

Inventory Management

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ABSTRACT

This project analyzes the inventory management practices of Bharat Heavy Electricals Limited (BHEL), a leading public sector engineering and manufacturing enterprise in India. Effective inventory management is crucial in large-scale manufacturing organizations like BHEL to minimize holding costs, avoid stockouts, and ensure smooth production cycles. The study aims to evaluate how BHEL manages its inventory levels, procurement processes, and material planning to optimize operational efficiency and cost-effectiveness. Using data from annual reports, supply chain records, and relevant financial documents, the project examines key aspects such as inventory turnover ratio, Economic Order Quantity (EOQ), Just-In-Time (JIT) practices, and classification of inventory (raw materials, work-in-progress, and finished goods). The analysis highlights BHEL's challenges in managing large and diverse inventory due to its complex project-based operations and long production cycles. However, it also identifies strategic initiatives taken by the company to improve material planning, implement automation, and reduce excess stock. The study concludes that while BHEL has a robust inventory management framework, there is potential for further optimization through modern technologies like ERP and data analytics.

KEYWORDS: Inventory management, BHEL, supply chain, inventory turnover, EOQ, JIT, raw materials, work-in-progress, finished goods, manufacturing efficiency, cost control.

1. INTRODUCTION

Inventory management is a vital component of operational efficiency in any manufacturing organization, especially in large-scale, capital-intensive industries such as power equipment manufacturing. Bharat Heavy Electricals Limited (BHEL), a leading public sector enterprise in India, plays a critical role in the power generation and engineering sector. Given the scale and complexity of its operations, effective inventory management is essential to ensure uninterrupted production, cost control, and timely project execution.

This study aims to explore the inventory management practices adopted by BHEL, focusing on how it handles procurement, storage, classification, and utilization of inventory items. The goal is to analyze the systems in place for managing raw materials, work-in-progress (WIP), and finished goods, while also identifying potential inefficiencies and areas for improvement.

Techniques such as Economic Order Quantity (EOQ), Just-In-Time (JIT), ABC analysis, and inventory turnover ratios will be examined to evaluate BHEL's approach to optimizing inventory levels. The importance of aligning inventory strategies with overall business goals—such as reducing costs, improving cash flow, and enhancing customer

satisfaction—will also be highlighted. The study is supported by data from BHEL's annual reports and secondary research, providing a practical perspective on inventory management in a large industrial organization.

2. RESEARCH METHODOLOGY

The research methodology adopted for this study on inventory management with respect to Bharat Heavy Electricals Limited (BHEL) is both analytical and descriptive in nature. The primary objective is to evaluate the efficiency of BHEL's inventory management practices and identify areas for improvement.

1. Research Design:

The study follows a **descriptive research design**, aiming to provide a detailed analysis of BHEL's current inventory management system, its procedures, and performance metrics.

2. Data Collection:

Secondary Data: The research is primarily based on secondary data collected from BHEL's official annual reports, inventory records, audit reports, company publications, journal articles, government websites, and supply chain-related publications.

Literature Review: Academic books and research papers related to inventory management concepts such as EOQ, JIT, ABC analysis, and inventory turnover ratios are reviewed to support theoretical understanding.

3. Tools of Analysis:

Ratio Analysis (e.g., Inventory Turnover Ratio)

ABC Analysis (for inventory categorization)

Trend Analysis (to observe inventory performance over time)

Comparative Analysis (with industry benchmarks)

3. Scope and Limitations:

The study focuses on BHEL's inventory practices in manufacturing units and may not fully reflect practices in smaller project sites or temporary storage units. The analysis is based on publicly available data, and no primary survey or interviews were conducted.

4. DATA ANALYSIS

Calculated of the loading vehicle as 500 units.

Normal Daily consumption = 700 units

Normal Reorder period = 4.5 weeks

Reorder level = 4500 units

Minimum usage = 500 units

Minimum Reorder period = 4 weeks

Maximum Reorder period = 5 weeks

MINIMUMSTOCKLEVEL

= Reorder Level- (Normal consumption X Normal Reorder Period)
 = 4500-(700X4.5)
 = 4500-3150
 = 1350Units

MAXIMUMSTOCKLEVEL

=Reorder Level + Reorder Quantity-(Minimum consumption X MinimumReorderPeriod)
 = 4500+2500-(500X4)
 = 7000-2000
 = 5000Units

AVERAGESTOCKLEVEL

= Minimumstock+½ofReorderingQuantity.
 = 500+(½X2500)
 = 500+1250
 = 1750Units

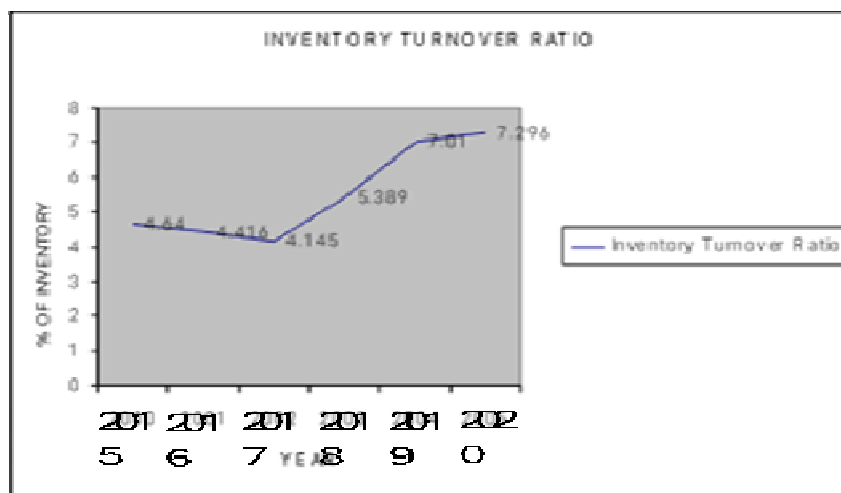
INVENTORYTURNOVERRATIO

YEARS	2020	2019	2018	2017	2016	2015
Opening Inventory (Rs. In Lakhs)	49970	45675	46904	55253	51554	43697
Closing Inventory (Rs. In Lakhs)	75983	49970	45675	46904	55253	51554

INVENTORYTURNOVERRATIO

YEARS	INVENTORY CONSUMED (Rs.in Lakhs)	AVERAGE INVENTORY (Rs.in Lakhs)	INVENTORY TURNOVER RATIO	INVENTORY TURNOVER INNUMBER OFDAYS
March -2020	459537.10	$\frac{49970 + 75983}{2} = 62976.5$	$\frac{459537.10}{62976.5} = 7.296$	$\frac{365}{7.296} = 50.027$
March -2019	335286.52	$\frac{45675 + 49970}{2} = 47822.5$	$\frac{335286.52}{47822.5} = 7.01$	$\frac{365}{7.01} = 52.21$
March -2018	250021.84	$\frac{46904 + 45675}{2} = 46389.5$	$\frac{250021.84}{46389.5} = 5.389$	$\frac{365}{5.389} = 67.73$
March -2017	211723.1	$\frac{55253 + 45904}{2} = 51078.5$	$\frac{211723.1}{51078.5} = 4.145$	$\frac{365}{4.24} = 88.05$
March -2016	235858.13	$\frac{51554 + 55253}{2} = 53403.5$	$\frac{235858.13}{53403.5} = 4.416$	$\frac{365}{4.41} = 82.65$
March -2015	221023.23	$\frac{53597 + 51554}{2} = 47625.5$	$\frac{221023.23}{47625.5} = 4.64$	$\frac{365}{4.64} = 78.87$

Table-6 2015



INVENTORY TURNOVER RATIO

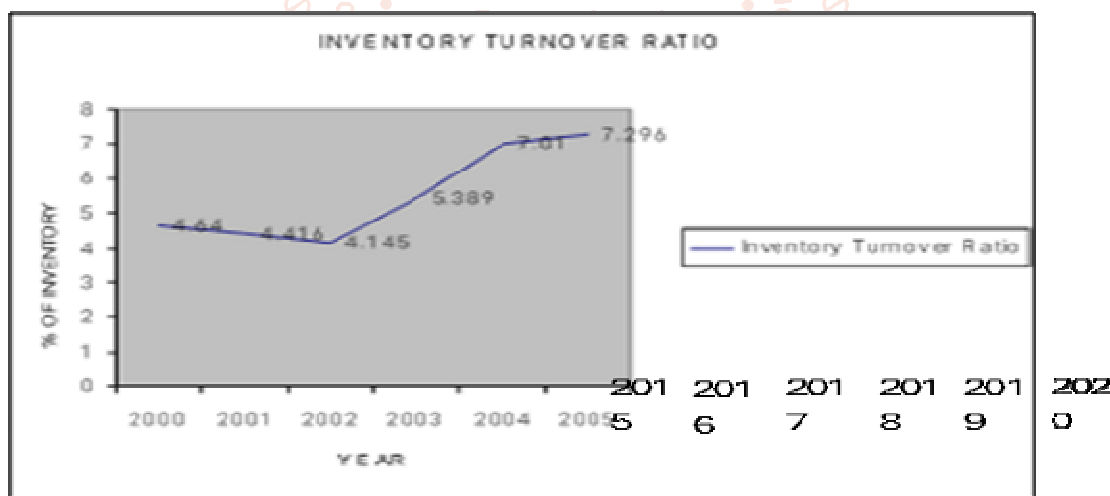
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Table-5

INVENTORY TURNOVER RATIO

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5. CONCLUSION

The study on inventory management at Bharat Heavy Electricals Limited (BHEL) highlights the critical role of effective inventory control in the operational success of a large-scale manufacturing enterprise. As a capital-intensive company dealing with complex engineering projects and long production cycles, BHEL faces unique challenges in managing its inventory efficiently. The analysis reveals that while BHEL has implemented structured inventory systems and policies—including classification methods like ABC analysis and standard practices like EOQ—it continues to

encounter issues such as overstocking, long lead times, and the risk of obsolete inventory.

Despite these challenges, BHEL has made commendable efforts to streamline inventory management through automation, ERP integration, and improved material planning. Inventory turnover ratios and other performance metrics indicate a reasonable level of control, though there is scope for enhancement through real-time data analysis, just-in-time procurement, and tighter supplier coordination.

In conclusion, BHEL's inventory management framework is strong but evolving. To remain competitive and cost-efficient, the company must continue adopting advanced technologies and data-driven strategies. Efficient inventory management will not only reduce operational costs but also improve production efficiency, customer satisfaction, and overall organizational performance.

6. REFERENCES

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