

A Study of Materials Management System in a Large Mining Organization

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ABSTRACT

Inventories are indispensable to run the plant efficiently. It helps to maintain both material inputs and the manufactured output at an optimum level of requirement. While inventories are necessary to absorb input and demand variations, a balance is needed between blocked capital in the inventories and impact on production. The materials management department is expected to provide operational convenience with a minimum possible investment in inventories. In this paper I would discuss the Inventory Management system followed in a Large Mining Organization owned by Government of India. This study addresses the overall inventory management system followed at one of the units of this organization. The study focuses on understanding and analyzing current inventory system being practiced in the organization. Further, a set of recommendations to improve the system are also made.

Key Words: Inventories, Inventory Management System, Current Inventory System, Optimum level

1. INTRODUCTION

Inventory management covers effective management in all its aspects including materials planning, programming and purchasing, inventory control, receiving, warehousing and store keeping, materials handling and disposal of scrape & surplus stores. The importance of materials management can be emphasized in India where the cost of material accounts for nearly 60% of the production / total cost. The facts highlight the importance of the efficient and effective use of materials particularly in the present time of credit squeeze and unstable market conditions.

Inventories are very important to the management of an industrial undertaking as they have direct bearing upon the profits of the concern. Since profits are affected by the element cost, and inventories constitute nearly two third of the total cost of the production, their effective control is now the primary concern of modern management.

2. OBJECTIVE OF THE STUDY

The objective of this study is to critically examine and understand the practices and performance of Materials Management functions adopted in an Industrial Organization. This case study helps to know the functioning of an organization and also highlights the various problems being faced within the organization. This study addresses the overall inventory management system followed at one of the units of this Manufacturing organization. The study brings out the detailed analysis of inventory management system followed in the above organization, the observations, issues and valuable suggestions.

3. ORGANIZATION

The organization is a Manufacturing one and is a vertically integrated metal producer in India engaged in a wide spectrum of activities ranging from exploration, Mining, Beneficiation, Smelting, Refining and Continuous Cast Rod manufacturer. Types of stores maintained at this organization are –

- Raw materials
- Spares
- Operational supplies
- Consumables and other supplies.

4. THE METHODOLOGY USED FOR THE STUDY

- Collection of Data using field visits, direct interviews and telephonic interaction.
- Case study method
- Contents analysis and summary of observations
- Issues and valuable suggestions

5. CURRENT PURCHASE AND INVENTORY SYSTEM AT THIS ORGANIZATION

The following are the salient features of current procedures of inventory system at this mining organization –

5.1. Stores and Inventory Management

Inventory Policy:

The organization maintains 3 months inventory on staggered delivery basis at its central stores. Issues are made to the site stores of the consuming departments against their demand.

Spares Inventory System:

To maintain and run the machine / equipment, the organization maintains spare parts inventory of about

25%. The spare parts inventory is divided in three groups as follows:

- Running maintenance inventory
- Over running (preventive maintenance) inventory
- Over hauling inventory

Stock Items:

The following items are kept as stock items at this organization.

- PVC cables
- Copper winding wire
- Nuts and bolts
- Bulbs, tube lights, choke and starter
- PVC tape
- HRC fuse

Supply to shop floor:

Besides central stores, site stores are created to meet the day today requirement of shop floor. Central stores make supplies to site stores as per their requirement and site stores issue the material to shop floor people.

Warehouse Policy:

Items have been distributed in different groups centrally (In Central Stores) keeping in mind the requirement of the indenting departments. The six digits and ten digits codification system is followed. All items are codified. Items are stocked nature wise and tagging is done for easy identification. Apart from central store there exist site stores also. The items are issued from central stores to the site stores of the indenting department.

5.2. Inventory Costing Policy:

For costing the materials Weighted Average method is adopted. This method is quite straight forward, it takes the weighted average of all units available for sale during the accounting period and then uses that average cost to determine the value of cost of goods sold and ending inventory. For example, let's say that a bakery produces 200 loaves of bread on Monday at Rs.1 each, and 200 more on Tuesday at Rs.1.25 each. The Weighted average cost for inventory would be $\text{Rs}1.125$ per unit, calculated as $(200 \times \text{Rs}1 + 200 \times \text{Rs}1.25) \div 400 = \text{Rs}1.125$

Rate Contract Policy:

Following items are under rate contract:

Safety items:- like Gum boots, leather shoes, helmet cells, belts and Globes

Explosives:- like drill rods, drilling spares and

Automobile spares are covered under rate contract.

Control System:

The measures taken for cost reduction and controlling the purchase costs are as follows:

- Cost reduction through entering into rate contracts.
- Cost reduction by cutting consumption after scrutinizing the indenter’s requirement by a well-established Inventory Control Cell.
- Cost reduction by negotiating the rates.

5.3. Procurement Cycle:

Figure 1.0 describes the procedural cycle at this organization.

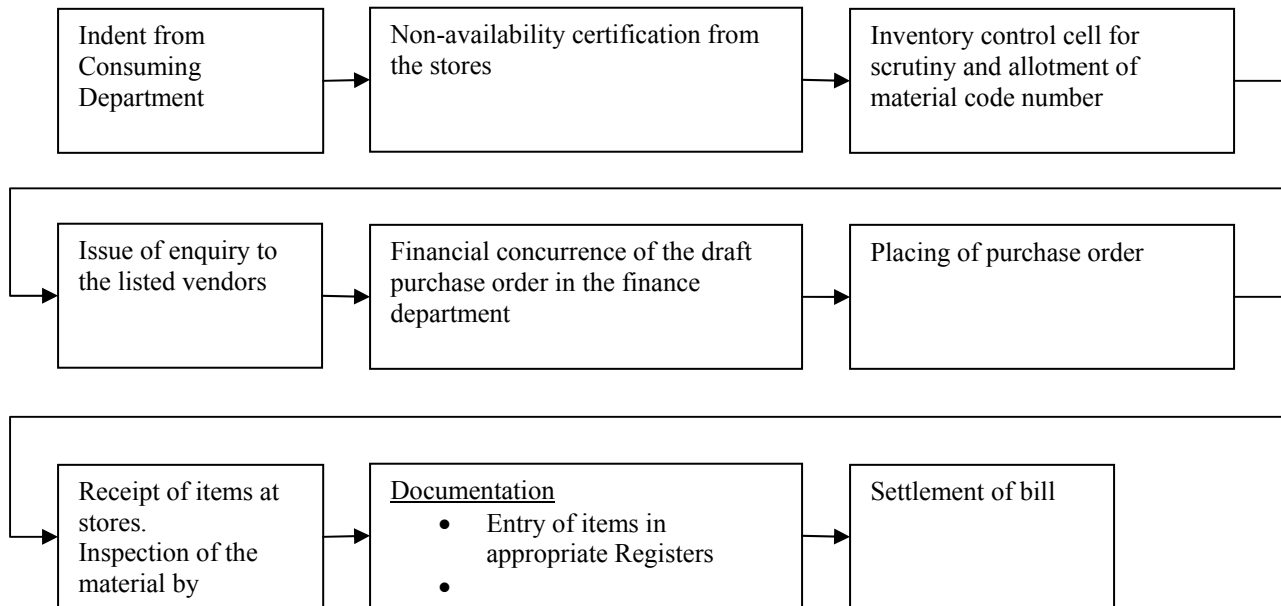


Fig. 1.0

As can be seen from the above schematic diagram of purchasing, the consuming department raises the indent and takes non availability certification from the stores. The indenter generally suggests names of the suppliers if known to him. The indent is then submitted to the inventory control cell where the indent is scrutinized and material code number is allotted to the item under procurement. The indent is then passed on to the purchase department for procurement of the item. Purchase department makes an entry in the register and then the enquiry is floated to the prospective suppliers. Four kinds of enquiries are floated depending upon the nature and value of the item. (1) Limited tender enquiry (2) Single tender enquiry (3) Open tender enquiry and (4) Global tender enquiry. Sealed quotations are called from the

vendors. Offers are opened on a given date and time by a committee consisting of a purchase officer, a finance officer and one more representative from the purchase department. The vendors are allowed to be present while opening the quotations. A comparative chart is prepared and sent to the indenting department for technical recommendations. Normally, lowest offer is preferred unless it is technically not suitable. After recommendation, the draft supply order is prepared by the purchase department and submitted to the finance department for financial concurrence and subsequent Executive Director’s approval. On receipt of the approval of the Executive Director, the purchase order is placed to the firm. Regular follow – up is done to receive the supply in time. If the supplier fails to supply the material in time, he is penalized for late delivery.

When the material is received, it is inspected by the inspection team from the indenting department. Entries are made in the daily receipt book (DRB). Entries are also made in the computers. Receipt voucher (RV) is prepared and sent the finance for settlement of the bill of the supplier.

5.4. Selective Inventory Control System

Adoption of Inventory Control Techniques:-

Automatic indenting is done for ‘C’ class (general consumable) items. However, for ‘A’ and ‘B’ class items, manual reviewing is done on regular basis.

FSN classification is adopted in this organization to control the obsolete items whether spare parts, or raw materials or components. Items are classified as Fast moving, Slow moving and Non-moving – FSN - according to their consumption pattern. Items issued and consumed in the last one year are placed in the Fast moving category, items consumed after a year but within three years are placed in the Slow moving category, and items consumed after three years or not consumed at all are placed in the Non moving category. FSN classification is done at the time of accounts closing. It excludes the insurance items/ equipments.

ABC Analysis: Every year computer section carries out an ABC analysis for all stock items furnishing the items in descending order of their annual consumption value and classifying them under the following heads:

- A Items: Initial 70% of consumption value.
- B Items: Following 20% of consumption value.
- C Items: Following 10% of consumption value.

To ensure that the inventory level of the stock item is kept at reasonable level, the safety stock of one month is kept in the case of 'A' items, 2 months for 'B' items and 6 months for C items. Normally, annual ordering is done in the case of 'A' items with phased delivery schedule to ensure that minimum level as prescribed above of the safety stock is maintained. In the case of certain 'B' items also the annual ordering is resorted to. The ordering in the case of 'C' items is done on the basis of the indents raised by the computer section. However, there is built in provision for increase or decrease in quantity of consumption especially in the case of 'A' items by regular checks.

5.5. Administrative System

Man power Management:

The Materials department is headed by Assistant General Manager (AGM). Besides AGM, the department has many other officers. Each officer is assigned to procure a particular kind of material. Say for example, one is responsible to procure electrical items; the other is responsible for plant machinery and so on. Besides materials background, few persons from technical background too are placed in Stores and Purchase department.

6. OBSERVATIONS

On the basis of the current system of Inventory Management in this Large Mining Organization, following observations are made

6.1. Ordering and Inventory Management System

No System for Determination of Order Quantity Based on Inventory Cost:

The objectives of inventory management are to provide the required level of customer service and to reduce the sum of all costs involved. To achieve these objectives, two basic questions must be answered; one, how much should be ordered at one time? And two, when should an order be placed?

Management must establish decision rules to answer, how much should be ordered at one time and when should an order be placed? Economic Order Quantity (EOQ) basically answers these questions. The advantages of EOQ are many. However, EOQ is not being followed at this organization. Inventory carrying and inventory ordering costs do not form part of the ordering policy which is likely to result in higher working capital requirement and inventory cost.

Ordering System:

More beaurocracy is involved in ordering which results in time delays. The lead-time is very high (for consumable items, 180 days and for spares, 270 days approximately). Material is not made available in time to the consumers. Shop floor and maintenance people seem to feel dissatisfied. No efforts seem to be made to develop the vendors. Vendor development and management are being given considerable importance in modern materials management. Therefore, an organization should move towards developing strong and productive relationship with its vendors.

Poor Control on purchase costs:

Controlling purchase cost will lead to profitability. However, methods adopted to control the purchase cost are not found adequate. Cost reduction by purchasing in lot size is not followed. Consolidation of purchases as well as good vendor relationship can assist in cost reduction and better cost management. Cost price analysis is not done which is very important especially for items which are procured on single quotation basis. Only few items are covered under rate contract.

Poor Buyer – Seller relations:

The vendors are not happy because their payments are inordinately delayed. In many cases, it was found that the suppliers were not paid even after one to two

years of the receipt of the materials. This has resulted in losing many reputed suppliers. The enquiry was floated to many registered suppliers but the response was very poor. As a result, the company was finding it difficult to have competitive rates and the material was being procured on high prices. After getting the order, the vendors do not supply the material in time due to their apprehensions of not getting payments after supply. In many cases the materials department could not get released the dispatch documents of the suppliers from the banks and the suppliers had to take back their goods unwillingly. This has resulted in poor buyer – seller relations. The purchase department does a lot of correspondence to get the supply in time resulting in waste of man-hours and follow up cost.

6.2. Procurement Cycle

Repeat Order not in place:

There is no system followed to repeat the earlier order in spite of the rates and specifications of the item being same. As the lead-time is very high (for consumable items, 180 days and for spares, 270 days approximately) at this organization, repeat order may prove fruitful.

6.3. Administrative System

Poor Man Power Management:

Baring few persons like AGM, Chief Manager, and Manager, none of the persons working in the Stores and Purchase department have the materials management degree. Many persons from technical departments are placed in Stores and Purchase department who do not have sound knowledge of materials management.

7. SUGGESTIONS:

Following legitimate suggestions are being made to improve the current system

7. Ordering and Inventory Management System Inventory Management System:

Inventory carrying and inventory ordering costs do not form part of the ordering policy, which is likely to result in higher working capital requirement and inventory cost. Management must therefore, establish decision rules to answer as to how much should be ordered at one time and when should an order be placed?

For achieving this objective, Economic Order Quantity system should be followed so that Inventory carrying and Inventory ordering costs are at minimum to avoid higher working capital requirement.

Ordering System:

To avoid more beaureocracy in ordering which results in time delays leading to idleness of man and machines, ordering system should be simplified. This may include computerization of all purchase functions, which would reduce routine clerical activity by the automatic preparation of documents, e.g. purchase requisition, draft purchase orders (DSOs), Purchase orders, acknowledgement forms and progress letters. Strong and productive relationship with the vendors should be developed. Cash purchases for small value items may be introduced. This will result in shorter delivery time as well as purchases can be made at very short notice.

Control of Purchase costs:

Controlling purchase cost will lead to profitability. Purchasing in lot size will result in Cost reduction. Consolidation of purchases as well as good vendor relationship and Vendor development can assist in cost reduction and better cost management. More items should be covered under rate contract. Cost reduction can also be achieved by extensive negotiation with the vendors.

Vendor Relations:

The organization should develop good relations with mutual interest with its vendors as good vendor relationship can assist in cost reduction and better quality management. Good relationship can go a great way to enhance the good name and prestige of the company. When it is difficult to get a scarce item, a supplier for the sake of his good relations, will undertake to supply it and might put himself to inconvenience if need be. It is therefore, as much necessary to develop goodwill between a company and its suppliers as between it and its customers.

The company should ensure that the payments should be made to the suppliers in time. The practice of making payments for so many supplies of a vendor in one go at a later date (say after 6 months or one year) should be avoided. This will not only remove the burden of large amount payments in one time by the company but also enhance the good buyer–seller relations.

7.2. Procurement Cycle

Repeat Order Policy:

A repeat order policy be introduced with the conditions that if the rates and specifications of the item are same, an order can be repeated within a stipulated period, say, within 6 months or so. As the lead-time is very high at this organization, repeat order may prove fruitful. Purchases through repeat order facilitate immediate purchases for user's

satisfaction. A repeat order would ensure timely purchases, which would help avoid production losses.

7.3. Administrative System

Man Power planning:

A policy of professional management be evolved in order to place right persons on right jobs. Persons without specialized back ground at times are unaware of the right kind of procedures / practices and as a result may add up to procurement cost and litigation in some cases. The function of the Materials management is a specialized one and therefore, it should be carried out by the persons who have the expertise in materials management field. Hence, the materials department must have the persons with specialized background. They should have the degree / diploma in materials management. From the current policy of the generalized pool of manpower, a specialized function based well trained manpower management is needed. Also, a policy of continuous up gradation of skill to keep pace with the changing technology need to be evolved.

CONCLUSION:

In this paper we have studied inventory management system in a Large Mining Organization. Supply chain is very important for this organization to avoid disturbance in the manufacturing process. However, it is observed that current inventory management practices are not able to achieve this objective. As the requirement of the shop floor and maintenance people is not met in time, the production losses are witnessed. Production targets are not achieved. To overcome this problem, it is very important to have a better inventory management system in place. As it may not be possible due to cash flow problem for the organization to change the system in totality, suggestions are made which can be incorporated without any significant investment and are likely to improve the management of the inventory system.

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I would like to take this opportunity to introduce my self. My name is Dr. Sharif and I have been working with Indian Institute of Technology Kanpur (IITK) India, a world class Institution in the field of Technical Education. Also, previous to joining IIT Kanpur, I had worked with Hindustan Copper Limited (A Public Sector Undertaking owned by Government of India), as a Senior Materials Officer. I have wide knowledge of Materials Planning, Purchase, Stores and Inventory Management, Stores verification and Accounting, Rate Contract, Customs, Excise, Sales Tax, Negotiations, Drafting and Monitoring of Contracts, Vendor development, Imports, Inventory Control and General Administration. As far as my qualification is concerned, I have done my Masters in Management Science (Materials) from Pune University (India) and Ph. D in 'A Critical Appraisal of Inventory Control Techniques and Practices' from CSJM University Kanpur (India). I have published some good papers in national and international journals. My book on "A Critical Appraisal of Inventory Control Techniques and Practices" is ready for publication. I have attended many workshops and conferences in the past.