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Research Paper | Management

A Study on Inventory Management at Amara Raja Electronics Ltd, Tirupati

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ABSTRACT

In any organization the inventory of materials plays vital role in working capital management. A small saving in the inventory will reflect a vital margin in profit of the organization. Inventory control means the availability of right materials of right quantities coordinated with lead time. Each and every component of inventory is important and managing the inventories to keep in an optimum level is a must. Being an auto ancillary industry IPPL is facing a stiff competition in the market. Since inventory is the major part of their cost of production there is a need for inventory control by way of reducing cost and optimum utilization of materials. Though the company is having certain policies regarding this, still it requires through study of their policy and systems to some extent to understand the inventory management.

- *The import components are contributing nearly 25% of the total production cost. The present order quantity is very high with some items which cause the problem of over stocking. This leads to additional carrying cost*
- *Holding of stock is very high level*

Due to confidentiality of the data and year ending constraint IPPL ltd. the researcher could not able to collect the required data required for this study. As the company is a closely held one and its policy of disclosing data to the outsiders is restricted. Hence the collection of full fledged data could not be achieved.

KEYWORDS : Material, stock, cost, Production

Introduction:

Management must be concerned with all aspects of the firms operations including production of goods, delivery of services, sales, marketing activities and supporting functions, such as personal training and data processing to handle these responsibilities most firms make extensive use of financial data and reports. As businesses become larger and more complex finance assumed the responsibility of dealing with problems and decisions associate with managing firm's assets.

Inventory in wider sense, is defined as any idle resource of an enterprise. It is a physical stock of goods kept dept for the purpose of future affairs. The term is generally used to indicate raw materials in process, finished products, packing, spares and others – stocked in order to meet expected demand or distribution in the future. Though inventory of materials is an idle resource –it is not meant for immediate use – it is almost essential to maintain some inventories for the smooth functioning of an enterprise.

Inventories constitute the major element in the working capital of many business enterprises. Inventories constitute the most significant part of current assets of large majority of companies in India. On an average, inventories are approximately 60 % of current assets in public limited companies in India. Because of the large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is impossible for a company reduces its levels of inventories to a considerable degree, e.g., 10- 20 %, without any adverse effect on production and sales, by using simple inventory planning and control techniques. The reduction in excessive inventories carries a favorable impact on a company's profitability.

➢ **Meaning of Inventory:**

- Inventory is a tangible property held for sale, or materials used in a production process to make a product.
- The dictionary meaning of inventory is 'stock of goods or a list of goods.

Inventory management involves the control of assets being produced for the purpose of sale in the normal course of the company's operations. Inventories are stock of the product a company is manufacturing for sale and components that make a product. The various forms in which inventories exist in a manufacturing company are:

- Raw materials
- Work in process
- Finished goods

Raw materails:-

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:-

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

Finished goods:-

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

Need for the study:-

- ❖ Every organization needs inventory for smooth running of its activities.
- ❖ It serves as a link between production and distribution processes.
- ❖ The investment in inventories constitutes the most significant part of current assets or working capital in most of the organizations.
- ❖ The purpose of inventory management is to ensure availability of materials in sufficient quantity as and when required and also to minimize investment on inventories.

Objectives:-

- To know the inventory turnover ratio of AREL.
- To know the financial performance on inventory at the Organization.
- To calculate the Economic Order Quantity for each raw material at organization.
- To study of the effective utilization of inventory by using ABC Analysis.

Research methodology:-

The study was conducted to know the position of inventory management. In every enterprise needs inventory for smooth running of its activities. It's served as a like between production and distribution process. There is a time leg between the recognition of need and its fulfillment. The greater the time lags the time lag, the higher the requirements. The secondary data was collected from annual reports, schedules, stores ledgers, budgets and purchase orders.

Some for inventory control techniques are

- ABC Analysis
- EOQ
- FSN
- Ratio analysis

ABC Analysis:-

ABC Analysis is an important factor in controlling the inventory. It is very effective and useful tool for classifying monitoring and control of inventories. The firm should not keep same degree of control on all the items of inventory. It is based on paretols law; It is also known as selective inventory control. The firm should put maximum control on those items whose value is the highest, with the comparison of the other two items. The technique concentrates on important items and also known as control by importance and exception usually a firm has to maintain several types of inventories for proper control of they firm should have to classify inventories in the instance of their relative value. Hence it is also known as "proportional value analysis".

Classification of A, B &C Items:-

CLASS	NO. OF ITEMS	VALUE OF ITEMS (X)
A	10	70
B	20	20
C	70	10

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

Where, A = Annual usage

C = Carrying cost per unit

O = Ordering cost per unit

The above formula will not be sufficient to determine EOQ when more complex cost equations are involved. EOQ applicable both the single items and to any group of stock items with similar holding and ordering costs. Its use causes the sum of the two costs to be lower than under any other system of replenishment.

- **Ratio analysis:-**

The ratio analysis is one of the most powerful tools of financial analysis. It is the process of establishing and interpreting various ratios. It is with the help of ratios that the inventory management can be analyzed. More clearly and decision made from such analysis. Following ratios are used in the study.

1. Inventory Turnover Ratio

a) Raw Materials Turnover Ratio
b) Work-In-Progress Turnover Ratio
c) Finished Goods Turnover Ratio
d) Inventory Conversion Period.

1. INVENTORY TURNOVER RATIO:

Inventory turnover ratio is a ratio that establishes the relationship between cost of sales and average inventory. It indicates whether the investment in inventory is within proper limit or not.

$$\text{Inventory Turnover Ratio} = \frac{\text{Sales (or) Cost of goods sold}}{\text{Average inventory}}$$

$$\text{Average inventory} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

a) RAW MATERIALS TURNOVER RATIO:

$$\text{Raw Materials Turnover Ratio} = \frac{\text{Raw Materials Consumed}}{\text{Average stock of raw materials}}$$

b) WORK IN PROGRESS TURNOVER RATIO:

$$\text{Work In Progress Turnover Ratio} = \frac{\text{Cost of goods manufacture}}{\text{Average stock of work in progress}}$$

c) FINISHED GOODS TURNOVER RATIO:

$$\text{Finished Goods Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average finished goods}}$$

d) INVENTORY CONVERSION PERIOD:

Inventory conversion period may be interest to see time to taken for clearing the goods.

$$\text{Inventory Conversion Period} = \frac{\text{Days in a year}}{\text{Inventory Turnover Ratio}}$$

Data analysis and interpretation

Ratio Analysis:

Raw Material turnover ratio:

YEARS	RAW MATERIAL CONSUMED IN(RS)	AVERAGE RAW MATERIAL IN(RS)	RATIO VALUE
2008-2009	509183801	85907382	5.92
2009-2010	550106970	117229259	4.70
2010-2011	517617065	146156947	3.54
2011-2012	544971829	103287064	5.27

Interpretation: In the above graph indicates that raw materials turnover ratio is 5.92 times in the year 2008-09 and it is decreased to 4.70 in the year 2009-10 and also it is decreased in the next year i.e. 2010-11 to 3.54.Then it is increase to 5.27 in the year 2011-12.It can be conclude that raw materials turnover ratio has improved even with increase requirement of raw materials and business volatilities**.**

Work in process turnover ratio:

YEARS	COST OF GOODS MANUFACTURE IN(RS)	AVERAGE WORK IN PROCESS IN(RS)	RATIO VALUE
2008-2009	5122143	-	-
2009-2010	5876628	22036	266.68
2010-2011	10953632	124693	87.88
2011-2012	11426915	157501	72.55

Interpretation:

In the above graph indicates that the work in process turnover ratio It was 266.68 times in 2010.Because in the year opening and closing work in process is very less and high of manufacturing expenses and 87.88 times in 2011 and72.55 times in 2012.Then no opening work in process for the year 2009.Thats why we can't determine work in process turnover ratio for that year.

Finished goods turnover ratio:

YEARS	COST OF GOODS SOLD IN(RS)	AVERAGE FINISHED GOODS IN(RS)	RATIO VALUE
2008-2009	734143587	22532353	32.58
2009-2010	769092729	22723051	33.84
2010-2011	1195311562	36026032	33.17
2011-2012	1342948164	38690853	43.70

Interpretation:

In the above diagram shows the finished goods turnover ratio is 32.58 times in the year 2008-09 and it is increased 33.84 in the year 2009-10. Then it is decreased to 33.17 in the year 2010-11 again it is increased to 34.70 in the year 2011-12.It can be conclude that finished goods turnover ratio has slightly changes in four years

Inventory turnover ratio:

YEARS	COST OF GOODS SOLD IN(RS)	AVERAGE INVENTORIES IN(RS)	RATIO VALUE
2008-2009	734143587	110975635	6.61
2009-2010	769092729	208870134	3.69
2010-2011	1195311562	269080004	4.44
2011-2012	1342948164	284658502	4.71

Interpretation:
In the above diagram shows the inventory turnover ratio is 6.61 times in the year 2008-09 and it is decreased 3.69 in the year 2009-10.Then it is increased to 4.44 in the year 2010-11 again it is increased to 4.7 in the year 2011-12.It can be conclude that inventory turnover ratio has decreased first and then increased last two years.

Inventory conversion period:

YEARS	DAYS IN A YEAR	INVENTORY TURNOVER RATIO	CONVERSION PERIOD IN DAYS
2008-2009	365	6.61	55
2009-2010	365	3.69	98
2010-2011	365	4.44	82
2011-2012	365	4.71	77

Interpretation:
The above graph shows inventory conversion period. It was 55 days, 98 days,82 days,77 days from 2009 to 2012.It increased 55 to 98 from 2009 to 2010 then it is decreased following years. It indicates the payment period to suppliers was decreased**.**

Trend analysis:

YEARS	INVENTORY IN(RS)	PERCENTAGE OF INVENTORY
2008-2009	126816050	19.50
2009-2010	164108168	25.23
2010-2011	209943671	32.29
2011-2012	149429661	22.98
Total	650297550	100

Interpretation:
The above graph shows the trend analysis. The percentage of inventory increases from 2009 to 2011 from19.50 to 32.29 based on previous year's inventory position. And last year 2012 inventory decreased compare to previous year i.e. 2011 to 2012 from 32.29 to 22.98.

ABC Classification (2008-2009):

ITEM	NO. OF ITEMS	% OF ITEMS	CONSUMED VALUE	% OF VALUE
A	193	5.92	367427030.8	72.16
B	543	16.67	92722370.16	18.21
C	2521	77.41	49034400.04	9.63
Total	3257	100	509183801	100

Interpretation:
The above graph shows the ABC analysis for the year 2009.A, B, C items are shown into two ways based on its percentage of total items and total consumed value. The A items are less but it's consumption value is more (5.92-72.16)C items are more but it's consumption value is low (77.41-9.63), B class items are moderate on its percentages(16.67-18.21).The consumption value is above the norms 70% A items to concentrate more.

ABC Classification (2009-2010):

ITEM	NO. OF ITEMS	% OF ITEMS	CONSUMED VALUE	% OF VALUE
A	159	4.59	388320510.1	70.59
B	586	16.94	109141222.8	19.84
C	2715	78.47	5264523703	9.57
Total	3460	100	550106970	100

Interpretation:
The above graph shows the ABC analysis for the year 2010.A, B, C items are shown into two ways based on its percentage of total items and total consumed value. The A items are less but it's consumption value is more (4.57-70.59)C items are more but it's consumption value is low (78.47-9.57), B class items are moderate on its percentages(16.94-19.84).

ABC Classification (2010-2011):

ITEM	NO. OF ITEMS	% OF ITEMS	CONSUMED VALUE	% OF VALUE
A	201	5.50	380345019.4	73.48
B	612	16.80	93792212.8	18.12
C	2835	77.70	43479833.4	8.4
Total	3648	100	517617065	100

Interpretation:
The above graph shows the ABC analysis for the year 2010.A, B, C items are shown into two ways based on its percentage of total items and total consumed value. The A items are less but it's consumption value is more (5.50-73.48)C items are more but it's consumption value is low (77.70-8.4), B class items are moderate on its percentages(16.80-18.12).

ABC Classification(2011-2012):

ITEM	NO. OF ITEMS	% OF ITEMS	CONSUMED VALUE	% OF VALUE
A	253	6.61	407584430.9	74.79
B	670	17.51	95043086.98	17.44
C	2905	75.94	42344311.11	7.77
Total	3825	100	544971829	100

Interpretation:
The above graph shows the ABC analysis for the year 2010.A, B, C items are shown into two ways based on its percentage of total items and total consumed value. The A items are less but it's consumption value is more (6.61-74.79)C items are more but it's consumption value is low (75.94-7.77), B class items are moderate on its percentages(17.51-17.44).

Findings:

- It decreased 4.44 in the year 2011 and then it increased 4.71 times in2012. These shows sales the inventory turnover ratio was 6.61 times in the year 2009.Then it decreased 3.69 times in 2010, after increased in last two years compare to 2010.
- The work in process turnover ratio in the year 2010, 266.68 times and 2011, 87.88 and2012, and 72.55.there is no closing and opening work in process in the year 2008-2009.so we can't determine that year. In the year 2010 the cost of goods manufacture very high and average inventory is very low.
- The finished goods turnover ratio increased 34.70 times in the year 2011-12, compare to the year 2008-09, 32.08 times. It indicates the having strong sales.
- The inventory conversion period was 55 times in 2009,98 times in 2010,82 times in 2011 and 77times in 2012.It is increased from the year 2009to2010 and then it decreased from2010 to2012, it indicates the payments to the suppliers was fast.
- In the trend analysis the percentage of inventories increases from 2009-2011 i.e. 19.50 to 32.29.Then it decreased to 22.98 in the year 2012, compare to 2011.
- The 'A' class items in 2012(74.79%) where eventually increased, compare year 2009(72.16%), this indicates the organization most concentrate on 'A' class items.
- The 'C' class items every increases, but it's consumption value decreased from 2009 to 2012 i.e. 9.63 to 7.77.

Conclusion:
Inventory management is an important activity in Manufacturing Concern. And since the production of batteries Involves different raw materials like lead, Alloy, separators, etc., and all these raw materials have to be procured from different places, inventory management plays important role in the industry. As far as ARBL is concerned, a proper maintenance of EOQ, availability of stocks, procurement of raw materials. When the company has to concentrate more in the inventory management, so that the production may increase and the level of

shortage decreases and the products as made reality available to the customers. The company can also consider the suggestions and recommendations, which are actually based on the analysis made, for the battlement of the company. By following the Inventory Management Technique like JUST IN TIME (JIT), the company can reduce it cost and supplies to finish the goods at reasonable prices to the customer. The company by strictly following management techniques like EOQ, ABC Analysis can increase its profits.

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