A

PROJECT REPORT
ON
"INVENTORY MANAGEMENT"

FOR

MAHINDRA SONA LIMITED

SUBMITTED TO

SAVITRIBAI PHULE

PUNE UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENT

OF

MASTER OF BUSINESS ADMINISTRATION (MBA)

SUBMITTED BY

Miss. PRANALI RAVINDRA PATIL

MBA [FINANCE]

UNDER THE GUIDANCE OF

Prof. PRABHODHAN PATIL

SANDIP

FOUNDATION

DEPARTMENT OF MANAGEMENT STUDIES

SANDIP INSTITUTE OF TECNOLOGY &RESEARCH

CENTRE,NASHIK-422213

2019-20

SANDIP FOUNDATION'S
SANDIP INSTITUTE OF TECHNOLOGY & RESEARCH CENTRE
Mahiravani, Trimbak Road, Tal. & Dist. : Nashik - 422213, Maharashtra, India.
Phone : (02594) 222 551, 222552, 222 553, 222554, Fax : (02594) 222 555
Website : www.sandipfoundation.org E-mail : principal@sitrc.org

Department of Management Studies
(Approved by AICTE, New Delhi, Affiliated to Savitribai Phule Pune University, Pune & Recognized by Govt. of Maharashtra)

Ref: SF/SITRC/MBA/PROJ/2019-20/ **Date:** 13 /11 /2019

CERTIFICATE

This is to certify that Mr /Ms Pranali Ravindra Patil has completed his / her Summer Internship Project (SIP) entitled INVENTORY MANAGEMENT at MAHINDRA SONA LIMITED satisfactorily as a partial fulfillment of the requirement of **Master of Business Administration (MBA)** course of **Savitribai Phule Pune University, Pune** during the academic year 2019-20.

Project Guide

Prof.(Dr) Rakesh S.Patil
Head-MBA

Prof. (Dr) Sanjay T. Gandhe
Principal

Internal Examiner

External Examiner

MAHINDRASONALIMITED

P.B.No.8, Plot No 89/1A, MIDC, SATPUR, Nashik 422 007
Telephone: +91-253-6610500 Fax: +91 - 253 6610504
E-mail: mslnsk@mahindrasona.com

19th July 2019

CERTIFICATE

This is to certify, miss. Pranali Ravindra Patil. student of ,Sandip Institute Technology And Research Centre pursuing M.B.A in finance has undergone summer internship Program in this organization from,20th may, 2019 to 17th July, 2019.

During in this period she has done project viz- **"Inventory Management"**

During the above period she was found to be very sincere in her work and her performance was found to be appreciable. We wish her all the best in her future.

For Mahindra Sona Limited,

D. N. Mahale
General Manager (Personnel & Admin)

STUDENT DECLARATION

I undersigned hereby declare that, the project entitled, “INVENTORY MANAGEMENT ”is executed as per the course requirement of two full time MBA program of Savitribai Phule Pune University. This report has not been submitted by me or any other person to any other University or Institution for degree or diploma course. This is my own and original work**.**

Place:

Date: **PRANALI RAVINDRA PATIL**

ACKNOWLEGEMENT

It is great full pleasure to me in acknowledgement my deep sense of gratitude to all those who have helped me in completing this project successfully.

First of all I would like to thanks Pune University for providing me an opportunity to undertake a project as partial Fulfilment of MBA degree.

Special thanks to Mr. **Shirish Kale** (Head of Account Dept.) for providing me an opportunity to work with MAHINDRA SONA LTD, and providing me necessary information about their organization, their operation and providing guidance in developing my project.

My acknowledgement would not be completed without mentioning the name of the project guide Prof**. Prabhodhan Patil** whose valuable guidance at every phase of the project has helped to prepare this project success.

Finally, I would like to express my sincere thanks to my family, all the faculties, and friends who helped me in some or other way in making this project**.**

Place:

Date: / / **PRANALI RAVINDRA PATIL**

CONTENTS

LIST OF GRAPHS

LIST OF TABLES

Chapter No. 1

EXECUTIVE SUMMARY

1. Executive Summary

The Indian Automobile Industry faces some tremendous opportunities and also great challenges. The growth in automobile sales has been impressive for the past ten years since liberalization began. However, with liberalization, the Indian customer has been presented with a wide range of choice in automobiles, to suit every requirement and budget. The market has turned in to buyers market where the customer is being wooed by the manufacturers and the dealers with a range of freebies unheard of before in India. Financing has become so easy that an automobile is within every aspirant's reach. India the second fastest growing market in the world following China, which recorded a 42 percent growth. In the domestic market, the sales were driven by car and the two-wheelers. While the cars segment posted a 25.10 percent growth in 2009-10, the two-wheelers witnessed a 26 percent surge, but just a year back the same industry was in a global secession. There was a sharp decline in demand for all types of products services.

As we know that Mahindra Sona Ltd. is a production unit. Whenever production term comes then first thing comes in our mind that is inventory. Because inventory is base for any production unit so, when we control and manage the inventory properly then the company is benefited. (By reducing holding and carrying cost of inventory.) Thus after studying inventory Management the importantactivity which is done on quarterly basis in the account department is Budgetary Control in which operating Budget expenses is to be control in Mahindra Sona Ltd.

A Budget is a plan which relates to a definite period of time and which is expressed in quantitative terms. It is thus a predetermined statement which incorporates the policy of the management during a given period and serves as a standard for comparing the actual results. Thus a budget is a tool in the actual results. Thus a budget is tool in the hands of the management which serves as a guide to all the employees in achieving their goals objectives and targets.

A budget can help us a planning and coordination with all the employees, and departments, but the most important factor is that it is used for control purposes at all levels of management.

INTRODUCTION OF PROJECT

I have great pleasure in presenting my project report. The subject of my project is Inventories Management and control. And in Mahindra Sona ltd. is completion of this subject I have chosen, Mahindra Sona ltd SATPUR, Nasik. Today the base of the country economic development and trade is depending upon inventories management.

The topic is regarding inventory management& control. The company is being producing unit and understanding price. It is very necessary to maintain the inventory in the company, without maintaining it; it become very difficult to run the business efficiently and effectively. I have study of classification of inventory recording, techniques of inventory management, various method of inventory management. And study inventory turnover ratio, calculation of economic order quantity.

Inventories management:-

Inventories constitute the most significant part of current assets of large majority of companies in India .the large size of inventories maintained by firms a considerable amount of fund is required to be committed to them. it is therefore absolutely in order to avoid unnecessary investment .a firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately.

Chapter No. 2

OBJECTIVES

2.1 OBJECTIVES

- To study inventory management at Mahindra Sona Limited Company.

- To study and analyze various inventory levels such as economic order quantity, Maximum level, minimum level, re-order level.

- To study the types of inventory control techniques.

2.2 SCOPE OF THE STUDY

- Various production operations can be performed economically and independently. It can allow temporary variations in operating rates.

- Provides protection against uncertainty of demand and supply.

- It will also help the company to analysis the movement of stock in the future.

- The project was conducted under the efficient guidance of qualified and expert staff in their fields.

- Information on new techniques of inventory was acquired.

- Provide and maintains good customer service.

- Enables smooth flow of good through the production process.

2.3 LIMITATIONS

- Generally company does not allow outsiders to conduct any study or research work in company. Therefore, get the projects get in the company itself was very difficult.

- Due to the confidentiality some important information, which are important for the project could not be collected.

- Some of the information lack in accuracy, due to which approximate values where use for the analysis. Hence, the results also reveal approximately values.

- The project is based on theoretical guidelines and as per the situation prevalent time of the practical training. Hens it may not be applicable to difference situations.

- The times span for the project is very short which of the 2 months, which itself acts as a major constraint moreover studying the guideline and applied it practical with in such short time was a task of great pressure.

Chapter No.3

INDUSTRY PROFILE

2. INDUSTRY PROFILE

MAHINDRA SONA LTD.

The manufacturing unit is situated at Nashik about 180 kms. North-east of Mumbai and employs about 370 people. Its constructed area is around 10000 Sq. meters.

The Nashik Plant commenced production in 1979 following a technical and financial joint venture between Mahindra & Mahindra Limited and Dana Corporation USA, named Mahindra Spicer Limited.

In 1984, Mahindra Spicer Limited merged with its parent company Mahindra& Mahindra Limited and became MSL Division of the parent company. In March 1995, Mahindra & Mahindra Limited and Sona Koyo Steering Systems Ltd formed a new company MAHINDRA SONA LIMITED to take over the automotive component business of MSL Division of Mahindra & Mahindra Ltd.

The Company is engaged in designing and manufacturing a wide range of auto ancillary products such as propeller shafts, clutches, universal joint kits, steering joints, steering column parts and axle shafts. The company is original equipment supplier to almost all vehicle manufacturers in India and caters to the spare parts market through a wide distribution network. The company also supplies to vehicle manufacturers and Tier 1 suppliers outside India.

The Company has been certified for ISO-9001 in 1995 and QS-9000 in 1999. The Company firmly believes that the high standards of quality can only be achieved through strong systems and the support of its people.

Mahindra Sona Limited manufactures Propeller Shafts / Cardan Shafts and components for Automotive Applications like Passenger Cars, Multi Utility Vehicles, Sports Utility Vehicles, Light Commercial Vehicles, Medium Commercial Vehicles and Heavy Commercial Vehicles.

MSL Drive Shafts also cater to vide Industrial Applications like Earth Moving Equipment, Engine Dynamometer Testing , Radiator Fan Drive for Railways, Steel Rolling Mills, Printing Machineries etc.

MSL's other products include Steering Universal Joints for Automotive Applications like Passenger Cars, Multi Utility Vehicles, Sports Utility Vehicles, Light Commercial Vehicles, Medium Commercial Vehicles and Heavy Commercial Vehicles.

MSL also manufactures Spindle and Sleeves of Steering Column Intermediate Shafts for the following categories:

- Multi Utility Vehicles / Sports Utility Vehicles
- Light Commercial Vehicles
- Medium Commercial Vehicles
- Heavy Commercial Vehicles

Recent addition in Mahindra Sona Limited's' product range is Rubber Coupling for Steering Application for Multi Utility Vehicles, Sports Utility Vehicles and Earth Moving Equipment's.

The other product line of Mahindra Sona Limited is for the Automotive Clutches. This includes the world's latest Diaphragm Type (DST as well as Ring Type) and the conventional lever type for Passenger Cars, Multi Utility Vehicles, Sports Utility Vehicles, Light Commercial Vehicles, Medium Commercial Vehicles, Heavy Commercial Vehicles and Farm Tractors.

Various models of Driven Plate Assemblies are used in

- Passenger Cars
- Multi Utility Vehicles / Sports Utility Vehicles
- Light Commercial Vehicles
- Medium Commercial Vehicles
- Heavy Commercial Vehicles
- Farm Tractors

Chapter No. 4

COMPANY PROFILE

MAHINDRA SONA, NASHIK

3.1 COMPANY PROFILE

Name of the company :- MAHINDRA SONA LIMITED

Address :- Mahindra Sona Ltd, Plot No. 89/1 MIDC

SATPUR , Nashik- 422007

Phone No. :- 0253 6610500

Fax no. :- 0253 6610504

Strength of Employee :- 370 { approx. }

Product :- propeller shaft, Universal Joints, Steering Joint,

Clutch, Axle Shaft

Establishment :- 1979

Mission And Vision :- Mahindra Sona ltd are committed to satisfied our customers by Designing manufacturing and delivering product through a well-defined quality system meeting TO/TS 16949 standard and continuously Improve our products process and system.

Vision- Mahindra Sona Ltd is guided by its powerful vision to be a "Supplier of Choice" to global customers.

Mission –We at Mahindra Sona Ltd are committed to satisfy our customers by designing, manufacturing and delivering products through a well-defined quality system meeting ISO/TS 16949 standard and continually improve our products, processes and systems.

Values - "Mahindra Sona Ltd recognizes its employees as its vital strength for combating competition and ensuring continual growth. MSL strives to create a work environment that nurtures respect for individuals, excellence in the pursuit of goals and dedicated service to the customer. MSL endeavors to direct the energies of its employees to make MSL a "Supplier of choice" to Global customers.

3.2 COMPANY HISTORY

The company has a long history, which dates back to the year 1885 when M/S Turner Hoare & Co. started its activity in imports and exports of traditional India consumer goods.

In 1968, M/S Turner Hoare & Co. took over another company M/S East Asiatic Co. and realistic market potential entered into execution of engineering projects like hydro-pneumatic ash handling system, mechanical cleaning like Vibrio screen, traveling Water screens and bagged import substitution award twice.

In 1977, with equity participation of Dana Corporation, USA, the company went into technical collaboration to manufacture automotive components like Propeller shafts, Axle shafts, UJ Kits, Automotive clutches.

The Nashik plant commenced production in 1979 following a technical and financial joint venture between Mahindra & Mahindra Ltd. And Dana Corporation USA, named Mahindra Spicer Ltd.

In 1984, Mahindra Spicer Ltd. Merged with its parent company Mahindra & Mahindra Ltd. And became Mahindra Sona Ltd. In March 1995, Mahindra & Mahindra Ltd. And Sona Koyo Steering Systems Ltd. Formed a new company Mahindra Sona Ltd. to take over the automotive component business of MSL division of Mahindra & Mahindra Ltd.

MAHINDRA SONA LTD. was formed in collaboration with Dana Corporation of USA, over 2 decades ago through access to international technology and has since emerged as a leading independent manufacturer of automotive components. These include Propeller shafts, UJ components and automotive clutches. Progressively, MSL has expanded its products range to meet the demands of various automotive manufacturers.

The facilities contain more than 9300 meters of manufacturing space strategically located in western India providing easy accessibility to various vehicle manufacturers and provide ample scope for future expansion to almost 5 times the current size. MSL has a strong team of 350 employees of which 50 are qualified engineers and professionals.

3.2.1 MILESTONS OF MAHINDRA SONA LIMITED

1. 1968- Collaboration agreement between Mahindra group and Dana corporation USA for manufacturing clutches.

2. 1976- Collaboration agreement between Mahindra group and Dana corporation of popular shaft and universal joint in a joint venture company Mahindra Spicer Limited.

3. 1984- Merger of Mahindra Spicer Limited with Mahindra and Mahindra Limited. Become MSL division of Mahindra and Mahindra Limited.

4. 1986- Dana collaboration ends.

5. 1994- Formation of Mahindra Sona Ltd. Restructure of MSL division as a Mahindra Sona Ltd.

6. 1995- ISO 9001 Certification by TUV-CERT Germany.

7. 1996- Scientific work measurement Technique adopted, cellar manufacturing and "Flow production" introduce.

8. 1999- QS 9001 Certification by TUV-CERT Germany.

9. Launched 2002- Group Kaizen activity.

10. 2003- Export to Indonesia begins.

11. 2004- TPM kick off

12. 2005- ISO/TS 16949.

1. 2006- New export plant opening.

2. 2007- Formation of 4 Joint Ventures with.

    1. JTEKT-Sona Automotive India Ltd.

    2. Fuji Kiki- Sona Fuji Kiki Automotive Ltd.

    3. American Axle-AAM Sona Axle Pvt. Ltd.

    4. Arjan Auto- Arjan Stampings Ltd.

3.2.2 MAJOR CUSTOMERS OF MAHINDRA SONA LTD.

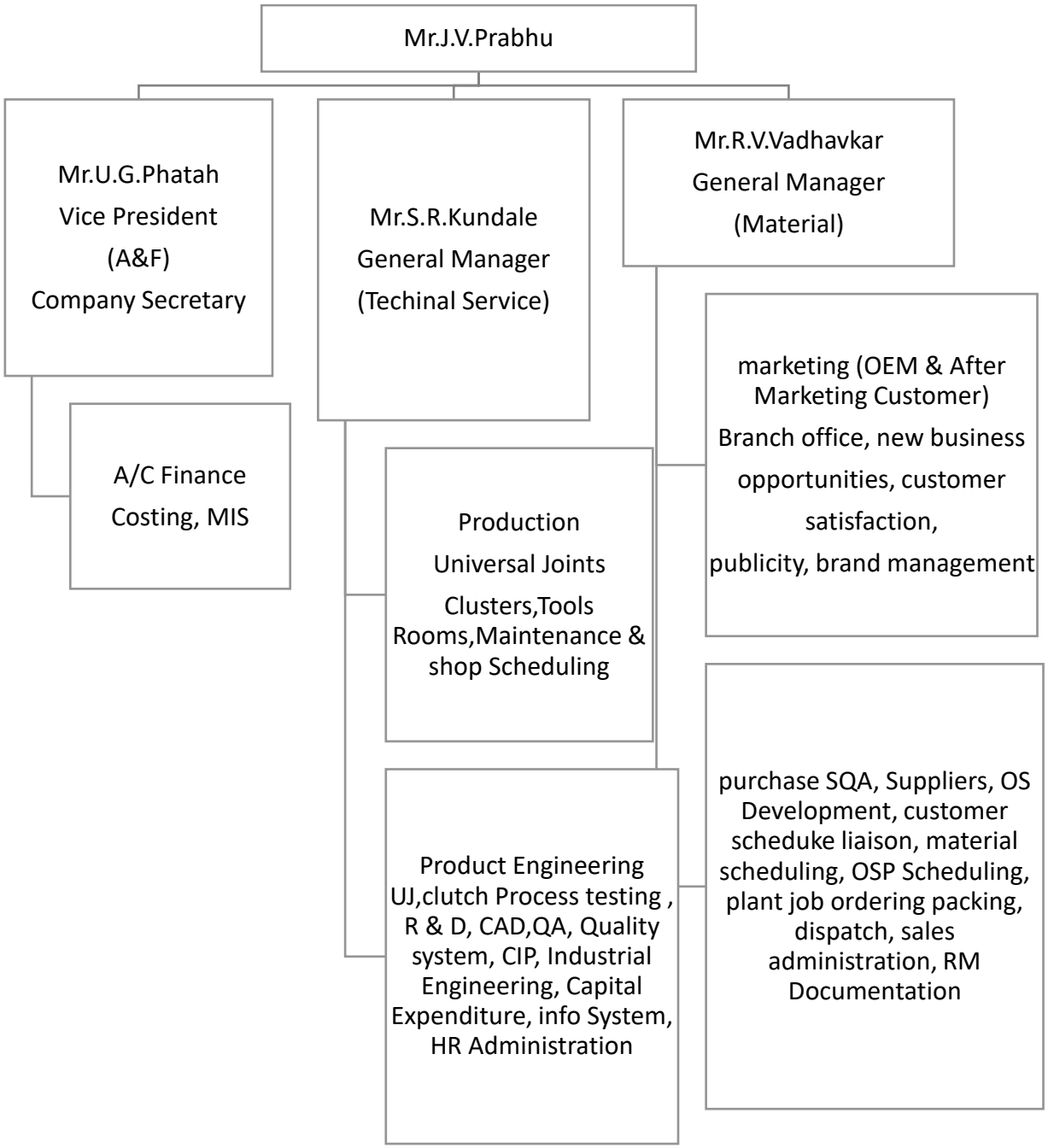
1. Arvin Meritor USA
2. Ashok Leyland
3. Continental engineer USA
4. Force motors
5. Hindustan motors
6. JCB India U.K
7. Kubota manufacturing USA
8. Mahindra and Mahindra
9. Rane TRW steering
10. Sona khoya steering system.
11. Tata motors
12. Sahara motors PVT.LMT
13. Vehicle factory Jabalpur
14. ZF steering.

3.3 COMPANY PRODUCT

Products	Application	Products picture
1} CLUTCHES	➢ Malty Utility vehicles ➢ Passenger cars ➢ Trucks ➢ Jeeps	
2} AXLE	➢ Malty Utility vehicles ➢ Jeeps ➢ Trucks ➢ Light commercial vehicles	
3} CV JOINT	➢ Heavy duty vehicles trucks ➢ Light commercial vehicles ➢ Passenger cars three wheelers	

4} UNIVERSEL JOINT	As a components for propeller shaft ➢ Heavy duty trucks ➢ Light trucks	

3.4 ORGANISATION CHART OF MSL



Chapter No.4

THEORETICAL BACKGROUND

4.1 Meaning of Inventory

Inventories are stock of the product a company is manufacturing for sale andcomponents that make up the product. The various forms in which inventories exist ina manufacturing company are: raw materials, work-in-process and finished goods.

- **Raw materials** are those basic inputs that are converted into finished product through the manufacturing process. Raw materials inventories are those units which have been purchased and stored for future productions.

- **Work-in-process** inventories are semi-manufactured products. They represent products that need more work before they become finished products for sale.

- **Finished goods** inventories are those completely manufactured products which are ready for sale. Stocks of raw materials and work-in-process facilitate production, while stock of finished goods is required for smooth marketing operations. Thus, inventories serve as a link between the production and consumption of goods.

4.3 Importance of Inventory

The importance of inventory to an organization can be listed as follows

- Provides and maintains goods customer service.
- Enable smooth flow of goods through the production process.
- Provides protection against uncertainty of demand and supply.
- Various production operations can be performed economically and independently. It can allow temporary variations in operating rates.
- By purchases in bulk, discounts can be availed.

Good Inventory Policy

A good inventory policy should consist of the following features:

- There should be proper accounting and physical controls.
- The inventory should be stored properly to avoid the losses like breakage, spoilage, wastage, damage, deterioration, pilferage, etc.
- Fixation of inventory levels like minimum, maximum and re-order levels and Economic order quantity (EOQ) to ensure the optimum level of stock.
- Proper care should be taken to avoid stock out situations.
- Continuous supply of material should be ensured at the right time and right cost.
- The investment in inventory should be optimized by avoiding over stocking.
- Regular monitoring of stock movements and reduce the investment in dormant and slow moving stocks.

4.4 Fixation of Inventory Level

Various levels of inventory are fixed to see that no excess inventory is carried and simultaneously there will be any stock outs.

1. Re-Order Level: It is the level of stock availability when a new order should be raised. This level is fixed between the minimum and maximum stock levels and following formula is useful for this purpose:

Maximum usage x Maximum lead time.

2. Minimum stock level: It is the lower limit below which the stock of any stock items should not normally be allowed to fall. Their level is also called as ‘safety stock’ or ‘buffer stock level’.

Re-Order-(Average or normal usage x average lead time)

3. Maximum stock level: It represents the upper limit beyond which the quantity of any item is not normally allowed to rise to ensure that unnecessary working capital is not blockd in stock items.

Re-Order level + EOQ= (minimum usage x maximum lead time)

4. Danger level: It is fixed below the minimum stock level and if stock reaches below this level, urgent action for replenishment of stock should be taken to prevent stock out position.

Average consumption x lead time for emergency purchases.

5. Average stock level: It is the average of minimum and maximum stock levels.

Minimum stock level + maximum stock level

4.5 Types of Inventory Control Systems

1. ABC Analysis:

It is a system of inventory control where discriminating control is exercised over different items of stores classified on the vases of investment involved. Usually the items are divided into three categories according to their importance, namely their value and frequency of replenishment during a period.

1. 'A' category of items consists of only a small percentage i.e. about 10% of the total items handled by the stores but require heavy investment (in rupee value) about 70% of the total inventory value.
2. 'B' category of items (relatively less important) constitutes 20% of the total items handled by stores, having an investment (in rupee value) of about 20% of the total inventory value.
3. 'C' category consists of large number of items handled by stores say 70% having relatively small investment say 10% of the total inventory value.

ABC Categories:

Each item of material is given A, B or C designation depending upon their value

Item A: Large value for few items.

Item B: Medium value of more items.

Item C: Remaining items.

Category	% of total items	% of total Material cost
A	5 to 10	70 to 85
B	10 to 20	10 to 20
C	70 to 85	5 to 10

In above table, it is shown that 5 to 10% of total quantity accounts for 70 to 85% of the value. There are 'A' category items which need very strict control because of their high cost significance. 'B' category items range for 10 to 20% value. These items need routine type of control. 'C' item account for 70 to 85% of total items accounting for 5 to 10% total value.

The rules regarding purchasing, storing and issuing of various categories of items should be formed accounting to the valued and importance of each item.

VED Analysis:

It is the process of listing items under three classes. The analysis is important especially where non- availability of less value items can be very critical. This can ensure production holds-up of entire lines, where WIP inventory builds up to corers of rupees. Typical cases are aircraft and ship overhaul, production of items requiring higher imported materials and components like special transistors, diodes and similar devices.

'v' stands for vital items and their stock analysis requires more attention because out of stock situation will result in stoppage of production. Thus, 'v' items must be stored adequately to ensure smooth operations of the plant.

'E' means essential items. Such items are considered essential for efficient running but without these items, the system would not fail. Car must be taken to see that they are always in stock.

'D' stands for desirable items which do not affect the production immediately but availability of such items will lead to more efficiency and less fatigue.

2. FNSD Analysis:

'F' stands for fast moving items and stocks of such items are consumed in a short span of time. Stock of fast moving items must be observed constantly and replenishment orders be placed in time to avoid stock-out situations.

'N' stands for normal moving items and such items are exhausted in a year or so. The order levels and quantities for such items should be on the basis of a new estimate of future demand, to minimize the risks a surplus stock.

'S' indicates slow moving items, existing stock of which would last for 2 years or more at the current rate of but it is still expected to be used up. Slow moving stock must be reviewed very carefully before any replenishment orders are placed.

'D' stands for dead stock and from its neither existing stock nor further demand can be foreseen. Dead stock figures in the inventory represent money spent that cannot be realized but it occupies useful space. 'v' stands for vital items and their stock analysis requires more attention.

3. SDE Analysis:

The scare, Difficult and Easy classification relate to difficulty in obtaining these items. A scare items may not be easily available in market or maybe it is difficult to manufacture or there are only few manufactures available and lead item is too much, or items may be imported one. Such item need higher level of stocking.

4. SOS Analysis:

SOS Analysis is based on seasonality of the items and it classifies the items into two groups S (Seasonal) and OS (i.e. Off seasonal)

Seasonal and are only available only for a limited period. For example, agricultural produce like raw mangoes, raw materials for cigarette and paper industries etc. are available for a limited time and therefore such items are procure to last the full year.

Seasonal but are available throughout the year. Their prices are lower during harvest time. The quantity of such items are required to be fixed after comparing the cost savings due to lower prices if purchased during season against higher cost of carrying inventories if purchased throughout the year.

6} Economic Order Quantity (EOQ) Model:

After various inventory items are classified on the basis of the A B C analysis. A key inventory problem particularly in respect of the Group. An items relates to the determination of the size or quantity in which inventory will be acquired. In other words, while purchasing raw materials or finished goods, the questions to be addressed are 8. How much inventory should be bought in one lot under one order on each replenishment? Should the quantity to be purchased be large or small? Or, should the requirement of materials during a given period of time (say, six months or

26 one year) be acquired in one lot or should it be acquired in installments or in several small lots? Such inventory problems are called order quantity problems. Buying in large quantities implies a higher average inventory level which will assure (i) smooth production/sale operations, and (ii) lower ordering or set-up costs. But it will involve higher carrying costs. On the other hand, small orders would reduce the carrying cost of inventory by reducing the average inventory level but the ordering costs would increase as there is interruption in the operations due to stockouts. The optimum level of inventory is popularly referred to as the economic order quantity (EOQ). It is also known as the economic lot size. The economic order quantity may be defined as that level of inventory order that minimizes the total cost associated with inventory management. EOQ refers to the level of inventory at which the total cost of inventory comprising acquisition/ordering/set-up costs and carrying cost is minimal.

$$EOQ = \frac{2AO}{C}$$

A = Annual usage of inventory (unit)

O = Ordering cost per order

C = Carrying cost per unit

Assumptions

- The firm knows with certainty the annual usage (consumption) of a particular item of inventory.

- The rate at which the firm uses inventory is steady over time.

- The orders placed to replenish inventory stocks are received at exactly that point in time when inventories reach zero.

7} GOLF analysis:GOLF analysis like SDE analysis is based on the category of suppliers on the criteria of quality, lead time, terms of payment, continuity or otherwise of supply and administrative work involved, the analysis classifies the items into four groups namely GNGL and F.

G group covers items procured from government suppliers such as the STC, MMTC and public sector undertakings. Transactions with th9is category of suppliers involve long lead time and payments in advance or against delivery.

NG group comprises of items procured from non-government suppliers. Transactions with this category of suppliers involve moderate delivery time and availability of credit, usually in the range of 30 to 60 days.

L group contains items bought from local suppliers. The items bought from local suppliers are those which are cash purchased or purchased on blanket orders.

F group contains those items which are purchased from foreign suppliers. Such transaction like Necessitate search of foreign suppliers, Require opening of letter of credit, Involve lot of administrative and procedural work.

8} MNG analysis:

MNG analysis is based on stock turnover rate and it classifies the items into M (moving item), N (non-moving item), G (ghost items).

M is moving items are those items which are consumed from time to time. N is non-moving items are those which are not consumed in the last one year, G is ghost items are those items which had nil balance both in the beginning and at the end of the last financial year and there were no transactions during the year.

This analysis mainly helps to identify non-existing items for which the store keeps bin-cards or waste computer stationary while preparing stores ledger. Stores department even might have ear-marked space for these non-existed items.

9} Just in time:

The time based approach to inventory management came in to Focus when Toyota Motors company came out with the concept of Kanban in 1950.This lead to the dramatic reduction in WIP quantities tying the inventory closely to the demand from subsequent process or internal customer.Kanban is conceptually a two-bin system a Signal being raised to warrant replenishment.

JIT approach became a modern production system seeking to implement concept of stockless production.JIT embraced a variety of manufacturing concepts like reduced lot size ,quick switch over (SMED),load leveling(response to tact time),group technology,Statically process control (control charts),preventive Maintenance and quality circle.Quick communication of the consumption of old stock which triggers new stock to be ordered is key to JIT and inventory reduction.This saves warehouse and costs.

10} Vendor managed inventory:

VMI provides the customer multiple material flow solutions based upon a 'plan for every part' concept. Not every part in a manufacturing process is planned, transported, and consumed equally. One major objective of industry is for production suppliers to 'Replenish based on consumption' allowing the leveling of customer orders over time. To accomplish this task, it have moved from weekly to daily shipments requesting suppliers to ship smaller lot sizes and supporting milk-run and full truck load deliveries to the plants. Suppliers are able to view current stock-on-hand levels, quickly determine correct shipment quantities, track ASNs and good receipts, and monitor their delivery performance. VMI also allows the supplier's planning, manufacturing, and inventory levels to improve as well. VMI suppliers were more likely to reduce their inventory levels and improve material planning requirements with their suppliers than those that did not.

Chapter No. 5

RESEARCH METHODOLOGY

5.1.RESEARCH METHODLOGY

5.1.Method of data collections:

Primary data:

The Primary data are the information generated to meet the lesser specific needs of the investigation at hand. Thus, the investigator has to collect, Data separately for the study undertaken. The following are the three methods which are used to compile primary data.

(1) Observation (2) Schedule and Discussions (3) Interview

- **Observation:**

This is one of the cheaper and more effective techniques of data collection. This approach to the collection of information is as old as human race. Much of our knowledge about human beings, rounding is collected only through this process. Observation is indispensable not only in sciences but in social sciences research also observation has its own utility. It is not always possible to quantify the data and draw accurate conclusions on the basis of such data. Thus, the observation method is generally adopted for testing hypothesis

- **Schedule and Discussions :**

The Most frequently used method of data collection is schedule and questionnaire. These methods are considered to have a particular relevance, if the researcher is to collect data on personal preferences, social attitudes, opinions, beliefs, feelings, etc. the increasing use of schedules and questionnaires is because of increased emphasis by social scientist on quantitative measurement of uniformly accumulated data.

Study of this project is done by discussing with store manager about ABC technique of managing inventory in this company. By asking some questions to company manager and other persons in company this study is completed.

- **Interview:**

Interview is also useful technique of data collection through primary sources. It is a verbal method of securing data in the field surveys. Information is obtained by conversing with the respondents

SECONDARY SOURCES OF DATA :-

Secondary data refer to the information that has been collected by someone other than a researcher for purposes other than those involved in the research project at hand. There are various factors such as the nature of the study, status of the investigator, availability of financial resources, time and degree of accuracy of the results desired, that decided the choice of the sources of data that enriches the utility of the study. The study of this project is made with the help of secondary data.

Internal Sources:

- This data is collected from the organization.
- With the help of storage data in the organization as well as information got from Store manager who gives fair idea of how inventory management is done in the organization.

External Sources:

- Company Website: Some information is collected from company website
- Books

Chapter No. 6

DATA ANALYSIS

6.DATA ANALYSIS

Technique of Inventory Management:

Main problems in inventory management are to answer:

- What are Indus problems in managing inventories?
- Which inventory policy optimum for Indus? Why? Show calculations.
- What should be the over level?

To answer these following techniques are used:
* ABC analysis
* Economic Order Quantity
* VED Analysis
* Re-Order Level
* Safety stock
* Inventory Turnover Ratio

ABC Analysis
* It is based on proposition that
* Managerial items and efforts are scare and limited.
* Some items of inventory are some important than others.

ABC Analysis:

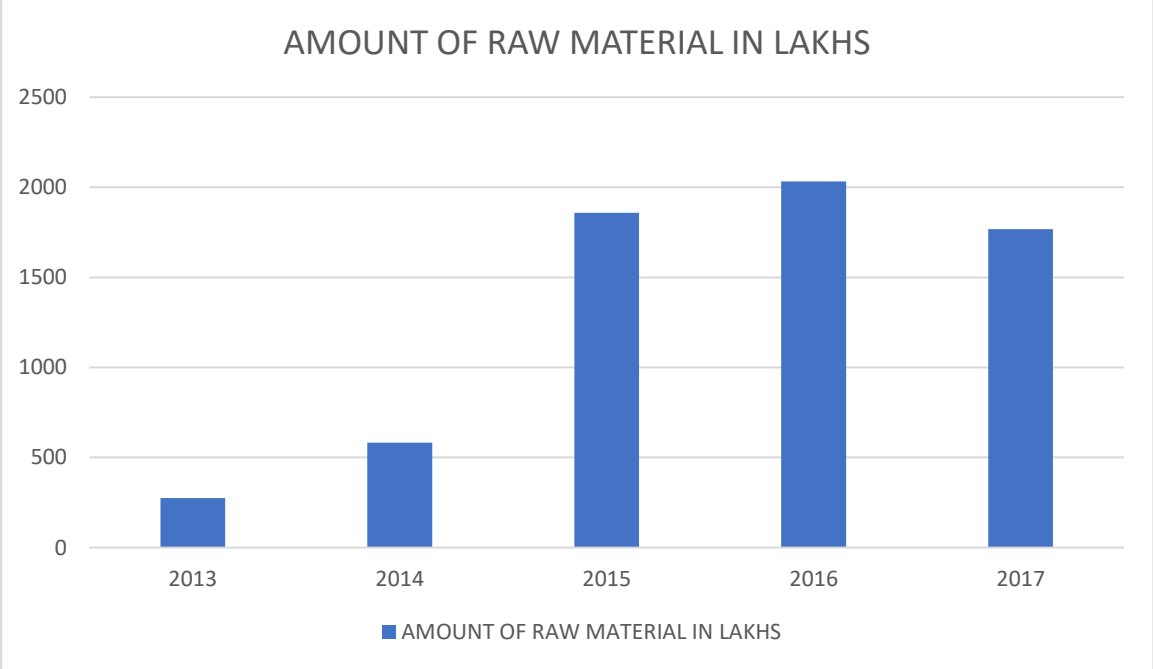
ABC analysis classifies various inventory into three sets or groups of priority the allocates managerial efforts in proportion of
The priority the most important item are classified into class - A,
Those of intermediate importance are classified as "class - B'' and remaining items are classified into class - C'.
The financial manager has to monitor the items belonging to monitor the items belonging to different groups in that order of priority and depending upon the consumptions.
The items with the highest values is given priority and soon and are more controlled then low value item. The re - rational limits are as follows.

Category	% of items	% of total cost of materials
A	5 - 10	70 - 85
B	10 - 20	10 – 20
C	70 – 85	5 – 10

Procedure
- Items with the highest value is given top priority and soon.
- There after cumulative totals of annual value consumption are Expressed as percentage of total value of consumption.
- Then these percentage values are divided into three categories. ABC analysis helps in allocating managerial efforts in proportion to importance of various items of inventory.

6.1.ABC Analysis Raw material (at closing stock)

YEAR	AMOUNT OF RAW MATERIAL (in lacs)
2013	274.94
2014	582.11
2015	1858.17
2016	2031.85
2017	1768.52

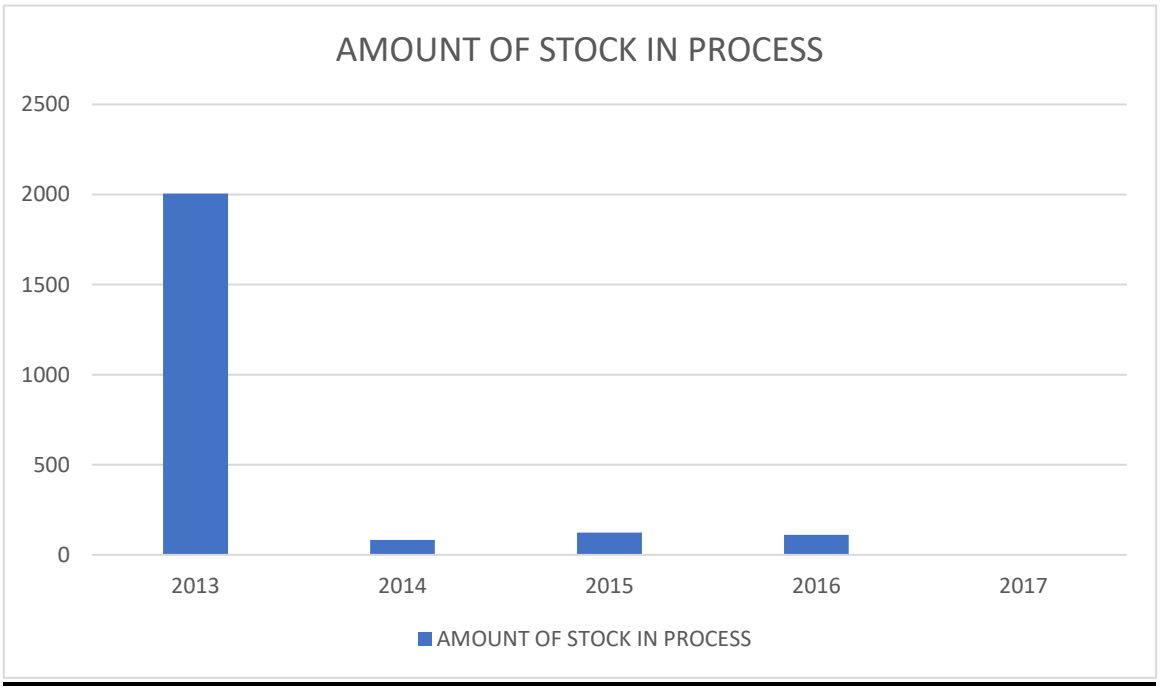


Interpretation:

The above graph shows the amount of raw materials at cost. In 2013 the cost of material is 274.94 lakhs increased in this year and2015 It is more increased to 1858.17lakhs and in 2016 it is increased to Rs2031.85lakhs and in 2017 it is decreased to 1768.52lakhs.

6.2.Stock in Process (in closing stock)

AMOUNT	AMOUNT OF STOCK IN PROCESS (in lacs)
2013	2006.20
2014	82.67
2015	122.82
2016	110.96
2017	NIL

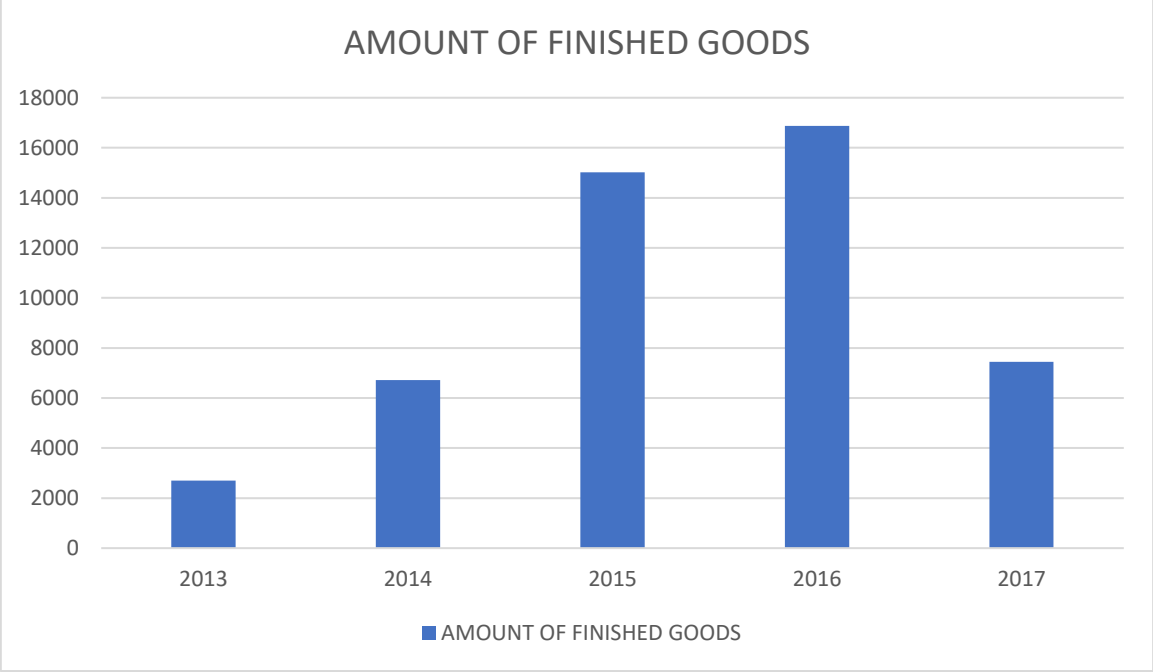


Interpretation:

The above graph shows that work in progress at cost. In 2013 the cost of material is 2006.20lakhs increased in this year and in 2014 it is decreased to Rs 82.67 lakhs in the year 2015 it is increased to 122.82 lakhs and it is also maintained in the year 2016 and in 2017 it is Nil.

6.3.Finished Goods (at closing stock)

YEAR	AMOUNT OF FINISHED GOODS
2013	2704.08
2014	6717.44
2015	15019.79
2016	16880.69
2017	7443.66

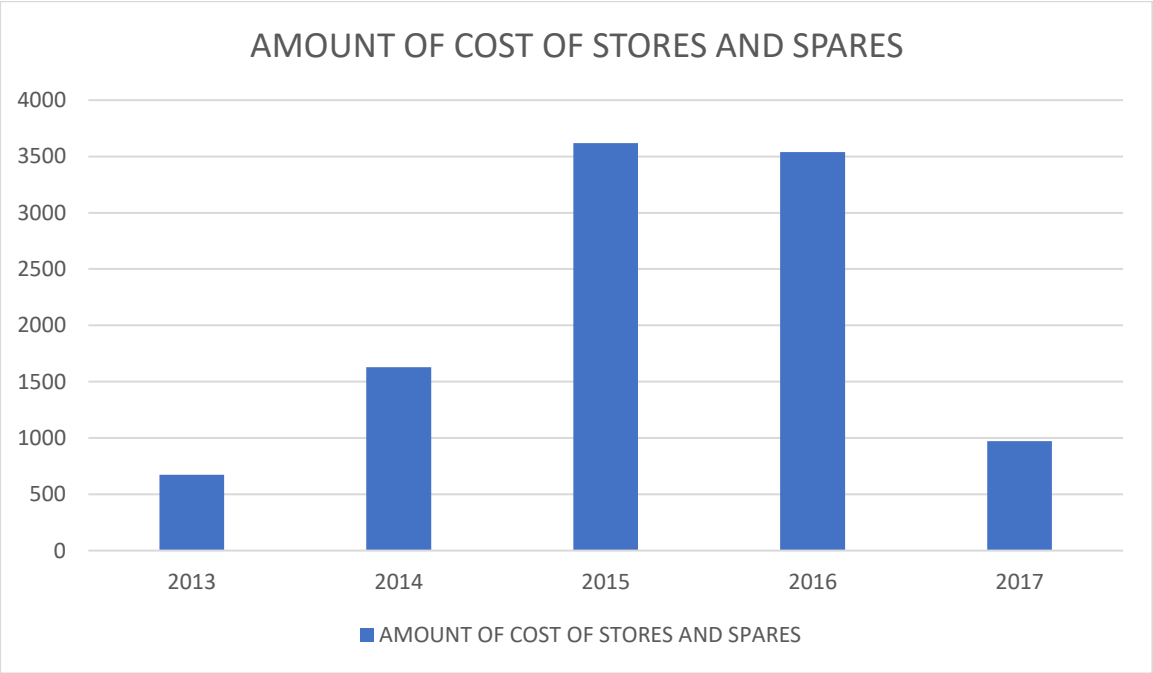


Interpretation:

The above graph shows the amount of finished goods at cost. In 2013 the cost of material is 2704.08 lakhs. It is increased to 6717.44 lakhs in the year 2014.It is increased in the year 2015-16 the cost of goods is Rs 1,6880.69 lakhs and in the year 2017 it is decreased to 7443.66 lakhs

6.4.Stores, Spares & Consumables(closing stock)

YEAR	AMOUNT OF COST OF STORES AND SPARES (in lacs)
2013	673.25
2014	1628.44
2015	3617.38
2016	3539.05
2017	973.02

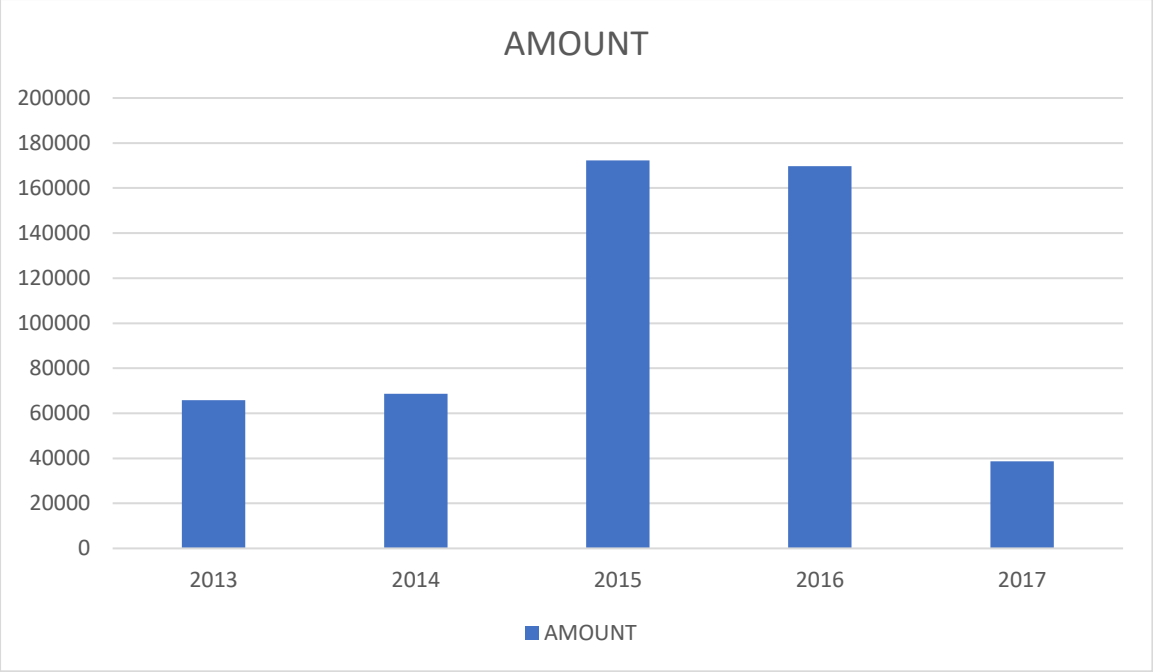


Interpretation:

The above graph shows the amount of stores and spares at cost. In 2013 the consumable is Rs 673.25 lakhs and it is highly increased to Rs 1628.44 lakhs in the year 2014.The form maintains goods in proper way Rs 3617.38 lakhs in the year 2015 and it is decreased to Rs 3539.05 lakhs in the year 2016 and in the year 2017 it is decreased to 973.02 lakhs.

6.5.Raw Material Consumed

YEAR	AMOUNT (in lacs)
2013	65875.45
2014	68699.73
2015	172305.70
2016	16,9697.36
2017	38607.65



Interpretation:

The above graph shows consumption of raw materials .The consumption of raw material in the year 2013 is Rs 65875.45 lakhs the consumption of raw material increased in the year 2014-15 in the Rs 172305.70 lakhs. And it is decreased to Rs 16,969,736,368 lakhs in the year 2016 and it decreased to Rs 3, 8607.65 lakhs in the year 2017.

6.6.Economic order quantity:

During 2013-2014:

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2013-2014.

PARTICULAR	
BILLET/BLOOMS	28,889 Qty (mgt)
ORDERING COST PER ORDER	Rs.2000
CARRING COST	10%
PURCHASE PER UNIT	400

1. Calculation of EOQ:-

Total units required (A) =28889

The ordering cost per order (O) = Rs.2000

Carrying cost per unit (C) = 10% (i.e.) 10% of Rs.400 =Rs.40

EOQ =⌐√2AO/C =2*28889* 2000/40 =Rs.1699.67

2. Number of orders for the year

= A/EOQ =2889/1699.67

=16.99~17orders 58

3. Total annual cost

= carrying cost + ordering cost

= 1445000+ 34000 = Rs.1479000

- **Carrying cost**

  = order size * average inventory

  • **order size** = A/no of orders =28889/17 = 1699.67

  • **Average inventory** = order size/2 =1700/2 = Rs.850

  • **Carrying cost** = 1700*S850 = Rs.1445000

  • **Ordering cost** = cost per order * no of orders = 2000*17 =Rs.34000

EOQ DURING 2014-2015

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2014-2015.

PARTICULAR	
BILLETS/BLOOMS	123596Qty (Mt)
ORDERING COST PER UNIT	2200
CARRYING COST	10%
PURCHASING PRICE PER UNIT	Rs 420

1. Calculation of EOQ:-

Total units required (A) =123596mt

The ordering cost per order (O) = Rs.2200

Carrying cost per unit (C) = 10% (i.e.) 10% of Rs.2000 =Rs.42

EOQ = √2AO/C = 2*123596*2200/42 = Rs.3598.354

2. Number of orders for the year = A/EOQ

= 123596/3598.354 = 34.79~35orders

3. Total annual cost = carrying cost + ordering cost

= 6245669+ 77000 = Rs.6322669 60

- **Carrying cost** = order size average inventory

• **order size** = A/no of orders = 123596/35 = 3531.31

• **Average inventory** = order size/2 = 3531.1/2 = Rs.1768.655

• **Carrying cost** = 3531.31*1768.655 = Rs.6245669

• **Ordering cost** = cost per order no of orders = 2200 *35 = Rs.77000

EOQ DURING 2015-2016

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2015-2016.

PARTICULAR	
BILLETS/BLOOMS	106,066,Qty (Mt)
ORDERING COST PER UNIT	Rs 2400
CARRYING COST	10%
PURCHASE PRICE PER UNIT	Rs.440

Calculation of EOQ:-

Total units required (A) =106066mt

The ordering cost per order (O) = Rs.2400

cost per unit (C) = 10% (i.e.) 10% of Rs.2000 =Rs.44

EOQ =√2AO/C =2 *106066* 2400/44 =Rs.3401.59

Number of orders for the year

= A/EOQ =106066/3401.59 =31.18~32orders

Total annual cost

= carrying cost + ordering cost

= 5.493154+ 76800 = Rs.5569954 62

Carrying cost = order size * average inventory

- **Order size** = A/no of orders = 106066/33/2 = 3314.56

• **Average inventory** = order size/2 = 3314.56/2 = Rs.1657.28

• **Carrying cost** = 3314.56*1657.28 = Rs.5493154

• **Ordering cost** = cost per order * no of orders = 2400*32 = Rs.76800

EOQ DURING 2016-2017

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2016-2017.

PARTICULAR	
BILLETS/BLOOMS	184,661
ORDERING COST PER UNIT	3000
CARRYING COST	12%
PURCHASE PRICE PER UNIT	500

Calculation of EOQ:-

Total units required (A) =184,661mt

The ordering cost per order (O) = Rs.3000

Carrying cost per unit (C) = 12% (i.e.) 12% of Rs.500 =Rs.50

EOQ =√2AO/C = 2*184,661*3000/50 = Rs.4, 707.37

Number of orders for the year

= A/EOQ = 184661/4707.37 = 39.23~39 orders

Total annual cost

= carrying cost + ordering cost

= 11209639+ 117000 = Rs.11326639. 64

- **Carrying cost** = order size* average inventory

• **Order size** = A/no of orders = 184661/39 = 4734.90

• **Average inventory** = order size/2 = 4734.90/2 = Rs.2367.45

• **Carrying cost** = 4734.90 *2367.45 = Rs.11209639

• **Ordering cost** = cost per order* no of orders = 3000* 39 = Rs.117000

6.7.VED ANALYSIS

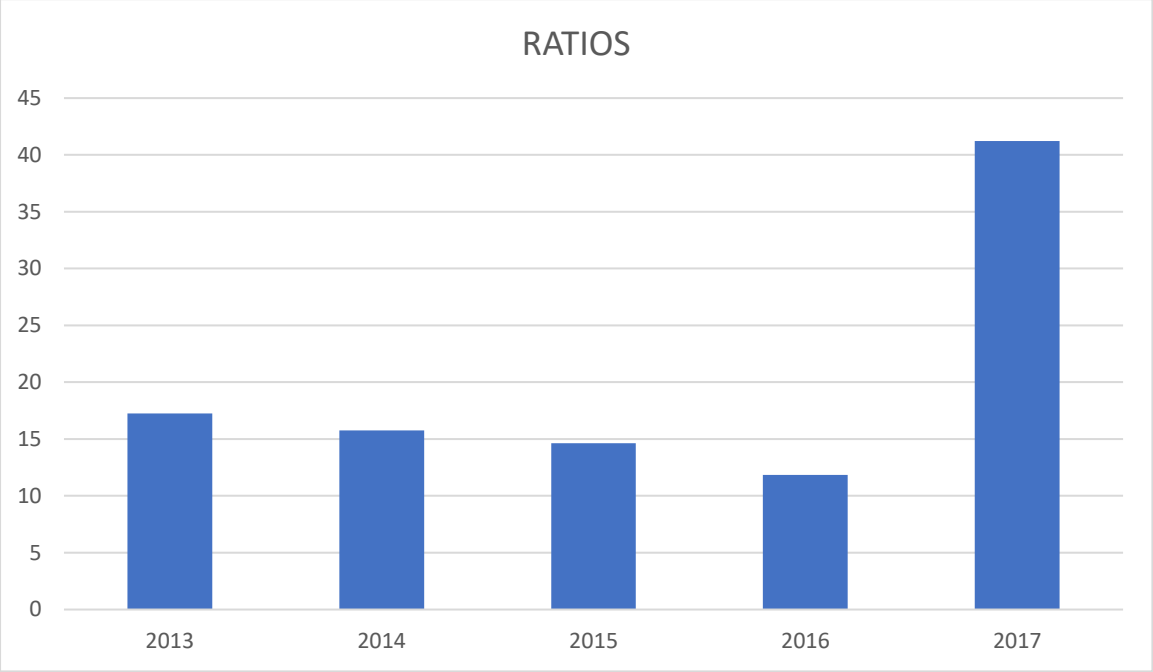
MTERIAL	CLASS	VALUES	PRIORITY	MATERIAL
10%	‘’A’’	70%	V 10% E 20% D 70%	70% 10% 10%
20%	‘’B’’	20%	V 10% E 20% D 70%	70% 20% 10%
70%	‘’C’’	10%	V 10% E 20% D 70%	70% 20% 10%

6.8.Inventory Turnover Ratio

THE FORMULA : COST OF GOOD SOLD

AVERAGE VALUE OF INVENTORY

YEAR	COST OF GOODS SOLD	AVG VALUE OF INVENTORY	INVENTORY TURNOVER RATIO
2013	70340.33	4076.86	17.25
2014	75687.45	4800.64	15.76
2015	184082.21	12583.99	14.63
2016	190053.62	16067.13	11.83
2017	419760.92	10185.20	41.21



Interpretation:

The above graph shows inventory turnover ratio of the form. The ratio can be continuously decreased from the year 2013-16.The turnover ratio of the form is 17.25 in the year 2013. The decreased turnover shows good consumption of raw material. The ratio will be decreased to 11.83 in the year 2016 but it is increased in the year 2017 is 41.21.

6.9.STOCK LEVELS

During 2013-2014

The company requires 28889 units of billets/blooms to manufacture of steel for the year 2013-14 .EOQ is 1700 units. The company makes safety stock equal to 30 day requirement and the normal lead time is 10-20 days. The company works for 300days in a year.

a. **Reorder level =**

   lead time*Average usage+ safety stock = (10*96.29) + 2888.9 = 3851.9

   Safety stock = usage * period of safety stock/ total working days in a year =28889*30/300 = 2888.9

   Average usage = usage/total working days in a year = 28889/300 = 96.29

b. **Minimum stock level** = re-order level –(Average usage * Average lead time)

   = 3851.9 – (96.29* 10+20/2) = 2408

c. **Maximum stock level** = re-order level + re-ordering quantity-(Minimum usage * minimum lead time)

   = 3851.9+1700-(96.29*10) = 5551.9-962.9 = 4589

d. Danger level = Average usage * Maximum re-order period for emergency purchases

= 96.29*20 = 1925.8

e. Average stock level = ½(Minimum stock level + Maximum stock level)

= 2408+4589/2 = 3496

During 2014-15

The company requires 123596 units of billets/blooms to manufacture of steel for the year 2014-15.EOQ is 3335 units. The company makes safety stock equal to 30 day requirement and the normal lead time is 10-20 days. The company works for 300days in a year.

a) **Reorder level**

= lead time*Average usage+ safety stock

= (10*412) + 12360 = 16480

• Safety stock = usage * period of safety stock/ total working days in a year

= 123596*30/300 = 12360

• Average usage = usage/total working days in a year

= 123596/300 = 412

b) **Minimum stock level** = re-order level – (Average usage * Average lead time)

= 16480 – (412* 10+20/2) = 10300

c) **Maximum stock level** = re-order level + re-ordering quantity-(Minimum usage * minimum lead time)

= 16480+3335-(412*10) = 19815-4120 = 15695

d) **Danger level** = Average usage * Maximum re-order period for emergency purchases

= 412*20 = 8240 **Average stock level** = ½(Minimum stock level + Maximum stock level)

= 10300+15695/2 = 13000

During 2015-16

The company requires 106066 units of billets/blooms to manufacture of steel for the year 2015-16.EOQ is 3257 units. The company makes safety stock equal to 30 day requirement and the normal lead time is 10-20 days. The company works for 300days in a year.

a. **Reorder level**

   = lead time*Average usage+ safety stock

   = (10*354) + 10606.6 = 141476

   • Safety stock = usage * period of safety stock/ total working days in a year

   = 106066*30/300 = 10606.6

   • Average usage = usage/total working days in a year

   = 106066/300 = 354

b. **Minimum stock level =** re-order level –(Average usage * Average lead time)

   = 14147 – (354* 10+20/2) = 8837

c. **Maximum stock level** = re-order level + re-ordering quantity-(Minimum usage * minimum lead time)

   = 14147+3257-(354*10) = 13864

d. **Danger level** = Average usage * Maximum re-order period for emergency purchases

   = 354*20 = 708

e. **Average stock level** = ½(Minimum stock level + Maximum stock level)

   = 8837+13864/2 = 11350

During 2016-17

The company requires 184661 units of billets/blooms to manufacture of steel for the year 2016-17.EOQ is 6155 units. The company makes safety stock equal to 30 day requirement and the normal lead time is 10-20 days. The company works for 300days in a year.

a. **Reorder level**

   = lead time*Average usage+ safety stock

   = (10*615.53) + 18466.1 = 24621.4

   • Safety stock = usage * period of safety stock/ total working days in a year

   = 184661*30/300 = 18466.1

   • Average usage = usage/total working days in a year

   = 184661/300 = 615.53

b. **Minimum stock level** = re-order level –(Average usage * Average lead time)

   = 24621.4 – (615.53* 10+20/2) = 15389

c. **Maximum stock level** = re-order level + re-ordering quantity- (Minimum usage * minimum lead time)

   = 24621.4+6155-(615.53*10) = 24521.1

d. **Danger level** = Average usage * Maximum re-order period for emergency purchases

   = 615.53*20 = 12310.6

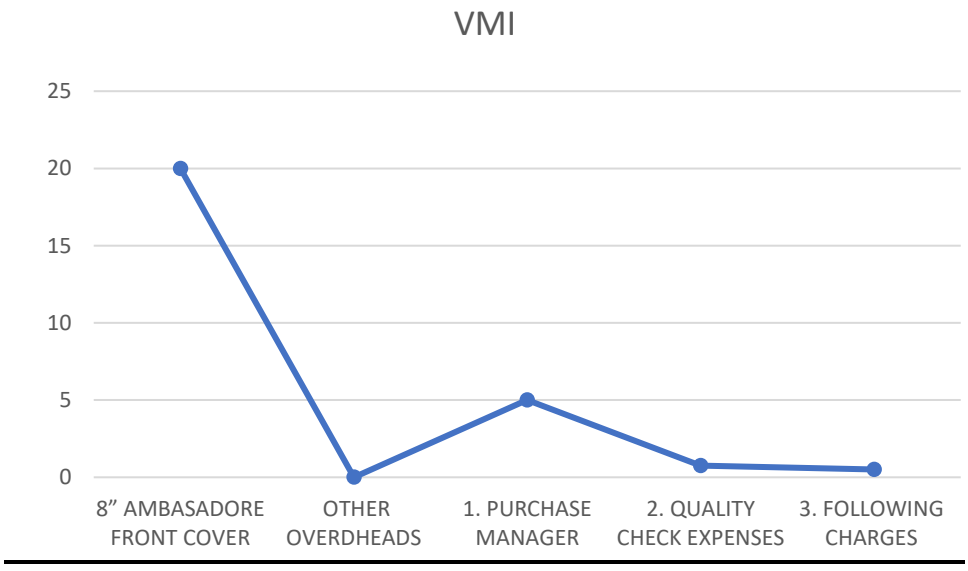
e. **Average stock level** = ½(Minimum stock level + Maximum stock level)

   = 15389+24521.1/2 = 27649.55

6.10.Comparative study of Vendor Management Inventory

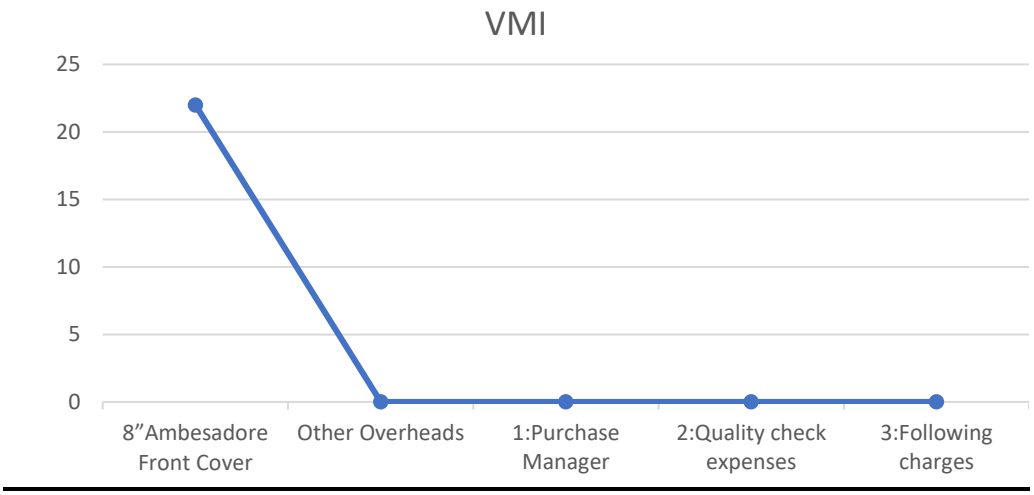
Before Using VMI (2017

Product Name	Cost of The Product (Rs.)
8” AMBASADORE FRONT COVER	20.00
OTHER OVERDHEADS	
1. PURCHASE MANAGER	05.00
2. QUALITY CHECK EXPENSES	00.75
3. FOLLOWING CHARGES	00.50
TOTAL	26.25



After using VMI

PRODUCT NAME	COST OF THE PRODUCT
8”Ambesadore Front Cover	22.00
Other Overheads	
1:Purchase Manager	00.00
2:Quality check expenses	00.00
3:Following charges	00.00
TOTAL	**22.00**



INTEREPRETATION:

Mahindra Sona when used the VMI that held very useful for the cost cutting. The VMI the vendor used to see the cost which are as follows purchase manager, quality check expenses, following charges, their expenses cost being reduced this lead to the increase in company profit which is helpful for the company for its flourish dement and use the profit for the company different uses.

After using the VMI the company uses to tell the vendor the daily requirement of the product with them. Which helps the company to buy a limited stock for the company this helps for the company? The vendor use to daily survey for the product need for the raw material which the company need this helps in cost cutting and it’s benefited for the company profit. This was not there before VMI the interest was not reduced we can also say that interest leads to zero.

In VMI the company fix the quality of raw material to the vendor and vendor supply the raw material according to quality specify by the company and because of this rejection of the raw material because of poor quality is less and it is useful to the company through the company without interruption

6.11.COMPARATIVE STUDY OF JUST IN TIME

Before using Just in time (before 2017)

Sr.	Description	Value per unit	Order Quantity	Amt
1	91/8’ spring (regular)	35	60000	2100000
2	91/8’&10 facing rivit	3	360000	1080000
3	91/8’ reg hub	80	10000	800000
4	91/8’ front cover	20	10000	200000
5	91/8’ rear cover	17	20000	340000

Consumption	Stand by	Total amt of stand by	18% int. for! Month	Total value of capital investment
40000	20000	700000	10500	710500
300000	60000	180000	2700	182700
8000	2000	160000	2400	162400
7000	3000	90000	1350	91350

Interpretation:

In Mahindra Sona limited before using JIT the company had procured the amount more than their requirement they had to suffer from blockage of capital. For example before the JIT company procured the raw material quantity of 60,000 units of Rs. 21,00,000.And the total consumption was 40,000 units and 20,000 units was left due to under consumption it was excess quantity than the required 20,000 quantity was costing of rupees 7.00.000 it lead to unnecessary blockage of capital. It also has the interest of 18% for a one month costing rupees 10,500 the total value of interest in rupees is 7,10,500 if there would be now blockage of fund than the company would have invested that amount in other sources for the company welfare or in production purpose it was passed scenario when the company was not using the JIT.

After using Just in time (After 2017)

Sr.	Description	Value per unit	Order Quantity	Amt
1	91/8’ spring (regular)	35	40000	140000
2	91/8’&10 facing rivet	3	300000	900000
3	91/8’ reg hub	80	8000	160000
4	91/8’ front cover	20	7000	140000
5	91/8’ rear cover	17	18000	306000

Consumption	Stand by	Total amt of stand by	18% int. for! Month	Total value of capital investment
40000	0	0	0	0
300000	0	0	0	0
8000	0	0	0	0
7000	0	0	0	0
18000	0	0	0	0

Interpretation:

When the company started using JIT in the year 2017 the amount of procurement of a raw material 91/8’ spring regular the value requirement of 40,000 quantity the amount in rupees 14,00,000 the total consumption is of 40,000 quantity only the procurement of a raw material is equal to total required quantity for the production so there is no excess amount of raw material.

After using JIT the company have no blockage of capital and no standby amount and no interest on amount. The company can use the capital for their sources.

Before the JIT company use to purchase raw material more than requirement that is if the raw material for the 40,000 was required company use the purchase for 60,000 quantity. Because of this raw material was remaining unused and hence company capital in the form of raw material was being blockade. Moreover company has to pay interest for that. Overall the company was suffering from unwanted loss of capital which cannot be undertaken.

Chapter No. 7

FINDINGS

7. FINDINGS

- The company is having good sales for their products during all the years of the study.

- The inventory turnover ratio is on a declining trend year after year in the period of the study. It indicates inefficiency of management in turning of their inventory into sales.

- The company uses the Re Order level method, just in time, Vendor Management, Economic Quality Control Company for inventory control.

- The inventory turnover ratio in the year 2013 was lowest which was 17.25 times and in 2017 it was highest that is 41.21

- Raw material in year 2014-15 was increase which was 2031.85 and it decrease in 2017 that is1768.52.

- Stock in process in year 2014-16 was maintained and in 2017 it is Nil.

- Comparative study of just in time & vendor managed inventory for inventory control.

Chapter No. 8

CONCLUSIONS

8. CONCLUSIONS

Inventory management has to do with keeping accurate records of finished goods that are ready for shipment. This often means posting the production of newly completed goods to the inventory totals as well as subtracting the most recent shipments of finished goods to buyers. When the company has a return policy in place, there is usually a sub-category contained in the finished goods inventory to account for any returned goods that are reclassified or second grade quality. Accurately maintaining figures on the finished goods inventory makes it possible to quickly convey information to sales personnel as to what is available and ready for shipment at any given time.

Inventory management is important for keeping costs down, while meeting regulation. Supply and demand is a delicate balance, and inventory management hopes to ensure that the balance is undisturbed. Highly trained Inventory management and high-quality software will help make Inventory management a success. The ROI of Inventory management will be seen in the forms of increased revenue and profits, positive employee atmosphere, and on overall increase of customer satisfaction.

Chapter No. 9

RECOMMEDATION

9. RECOMMEDATION

- The EOQ calculated is suggesting that the company should obtain its inventory requirements by placing orders frequently to its suppliers rather than one time replenishment.
- Company should take measures for maintenance of proper stores and spares so as to avoid the frequent breakdown of the machinery.
- The company should follows Just-in-Time technique, theirby it can do away with waiting time for a receipt of materials.
- The company should adopt sophisticated techniques to manage its inventory in a better manner.

CHAPTER.NO.11

BIBILOGRAPHY

10. BIBILOGRAPHY

Referred following standard text and websites:

- I.M. Pandey (2015), Financial Management ,Vikas Publishing House.
- Prasanna Chandra (2011), Financial Management , McGraw Hill Education.
- Van Horn (2008), Financial Management , Pearson.
- Khan & Jain (2007), Financial Management ,Tata MC Graw-Hill Education

Website:

- www.mahindrasona.com