisation of Nomenclature

As is mentioned above, the classification is primarily meant for identification of items kept in stock which run into lakhs on the Indian Railways. Compilation of a nomenclature list also helps

in preparation of proper indents and its compliance. Normally, Railways keep on adding new items to the list of their stock items and update the nomenclature list locally. Thus deletion of old items and addition of new items (expressed or identified in the stores inventory database as PL Numbers) is an ongoing process in a healthy materials management system. Consequently, there are number of common items which have separate nomenclature and code numbers on different Railways. It is desirable to have only one nomenclature and code number for each item, whether stocked by one Railway or more. When this exercise is extended to rationalise the description and specification drawings etc., the same is called Standardisation. By these two exercises, we reduce the number of items which is called 'variety reduction'. The main advantage of these exercises is that whenever there is necessity for exchange of information between two or more Railways on any item such as for the purposes of the last purchase rate, quantity available as surplus or overstocks, the same is properly understood and identified without any difficulty. Therefore, compilation of Unified Nomenclature list goes a long way in ensuring better inventory management.

Annexure A

<b>Price Ledger Main Groups</b>	
<b>Group Numbers</b>	<b>Details of Groups</b>
00 to 09	Steam Locomotives & Fittings
10 to 19	Diesel Locomotives & Fittings
20 to 29	Electric Loco parts & Fittings
30 to 39	Carriage, Wagon, EMU Rail Car parts & Fittings
40 to 49	Electric Stores
50 to 59	Signal & Telecommunication Stores
60 to 69	Engineering Plant, Machinery & Parts
70 to 99	General Stores

