CHAPTER – II
REVIEW OF RELATED LITERATURE

Introduction

There are several studies conducted in the areas of production, operations and material management. The material management is one of the important stages in the manufacturing process, supply of goods and service delivery. It also plays critical roles in the quality of service and delight of the consumers. In the back drop of the Chapter 1, the investigator had focused on the review of the relevant literature and presented the brief account earlier studies on material management in Chapter 2. The review of literature lead the investigator to design research methodology and the details of the same also included in the present Chapter. Thus the Chapter 2 presented with two parts – (1) Review of related literature and (2) Methodology followed in the study.

Part: 1 - Review of Related Literature

Review of Literature

Research in the area of materials management both at the Macro and the Micro levels remains conspicuously absent in India as adequate indigenous literature is not available on this subject. However, of late, on account of its growing importance, few research studies have been conducted at various universities in our country which highlight some of the problems faced by the selected central and the state public sector undertakings. Apart from the above research work, few Studies Conducted by Administrative Staff College of India, Hyderabad and by some individual authors focus attention on the existing
policies, procedures and problems of industrial organizations in the field of materials management. Besides the above studies, there are a number of reports submitted by governmental committees from time to time particularly on inventory management in India.

**Bansal**\(^{(1)}\) in his study on Materials Management: A case Study of Bharat Heavy Electricals Limited, Bhopal Unit, (BHEL), has evaluated the existing systems of inventory management. He emphasises.

The need for automatic replenishment system in the undertaking offer studying the application of ABC analysis and EOQ technique of inventory control. He also points out the accumulation of surplus stores and non-moving items in the organization and recommends that the surplus and absolute stores which are no longer required should be disposed off as early as possible at the best available price. Further, he suggests the preparation of monthly class wise statements on inventories for effective control over them and the introduction of reconciliation system of stores ledgers with account ledgers to avoid misappropriation of stores, and spares for production and operation are above their actual consumption level. The inventories in general are found to be above their routine requirements. The holdings of stores and spares corresponding to two to three years requirements should be considered excess.

**Sambasiva Rao. K**\(^{(2)}\) In his Study on Materials Management in Public Sector Ship Building Industry evaluates. The performance of materials management and identifies some problems faced by materials management in the heavy engineering industry. The method of investigation involves the
documentary evidence and survey of expert opinion. He evaluates the existing purchase systems and lead time involved in procurement of materials and suggests that the long lead time should be reduced. His study points at the excess inventory in terms of number of months cost of production in all the engineering units. He also highlights some of the problems in the area of materials management such as delay on the part of customers in supplying their own materials, existence and disposal of surplus and non-moving items, excessive lead times and excessive dependence on imports. According to him the administrative and procurement lead times of the company are on the higher side due to the peculiar nature of the industry. He suggests liberalized purchase procedures, increased financial powers to the personnel, Opening up of liaison offices in various countries to reduce the lead time.

Phaniswara Raju\(^{(3)}\) has conducted a research study on materials management in Andhra Pradesh State Road Transport Corporation (APSRTC) in 2006. In his study, he examines the materials management practices and purchasing systems in APSRTC on the basis of various parameters like material consumption per vehicle, material consumption per kilometer, inventory per vehicle, inventory in terms of number of months consumption etc. He highlights some major problems in the procurement of materials. The study is primarily based on the secondary data collected from the published annual reports of APSRTC, the records of MIS, the reports on performance of National Road Transport Undertakings of CIRT, Pune etc., In addition to the personal discussions held with various officials of the corporation. The study reveals the increasing levels of materials consumption in APSRTC. As compared to other
undertakings. The study points to the absence of the use of important analytical techniques like value analysis and network techniques in the purchasing system of APSRTC.

The inventory control system in APSRTC is critically examined in respect of stock out pattern, reordering and review policies, Lead time patterns, stock out levels etc. He suggests the reclassification of stores stems based on the criticality, the refixation of reorder level and reorder quantities. The study has also indicated the wastage caused by maintenance of unnecessary stock records relating to stems which are not in use.

Hari R. Swami\(^4\) in his research work materials management in public undertakings evaluates the performance of materials management in the central public undertakings in Rajasthan Viz., Instrumentation Limited, Kota Unit, HMT, Ajmer Unit, Hindustan Zinc Limited, Debari Unit, Hindustan Copper Limited, Khetri Unit and Sambhar salts limited. The study covers various aspects of materials management in these enterprises from 1977-78 to 1981-82. The methods of investigation includes questionnaire interview, on the spot study and desk work techniques etc. It is observed that the cost of materials accounts for more than 50 percent of the total cost of production in the selected units of the study. The importance of proper materials management has not been fully realized by the public undertakings in Rajasthan and very little attention has so far been paid to the task of controlling investment in inventories through the application of various scientific techniques of materials management. The researcher expresses the view that materials management should not cover the inspection function and that an autonomous and independent cell be created in
the organization for this purpose. The study reveals that the lead time in the selected public enterprises is considerably long and suggests reduction of administrative lead time by expediting purchase matters. The study also reveals that the inventory of selected public enterprises has accumulated due to faulty purchases, heavy rejections, long lead time, in-cohesive organization, non-adoption of scientific and modern techniques of materials management and defective inventory control. He suggests that the inventory holdings could be reduced by adopting an integrated system of materials management, appointing qualified and trained inventory managers, reducing lead time, setting and regulating consumption and stocking norms of raw materials and other goods, applying modern techniques of materials management and identifying slow and non-moving items. He concludes that the public enterprises had suffered losses or earned low level of profits due to the inefficient management of materials. Had public enterprises followed standard techniques of materials management, they would have generated adequate resource for their own expansion and increased production resulting in more profits.

Apart from the above research studies, proving the growing awareness of the subject, some studies are also conducted in the area of materials and inventory management focusing attention on the existing policies, procedures and problems. There are also some text books viz: **Rationalising Materials Management**\(^{(5)}\), **Essentials of Materials Management: Text and Cases**\(^{(6)}\), **Materials Management: Procedures Text and Cases**\(^{(7)}\), **Management of Materials**\(^{(8)}\), **Materials Management**\(^{(9)}\), **Materials Management: An Integrated Approach**\(^{(10)}\), Integrated Materials.
Management\textsuperscript{(11)}, Materials Management\textsuperscript{(12)}, An integrated concept of Materials Management\textsuperscript{(13)}. These books deal mainly with the functions, procedures and problems in the area of Materials Management and caters to the needs of students, researchers and professionals dealing with the subject. However, in some text books, some typical and useful case studies are discussed at length for the benefit of the readers.

There are also some text books exclusively on the inventory management such as Inventory Management in India\textsuperscript{(14)}, Inventories in Indian manufacturing\textsuperscript{(15)}, Inventory Management\textsuperscript{(16)}, Purchasing and Inventory Control\textsuperscript{(17)}, Inventory Holding by manufacturers in India and united states\textsuperscript{(18)}, Working Capital Planning and Control\textsuperscript{(19)}, Problems of Working Capital\textsuperscript{(20)} and Management of Working Capital\textsuperscript{(21)}.

In all the books, an attempt is made by the respective authors to explain the concepts, importance, tools and techniques and problems of inventory management with some case studies. For instance, Krishna Murthy and Sastry studied inventory behaviour of 21 industries comprising 91 percent of output and 96 percent of inventories of the group of the industries covered by the causes of manufactures. The study deals only with inventory holdings of the manufacturers and the analysis in terms of the prices prevailed during the study period.

Similarly, the IFMR’s survey “Inventory management summarises briefly the findings of four important surveys it conducted in the area of inventory management practices in the Indian industry. A study on control practices in Indian industry conducted by the faculty members of the Jamnalal Bajaj Institute
of Management Studies, University of Bombay concludes that most of the companies are still guided by rules of thumb and intuition in deciding on the capital to be invested in inventory. Of the 224 companies approached, 36 responded and among them only 13 reported using inventory control techniques. Only 6 out of the 13 companies took into account inventory costs in controlling inventories.

The study by the faculty members of the Administrative staff college of India on inventory management practices with a focus on the Tandon committee recommendations concerning inventory norms indicates that industries are found to carry, by and large, More stocks of raw materials including spare parts and imported items than the suggested norms of the committee. It has revealed that industries except in the engineering and the textile sectors are managing the work-in-progress inventory within the specified norms.

The IFMR conducted an empirical study on inventory management practices in public sector undertakings and public limited companies in the private sector in 1979 to highlight the range of problems of inventory management and to appreciate the value of techniques and practices adopted in the Indian context to tackle these problems. While it intended to cover two hundred or organizations, response is actually received only from 48 organisations of whom a majority gave high priority to inventory management. It also reveals that there is a considerable scope for reducing the spares inventory in the engineering and process industries. There is a general lack of appreciation of the benefits that accrue from the integrated materials management. Most of the respondents treated the materials management function as a service centre.
except for a few who conferred on it has status of a profit centre. In most instances there is a very strong case to elevate the materials management function and accord to it much higher status with close scrutiny from the top management.

In addition to this, there are a number of reports submitted to the Government from time to time. For instance, the committee on public undertakings in its 40th report\(^{(22)}\) points out the deficiencies in materials management in the public sector undertakings in India. The BPE\(^{(23)}\) issued guidelines on materials management to the public sector undertakings to introduce modern and for improving their materials management functions.

The administrative reforms commission\(^{(24)}\) has made some recommendations for reducing inventory levels. The RBI study group\(^{(25)}\) appointed to frame guidelines and to lay down norms for bank credit applicable to all classes of industrial borrowers (popularly known as Tandon Committee Report), has classified inventories prescribing inventory norms for fifteen industries. The committee on inventory control\(^{(26)}\) appointed by Bureau of Public Enterprises (BPE) in 1972 examined inventories of the three public sector undertakings viz, Hindustan Shipyard Limited (HSL), Hindustan Cables Limited (HCL), National Mineral Development Corporation Limited (NMDCL). The committee fixed inventory levels for HSL and made some concrete recommendations to reduce inventory levels in all the three undertakings.

Apart from these research studies, there are a few famous journals on materials management published in India. Several experts in the field contribute
extensively to these journals from time to time on different aspects of materials management. Prem Virat\textsuperscript{(27)} highlights the importance of increasing materials productivity in Indian industries. Ravindra Kumar\textsuperscript{(28)} describes materials management as a truly creative, productive and profit centre Renuka Raja Gopalan\textsuperscript{(29)} stresses the importance of productivity through efficient materials management in manufacturing enterprises. Suresh Krishna\textsuperscript{(30)} advocates the need for professionalism in materials management to achieve the organizational goals. Krishna Swamy\textsuperscript{(31)} emphasises the need for maintaining good vendor relations. Somayajulu\textsuperscript{(32)} highlights an integrated view of the role of materials management in improving the profitability of the undertakings. Lal\textsuperscript{(33)} emphasises the need for proper planning and good inventory management systems in achieving organizational goals. According to Prasad\textsuperscript{(34)} the important areas in material function which have a direct and importance bearing on the productivity are purchasing, transportation, materials landing and disposal of obsolete surplus and waste products. Mukherjee\textsuperscript{(35)} expresses the view the material management would be a profit centre of great importance in industries where materials cost would correspond to 50 to 60 percent of the cost of production and where the entire working capital is in the form of inventory. According to Mahadavan\textsuperscript{(36)}, M&M is vital to corporate management in achieving the set goals and in constitutes one of the 5M’s of the corporate Sector viz. Marketing Management by sales man management by personnel, Money Management by Finance, Machine Management by Workers/ factory, M&M by materials. Gurani\textsuperscript{(37)} emphasises the need for cost reduction in the area of materials management by an efficient team work of all concerned in a well knit organization. Mahalamobis\textsuperscript{(38)} stresses the need for M&M in improving
productivity. He stresses the need for total materials control to achieve better results. Sreenath\(^{(39)}\) stresses the importance of the role of MM in the productivity of steel plants. He suggests regular interaction between MM groups, centralized procurement, extensive computerization etc., to improve the productivity of steel plants. Sarogi\(^{(40)}\) highlights the importance of modern MM in the present competitive market. The author discusses in detail the salient points to curb and control excess inventory, stressing the value of purchasing function. Chandramouli\(^{(41)}\) differentiates the MM function between engineering and processing industries and highlights the problems of MM in the process industry. Ramaswamy\(^{(42)}\) highlights the importance of MM function to contribute effectively to the productivity of the organization. Hans Busch\(^{(43)}\) regards the MM as a total concept involving organizational structure with a single responsibility to ensure the systematic flow and control of materials. He stresses the need for implementing modern concepts in MM. Madho Norain\(^{(44)}\) stresses the need to develop professional personality and other managerial virtues for the personnel working in the MM. Capoor\(^{(45)}\) feels that efficient MM could greatly contribute to the growth and profitability of an organization. He suggests maintenance of good relationship with the suppliers and to remove the fear complex of stock outs.

Rama Krishna Rao\(^{(46)}\) reviews the inventory position in the central public sector heavy engineering units and highlights the problems faced by the engineering units in particular and all the central public sector undertakings in general. Roy Chowdhury\(^{(47)}\) outlines some of the salient steps necessary for the development of research in the area of MM. Rao and Rao\(^{(48)}\) emphasis the need
for developing a constructive information system in the MM sphere to achieve good results.

Adisesh Lyer\(^{(49)}\) discusses the methods of valuing inventories and feels that the work-in-progress inventories be valued as per the cost accounts ledgers instead of physical valuation. Kulkarni\(^{(50)}\) discusses ABC analysis techniques at length. Pillai and Ashok Agrawal\(^{(51)}\) discusses the inventory management in the Indian Air Transport Industry and its weaknesses and suggests remedial measures for an efficient inventory management. Rao\(^{(52)}\) discussed the four costs viz., replenishment cost, inventory carrying cost, under stocking and overstocking costs in developing an inventor system. Gopalakrishna\(^{(53)}\) stresses the need for inventory control in view of the Tandon Committee norms and suggests some methods to control inventories. Gangadhara Rao and Rama Krishna Rao\(^{(54)}\) analyse the trends in inventory levels besides pointing out the causes for inventory accumulation in all the central public sector undertakings during the period.

Kulkarni\(^{(55)}\) highlights the problems of valuation of work-in-progress in the context of identification of materials and valuation. Rama Krishna Rao\(^{(56)}\) highlights the problems of inventory control in the public sector units and classifies the causes for inventory accumulation as internal and external. According to him, Unrealistic Government policies with regard to import licenses and erratic delivery schedules and long lead times are responsible for inventory accumulation in the public sector units. Rao and Gupta\(^{(57)}\) view that an effective management of inventories reduces the cost of production and consequently increases the profitability of the enterprise. The methods, Techniques,
procedures and systems suggested by various authors to control the inventories varied widely. There is no consensus as to the functions to be covered under the preview of MM. However, the MM has been identified as the most potential area of prime importance to increase the productivity and efficiency of an organization. The present study will therefore highlight the importance of the MM in BHPV.

**Gap of the Study**

It has been understood from discussion on the receive of earlier studies, there is no similar study on power distribution company which analysis about the material management where purchasing and distribution activities have been conducted.

Till now, the activities of materials management are attended by the staff manually. There is an absolute problem in assembling the centralized data for critical analysis and interpretation purpose. Hence, the larger objective of this study is the find way and means of computerization of all aspects centering around purchases, prices bidding, issues, flow of materials, stock verification etc.

Even though, there is no scientific method of estimating future requirements of materials and replacements. Hence it is suggested that material plan should take care things like obsolescence, replacements and future plans, so as to maintain important activity with greater care.

Prior to globalization one organization by name APSEB used to look after the generation, distribution and operation of energy sector throughout the state.
Since the state has accepted huge loans from the World Bank to invest on power sector in Andhra Pradesh.

Simhachalam Power Distributions came under APEPDCL. Since it is new and big establishment with 44 Mega Watts capacity to distribute power supply in north coastal Andhra Pradesh. Since it is a new incumbent its problems relating to materials are large enough to probe these areas for the present study purpose.

Since Simhachalam Power Distribution is a new incumbent into Andhra Pradesh Power Sector. Hence, an attempt has been made as material planning, waste, useless party along with material issues and control. Hence, this study emphasises computerization of all aspects relating to materials and control processes.

**Part: 2 - Methodology Followed in the Study**

**Methodology**

The method of investigation depends upon the purpose of the study. The present investigation aims at studying how the material management performed by the Simhachalam Power Distributors of the APTRANSCO in Visakhapatnam. It attempts to identify the relation between purchase of materials, issue of materials and cost of materials for the successful functioning of the unit. And the study analyses how the materials and managed by the unit.

The material management is totally depends on purchase, issue and cost of items utilized/ used by the units. A large number of studies in this area were
planned and completed. Comparative studies and any improvement in the material management should essentially reflect changes in the process of organizational sector. For all the above facts and factors, the main object is the functioning and planning of the unit, which play an important role in the power distribution in the respected area. If the material management is successful in the unit that will lead to encourage total power industry system of the State Government.

**Statement of the Problem**

Material management is a popular practice among the organized and unorganized sector because of the higher necessity and less non–performing assets in the organisation sector. The importance in the material management is increasing day by day especially after the globalization came into encourage the public and private sectors. The performance of the material management is very important in both quantitative and qualitative. A study of qualitative and quantitative in the power sector shows the service productivity of the power distribution among the public. The service productivity of power sector may be viewed in terms of service dimensions, service attributes, reliability, responsiveness, assurance, empathy and tangible to the consumers. Since the consumer is the King, any type of service sector has to start with the customer and end with the customer. The present study focuses on the material management at the Simhachalam Power Distributors especially to provide quantitative and qualitative service to the consumers in order to offer better performance. Hence, the present study focuses on the material management
performed by the Simhachalam Power Distributors in purchasing and issuing of materials and at the same time observing the cost of the materials.

**Need for the Study**

The fast developing Indian economy has placed before the materials manager a tremendous challenge and responsibility. In many organisations, materials form the largest single expenditure item. An analysis of the financial statements of a large number of private and public sector organisations indicates that materials account for nearly 60 per cent of the total expenditure. The importance of materials management lies in the fact that any significant contribution made by the materials manager in reducing materials cost will go a long way in improving the profitability and the rate of return on investment.

The material management in power distributors in public and private sectors possesses a vast power consumer base but the power distribution organizations may not be aware of the feelings, attitudes and behavior of the consumers fully in their relation with power usage. In more precise terms, the power distribution organizations should know who is a real consumer and who is not, what their consumption pattern and utilization of power. Interacting with the transaction of material in the power distribution units through purchase, distribution/ issue and maintaining of stock balances to satisfy the power consumers in its jurisdiction is an extremely complex process. One of the ways for achieving this is by conducting a through research and analyzing the information provided from the selected power distribution unit.
One of the important objects of the power distributing unit is to provide a un-interrupted quality power to its all categories of consumers. To fulfill this, the organisation has to take so many measures and steps by which the customers will satisfy. As the result, consumer satisfaction is the new driver of the development economy. The power distribution organization has pushed the consumer into a boom through its valuable services. There is a hectic competition among the public and private power distribution organizations in providing qualitative power to its consumers. The survival and success of the power distribution organizations rest on the services offered by them to the consumers and satisfaction level of consumers. Service to the consumers play a very vital role in the power distribution organization. The consumers’ attitudes and behavior exercise a major influence on the perception of the power distribution organization. The service dimension of each service sector is as important as it forms the basis of evaluation criterion and implements it; if the service provider understands client’s evolution criterion and implements it; then the efficiency level goes up, increasing customer satisfaction. This is the ultimate aim of all the service providers, as it is roved by earlier research that getting a new client is more time-consuming and ineffective than in retaining an existing client. The service productivity of the power distribution organizations is the deciding factor of their performance in the public/private sector. The service productivity depends on both quantitative and qualitative aspects. The quantitative aspect shows the service productivity of the power sector towards consumer needs, while the qualitative aspect indicates the level of consumer satisfaction towards the service offered by the power distribution organizations. Since, the State Electricity Board which is providing power to all sections of the
consumers. Simhachalam Power Distributors are the largest power provider, which is popular in the distribution electricity to all of its consumers has been selected for the present study. The success of the power distribution by this unit, rests on its’ service productivity based on the materials management. These materials, which are used daily in regularize its power supply to its consumers. Hence, there is an attempt to study purchasing of material, distribution, maintenance of stocks and consumers’ satisfaction in power distribution from the Simhachalam Power Distributors in Visakhapatnam Area.

Objectives of the Study

The overall objective of the theses is to examine whether the APTRANSCO is following the Scientific Techniques of Material Management and estimate the wastages, it also aims at suggesting policy measures to promote efficiency in material management.

In the light of the outline of material management in one side and review of relevant literature on the other side, the investigator had conceived the following objectives for the present study.

1. To understand the profile of the State Electricity Board and the factors influencing in material management.
2. To examine the importance of material management in power distribution organizations.
3. To study the different types of items purchasing and distributing pattern of the selected power distributors.
4. To analyze the trends in purchasing, distributing and pricing of the materials in the selected power distributors.

5. To study relation between purchasing, distributing and pricing of materials in the Simhachalam Power Distributors.

**Operational Terms**

**Stores:** Broadly the stores can be studied under three areas, namely, receipt, stocking and issue which are relating to material management. It will be seen that at every stage a great deal of information is required for checking, controlling and feedback purposes. Well designed stores systems and procedures ensure timely information for decision-making, particularly because stores is the starting point of all activities for control. Let us briefly consider the systems and procedures in each area.

**Purchasing:** Purchasing has come to stay as the most important function of materials management. The moment a buyer places an order he commits a substantial portion of the finance of the corporation which affects the working capital and cash flow position. He is a highly responsible person who meets various salesmen and thus can be considered to have been contributing to the public relations efforts of the company. Thus, the buyer can make or mar the company's image by his excellent or poor relations with the vendors.

**Issues:** Issues also one of the most important functions of materials management. The moment of items from the stores to our side by who on a purposive manner with suitable reason and record is treated as issue of material.
He is highly responsible people who meet various storekeepers and thus can be considered to have been internal consistent on records of the organisation.

**Stock Verification:** It is the process of physically counting, measuring or weighing the entire range of items in the 'stores and recording the results in a systematic manner necessary in material management. The purposes served by stock verification are as follows, to reconcile the stock records and documents for their accuracy and usefulness, to identify areas which require more disciplined document control, to back up the balance sheet stock figures; and to minimise pilferage and fraudulent practices,

**Research Design:** Since, the present study is interested in finding out the trends in material management in terms of the purchasing items in quantity, issuing those items for regular service utilization and costs of each item during the study period. In the resent study, the secondary data of materials handled in Simhachalam Power Distributors office was analyzed to reveal the process in purchasing, disbursement and maintenance of stock. So, it is quantitative in nature. At the same time besides analyzing the purchase, issue and pricing levels of the organisation, various dimensions of the service offered by the selected distributor, the qualitative aspect is also examined. The structured data collection includes a large number of representative cases, with analysis of data and generalization of results. Naresh K. Malhotra would call the above situation of the study as Exploratory – Quantitative Research in Nature.
Case Study in Examining – What, How and Why

Simhachalam Power Distributions came under APEPDCL. Since it is new and big establishment with 44 Mega Watts capacity to distribute power supply in north coastal Andhra Pradesh. Since it is a new incumbent its problems relating to materials are large enough to probe these areas for the present study purpose.

Even though, there is no scientific method of estimating future requirements of materials and replacements. Hence it is suggested that material plan should take care things like obsolescence, replacements and future plans, so as to maintain important activity with greater care.

Since Simhachalam Power Distribution is a new incumbent into Andhra Pradesh Power Sector. Hence, an attempt has been made as material planning, waste, useless party along with material issues and control. Hence, this study emphasises computerization of all aspects relating to materials and control processes.

Prior to globalization one organization by name APSEB used to look after the generation, distribution and operation of energy sector throughout the state. Since the state has accepted huge loans from the World Bank to invest on power sector in Andhra Pradesh.

Simple Changes in Stock – Used in Different Techniques

1. Issuing Techniques
2. Planning Techniques
3. Fast, Slow, Non-moving Techniques (FSN)
4. Use of Appropriate Statistical Tools in the Analysis Tables
Nature of Data

Only the secondary data are used in the present study. This data was drawn from records of the office maintained by the office bearers. The national and statewide data collected from the national and state authorities.

The following table explains about the items that are considered under material management in the selected power distribution unit. These materials maintained in the stores of the study unit. The material management of the list of items from the selected unit is presented in the Annexure table at the end of this book and the major items which are taken in the current study for the material management during the 2005-06 and 2009-10 years is listed in the following table 2.1.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Materials</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>LT cross arms</td>
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<tr>
<td>2</td>
<td>Fuse units</td>
</tr>
<tr>
<td>3</td>
<td>PVC SC wire</td>
</tr>
<tr>
<td>4</td>
<td>PVC pipes and bends</td>
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<tr>
<td>5</td>
<td>Energy meters</td>
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<tr>
<td>6</td>
<td>PVC cable</td>
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<tr>
<td>7</td>
<td>Aluminum LUGS</td>
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<tr>
<td>8</td>
<td>TC Fuse wire</td>
</tr>
<tr>
<td>9</td>
<td>PVC cleats and LT bushing rods</td>
</tr>
<tr>
<td>10</td>
<td>Bus bar boards and XLPE cable 3.5 core X 95 SQMM</td>
</tr>
<tr>
<td>11</td>
<td>11 KV materials</td>
</tr>
<tr>
<td>12</td>
<td>RCC poles and base plates</td>
</tr>
<tr>
<td>13</td>
<td>Street light materials</td>
</tr>
<tr>
<td>14</td>
<td>Nut and bolts</td>
</tr>
<tr>
<td>15</td>
<td>PSCC poles</td>
</tr>
</tbody>
</table>
Sampling Frame and Scope

The study is based on secondary data. The total number of different types of items purchased, issued and cost of those materials handled by the Simhachalam Power Distributors in Visakhapatnam during 2005-06 and 2009-10 have considered for the present study.

The present study covers only the items purchased by Simhachalam Power Distributors in Visakhapatnam especially those which are regularly utilizing and maintaining during 2005-06 and 2009-10. The performance of Simhachalam Power Distributors Office is also analyzed for a period of five years from 2005-06 to 2009-10.

Frame Work of Analysis

In the present study service productivity is measured in both quantitative and qualitative terms. In quantitative terms, the service productivity is measured by the following equation.

\[
\text{Service productivity} = \frac{\text{Quantity of Issues}}{\text{Quantity of Purchase}}
\]

In the present study, the outputs taken for the productivity analysis are items of material purchased, items issued by the organisation and total amount paid, whereas the purchases relate to number of each items purchased by the organisation and the number of items issued during the period of study.
The service quality is measured with the help of consumers expectations and satisfaction of the services provided through power distribution by Simhachalam Power Distributors. The statistical analysis of log linear regression model is used to reveal.

i) Determinants of consumer satisfaction. The model applied is

\[ \log y = A + a_1 \log x_1 + a_2 \log x_2 + \ldots ..., \quad an \log X_n. \]

\[ Y = \text{satisfaction level of the consumers.} \]

\[ X_1----X_n \quad - \quad \text{Independent variables.} \]

\[ a_1 ----an \quad - \quad \text{Regression Co-efficient.} \]

\[ A \quad - \quad \text{Intercept.} \]

ii) To test the significant difference between the mean score of various items related to number of units purchased and number of units issued, the ‘t’ statistic is applied.

iii) In order to find the trends in purchasing of items, issuing of items and cost of items during the period, the log linear type regression model is applied. Where time is Independent variables and each item has taken for dependent variable.

iv) The Karl Pearson Correlation CO-efficient is used to find out the relationship between the purchases, issues and cost of materials.
Chapterisation

The thesis is presented in seven chapters. The Chapter one is introductory providing back drop of the study and the research problem related to material management. This Chapter includes creative purchasing and important steps in purchasing of materials, which is one of the important features of material management. The store system and procedure where the important activities and measures takes place in store keeping is explained in the same chapter.

The review of related literature presented in the Chapter two where a broad review based on research work on material management in India and abroad is explained and research methodology followed in the present study. It outlines the objectives, need for the study, data collection procedure and the statistical tools employed for analysis.

The Chapter three gives general profile of Andhra Pradesh State Electricity Board and the performing activities of the power distribution units is explained. Andhra Pradesh State Electricity Board (APSEB), precursor of the present day unbundled entities – AP Power Generation Corporation (APGENCO), AP Transmission Corporation (APTRANSCO) and four distribution companies (DISCOMs).

The Chapter four presents the brief outline of the AP Eastern Power Distribution Company Limited (APEPDCL).
The Chapter five deals with the data analysis and interpretation of the items purchased, issued and maintained in the stock balances of the selected power distribution unit. In this unit there are three sections, the first section deals with the purchasing details of items, the second section deals with the issuing details of items and the third section deals with the total cost of each item purchased during the study period.

The Chapter six consolidates the important observations made in the study and offers suggestions to enhance the organizational effectiveness in the light of analysis of problems and findings.
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