CHAPTER VI

Efficiency of Inventory Management
The present chapter deals with the efficiency of Inventory Management in Thermal Stations in Andhra Pradesh (state sector). More specifically, a focus is made on the study of trends and levels of inventory investment; structure of inventory, inventory turnover, use of inventory investment in relation to production and sales; and computerised inventory management in the Thermal Power Stations in Andhra Pradesh (state sector).

Inventories are essential for any production enterprise, without which carrying of production is very difficult. Inventories keep the market intact and they serve as lubricants and springing for the production and distribution system. Further, inventories must be sufficient to take care of the requirements of demand till the next supply arrives and they must be protected from the probable delays in supply as well as variations in demand. Inventories act as protective cushion for the continuous operation in any manufacturing enterprise. The combination of raw materials, consumables, spares, bought-out components, work-in-process and finished goods are termed as inventories. Inventory means tangible property held (i) for sale in the ordinary course of business or (ii) in the process of production for such sale or (iii) for consumption in the production of goods and services for sale, including maintenance supplies and consumables other than machinery spares. Inventory is created for two primary purposes i.e., protection and economy.

It aims to have adequate supply of materials available to meet requirements for continuous operations. This would ensure that the inventory of finished products would be available to meet the demand, thus permitting marketing and
sales to function with the knowledge so that their products can be delivered as requested and to effect the lowest product cost through the best economical order quantity to purchase at a given time. Savings can sometimes be released from the longer production runs, thereby permitting larger quantities to be purchased at one time.

Inventory management involves the process of planning and control of assets being produced with a view of selling in the normal course of the operations of the enterprise. The Inventory Management is an important area and it plays a vital role in the economic operations of an enterprise. The importance of inventory management of an organisation depends upon the extent of its inventory investment. Heavy inventory holding leads to unnecessary blocking of scarce capital and leads to high holding costs. On the other hand, inadequate inventories lead to stock out costs. Therefore, it is necessary to divide judiciously about the size of inventory in an enterprise. "To achieve higher operational efficiency and profitability of an organisation, it is very essential to reduce the amount of capital locked up in inventories. This will not only help in achieving return on investment by minimising tied-up working capital, but will also improve the liquidity position of an enterprise"². However, there are a number of factors, which influence the excessive investment on inventories. The following are the some of those factors:

a) Dependence on imports, b) Seasonality, c) Scarcity, d) Advantage associated with bulk purchasing, e) Uninterrupted flow of production, f) Abnormal like in prices, g) Critically of materials, and h) Higher lead time.
Hence, the objectives of inventory management is to minimise the investment on inventory and too meet the expected demand for the product by way of organising the enterprises production and sales operations. For balancing the two conflicting objectives, a considerable care has to be taken by the management.

Inventory Management Policy

The committee on public undertaking has suggested that the inventories in any enterprise may vary according to the nature of the undertaking and the type of materials used. Further, the committee has also advised the public sector enterprises to take necessary steps for inventory management by applying various scientific techniques to control inventories and to maintain their levels as low as possible. The committee has observed that all the items held in stock should be properly classified and codified in order to minimise the cost of holding and also stressed the need to minimise the risk of stock-out and to reduce investment on inventories. The enterprise should adopt automatic replenishment system based on minimum, maximum and reorder levels with regard to regular usage of materials and these levels should be reviewed periodically.

The committee noticed that no single undertaking has been working out ordering and carrying costs on a systematic basis. There has been a practice in public enterprises to determine the order quantities on the basis of consumption and lead-time only. Hence, public undertakings should workout ordering and carrying costs on a scientific basis, which will enable them to determine the economic order quantity and this should be reviewed periodically. The committee suggested that if
any item is not required by the enterprise, the same could be transferred to a separate salvage stores for disposal. The committee observed that many public enterprises are not adopting value analysis in a systematic manner. Hence, it has emphasised for strict implementation of the value analysis, since it enables the enterprise to achieve cost reduction.

It is observed that inventories in India whether in private sector or public sector are much higher than those in the U.S.A and the European countries. Japan has the lowest ratio of material cost with a moderate incidence of labour costs, which explain its competitiveness in the international market. In India particularly in most of the manufacturing concerns, the inventory management systems were neglected till recently. Consequently the working capital of several concerns had gone-up leaps and bounds neglecting all accepted norms.

The studies revealed that the area of inventory control is being neglected in power sector thermal stations leading to piling-up of inventories and consequently mishandling, wastage's and locking up of invisible funds. The structure of inventory in thermal stations take a different shape where one class of inventory items i.e., (Coal, specific oil) stores, and spares including capital stores constitutes the major share of the inventory investment leaving a marginal share to be covered by the finished products i.e., electricity. It implies that concentrated efforts on one class of inventory items with scientific and innovative methods of inventory control helps in releasing the tied-up funds for other productive purposes. Further the studies made in India have revealed that scientific techniques of inventory management can reduce inventory investment, some times as much as fifty percent.
or even more. Therefore, it is the area that offers a greater scope for the improvement and needs greater attention and research on power sector thermal stations. Therefore, investment in inventories should be subjected to rigorous control to ensure that every rupee of investment in inventory has contributed to increased profitability.

Against this backdrop, an attempt is made now to examine the inventory management in thermal power stations in Andhra Pradesh. Further, a comparison is also made to pinpoint the differences if any, in the practices of inventory management in various thermal stations in Andhra Pradesh.

APGENCO is the one of the power producing industries in Andhra Pradesh, which is meeting most of the demand of power of Andhra Pradesh. The sound foundation of the company with its moral fabric has withstood all external and sometimes internal on slaughts because of high morale of the officers, staff and workmen employed all these years. Things went on satisfactorily to a great extent even without written rules and regulations and manuals etc. However, the changes for improving efficiency are taking place all over India and the APGENCO cannot afford to lag behind. Inventory management assumes a great importance and it is considered necessary to bring about uniformity in the field of inventory management to achieve common objectives.

Thermal Power being coal and specific oil intensive industry, the bulk of the production cost accounts for in coal and specific oil. Reduction in material cost can be achieved by increased productivity of thermal power. A planned and systematic approach is called for to control the money spent on materials and to ensure
optimum return on the investment without sacrificing the efficiency of the organisation. Here the role of inventory management comes into play which deals with entire range of functions, which effects the materials flow, conservation, utilisation and the quantity and cost of materials. The primary objectives of inventory management in thermal stations in Andhra Pradesh are as follows:

a) To provide materials of specified quantity and quality when needed at the lowest possible overall cost.

b) To minimise the investment on inventories, being about low storage and carrying cost and developing higher inventory turnover ratio.

**Inventory in the context of the APGENCO (TPS)**

In financial parlance inventory is defined as sum of the value of raw materials, fuels and lubricants, spare parts, semi-processed materials at any given point of time. However, in the context of APGENCO, the term 'inventory' includes the value of the following:

a) Coal, coal in transit and under inspection.

b) Specific oil, oil in transit.

c) Spares and capital stores.

With this background, various aspects of inventory management in Thermal Stations are discussed below:
Inventory Levels and Trends in APGENCO

Accumulation of inventories in case of a corporation resulting in blockage of funds will deprive the corporation of the productive use of such funds. Apart from this, the excessive investment on inventories will have its own opportunity cost. In addition, accumulation of inventories results in heavy amount of carrying costs, which increase the cost of production and affect the profitability of the corporation. It is therefore, essential that the corporation should control its investment on inventories to keep at a desired level. Let us first examine the size of inventory investment in terms of current asset investment of the corporation. The ratio of inventory to current assets explains the proportion of inventory to total current assets. An analysis of the proportion of inventory to the total current assets will be helpful in examining the impact thereof on the profitability of an undertaking. Generally an increasing proportion of inventory is indicative of an inefficient inventory management. It also indicates the state of liquidity position of current assets. The higher the proportion of inventory to current assets, the lower will be the liquidity as compared to other current assets viz., receivables, cash and marketable securities since inventory is the least liquid component of current assets. On the other hand, if the proportion of inventory is lower in the total current assets, it will result in higher liquidity position, since the inventory forms the lower proportion of current assets.
### Table 6.1
Inventory to Current Assets

<table>
<thead>
<tr>
<th>Year</th>
<th>Inventory</th>
<th>(% in TA)</th>
<th>Current Assets</th>
<th>Inventory as a percentage of Current Assets (Rs. in lakhs)</th>
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</thead>
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<tr>
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<td>410551</td>
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<tr>
<td>1994-95</td>
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<td>23</td>
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</tr>
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<td>1995-96</td>
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<td>30.05</td>
<td>625109</td>
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<td>Percentage of increase during the period</td>
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<td>(279.15)</td>
<td>5142634</td>
<td>690.37</td>
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<td>Average (X)</td>
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<td></td>
<td>428552.83</td>
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<tr>
<td>% of increase</td>
<td>26.37</td>
<td></td>
<td>18.83</td>
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</table>

From 301.99 the APSEB divided into two parts i.e., APGENCO, and APTRANSCo.

The Table 6.1 furnishes the information relating to proportion of inventory to current assets investment and the rate of growth in inventory as well as current asset investment. It is clear from the table that the inventory investment of the company increased from 992 lakhs in 1959-60 to Rs.412357 lakhs in 1998-99. It works out 26.37 percent during the study period. It can also be seen from the table that inventory investment as a proportion of current assets decreased from 70.07 in 1993-94 to 46.93 in 1993-94. The inventory investment to current assets varied 43.02 percent and 70.07 percent during the period of study. It indicates that the inventory continued to from a major proportion of current assets i.e., 57.53 percent during the period of study. It can also be seen from the table that the inventory investment of the Board increased from Rs.108759 lakhs in 1988-89 to Rs.412357 lakhs in 1998-99. Later the inventory investment of the Board had been decreased to Rs.287659 lakhs in 1993-94, Rs.215491 lakhs in 1994-95 and Rs.378251 lakhs in 1997-98. It is also interesting to note that the proportion of inventory of current assets investment (on an average 57.63) in the case of APSEB is much higher than that of its counter parts in the central sector.

The table also shows that the rate of growth in inventory investment is varying between - 74.91 percent and 154 percent. The rate of growth in current asset investment is varying between 99.12 percent and 137.43 percent.

The reasons for increase in inventory during 1993-94, 1995-96, 1996-97 was due to increase in the cost of stores, spares, coal, special oil. the inventory investment has shown a downward trend during 1990-91, 1994-95, 1997-98 due to introduction of new projects and expansion of old projects, which resulted in the minimum use of stores and spares for the new machinery, which does not require repairs and renewals during the years of their purchase. It shows betterment in the control of inventory in these years. It may be the result of disposal of non-moving.
obsolete and unwanted items. This indicates that the share of inventory in current assets is low, since the APGENCO is the power industry and deploys heavy machinery. Thus, there is a need to reduce the inventory further in proportion to current assets. This analysis further shows that there is no consistent pattern in the inventory in proportion to the current assets of the Board during the period of study. As it is observed that inventories constituted 57.53 percent, on an average, indicating the need of keeping a strict vigilance over the inventories in order to optimise the use of working capital in an effective manner. Thus, volatility is an alarming trend, which suggests redesigning the inventory policies and working of inventory control system in the board.

Moreover, during the period of study, the investment on inventories by 279.15 percent showing an average 25.38 percent per annum, while the increase of current asset investment is 430.99 percent an average increase of 39.18 percent per annum. This clearly points out that the investment on inventory needs an effective control to bring down the level of current assets to an optimum level to improve the profitability of the board.

Structure of Inventory in APGENCO

The trends in different components of inventory and their proportions to total inventory so as to comment upon the components of inventory that formed significantly in high proportions to the total inventory and also identify, the inventory component, which is responsible for increasing trend in the total inventory investment. Further, this analysis reveals. The component of inventory that resulted in blocking up funds and also provides an idea about the implications for production and sales activities. Moreover, necessary steps can be suggested for an effective control of inventory.
<table>
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<tr>
<th>Year</th>
<th>Station</th>
<th>Generation (MU)</th>
<th>Coal linkage (MT)</th>
<th>Coal received (MT)</th>
<th>Coal consumption (MT)</th>
<th>Oil consumption (KL)</th>
<th>Coal (Kg)</th>
<th>Oil (ml)</th>
<th>C.V. of Coal KCal/Kg</th>
<th>Heat rate Kcal/Kwh</th>
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Table 6.2
Thermal Power Stations-Fuel Particulars
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<th>Coal consumption (MT)</th>
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MT = Million Tonnes


The Table 6.2 shows the classification of inventory in APSEB / APGENCO during the period 1982-83 to 2003-04.
Measures of Effectiveness of Inventory Management

It is not easy matter to measure the inventory performance objectively. The performance data normally asked for may not reveal the true state of affairs as some of these can also be manipulated intentionally or unintentionally to show better performance.

For the purpose of monitoring effectiveness of the inventory management, a variety of tools and techniques can be used in planning the investment on inventories and also can have constant feedback on the liquidity and profitability conditions of existing inventories. For this purpose a package of measuring tools can be employed. Inventory turnover ratio is one among them and it is a very important parameter used to evaluate the techniques of inventory management. According to Foulke, the turnover of inventory may increase in one of the three ways i.e., (a) by maintaining sales at a constant level with a decreased inventory level, (b) by expanding sales and on the same inventory and, (c) by increasing sales and reducing inventory.

All other things being equal, turnover and net profits will increase slightly in the first situation and more in the second and third situations.

Inventory Turnover Ratio

The inventory turnover ratio is also known as stock turnover ratio. It establishes a relationship between the cost of goods sold during a period and the average amount of inventory. It is one of the methods of reviewing performance
and controlling inventories periodically to check the inventory turnover of each raw material supply and finished goods.

The turnover of inventory directly affects the profitability of a firm. The higher the turnover, the larger the profit of the firm would be, and each turnover adds to the volume of profits. A high turnover also indicates that the firm has conducted more business with proportionately less amount of inventories, which results in saving of inventory costs. Moreover a rapid turnover contributes to higher capital turnover. It may give an impression of increased effectiveness of inventory management. On the other hand, a slow turnover is a boon to the management as it results in over investment in inventory. Therefore, the management should speed up the turnover of inventories by controlling their volume to the extent possible.

Further, the inventory turnover ratio acts as an indicator of the liquidity of inventory. In other words, this ratio helps in determining the liquidity of a concern in terms of the rate at which inventories are converted into sales rather than into cash. This ratio helps in judging the efficiency of inventory management.

Thus, a high turnover is usually indicative of efficient operations. It has the following merits.

a) A good turnover makes for a more efficient use of capital funds.

b) A product, which has a good turnover rate, is comparatively a fresh product for the customers.

c) The items, which have fast turnover, cost less in storage.

d) The selling cost per unit on fast turnover item is low. This manifests in a
greater contribution to net profit.

e) A satisfactory turnover rate reduces "mark downs of damaged merchandise, which has been lying around".

According to Prof. Graham and Prof. Golerrick, the chief criterion of inventory soundness is the turnover defined as the annual sales divided by the year-end inventory. However, the refined way of measuring the turnover is related to the average inventory with the cost of goods sold instead of sales.

\[
\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}
\]

Average inventory means opening stock + closing stock divided by two.

\[
\text{OR} \quad \frac{\text{Annual Sales}}{\text{Closing inventory}}
\]

It is proposed now to examine inventory turnover of the APGENCO / APSEB to enquire into efficiency in the use of inventory investment.

**Inventory Turnover in APSEB / APGENCO**

Information regarding the inventory turnover in APSEB / APGENCO. It can be observed from the Table that the inventory turnover in APSEB is varying between 0.87 and 1.06 times during the period under review. In terms of average inventory turnover works out to be 0.995 times which by no means is considered to be not satisfactory when compared to the inventory turnover of the same enterprises in developed countries like USSR, USA etc., and private sector enterprises in India. In USA and USSR these enterprises are registering a turnover
from 5 to 7 times\textsuperscript{11}.

**Computerised Inventory Management**

In large public sector undertakings, inventory management division handles lakhs of documents and related communication leading to a mammoth amount of paper work and volume of data. It is difficult to monitor and analyse such a huge data manually. New thrust has been given in the area of computerisation. Inventory management is an area in which the computers can be put to beneficial use. At present, out of possible 360-meter hours of a computer in a month, only 25 hours are utilised for inventory management. Since computerisation of inventory control will provide a better control and profitability, there is a rich potential for computerisation in the inventory management field. For proper control and management of inventories, most of the big organisations are today managing the entire materials function in an integrated manner with the help of computers. Feeding correct information to the computers is the very corner stone of success of such a computerised system.

With their increasing variety and heavy demand made on them, materials are today assuming an important role in the operational efficiency of an organisation. It is imperative to conclude that computers could be utilised to guide all the activities involved in getting the materials to the factory. This integrated computer system would involve the active participation of line personnel and would be more useful for operational information - management reports which could be obtained as a by-product.

The present use of computers in inventory management is only to make computations easier and faster. The integrated computer system should be utilised
for the sake of integrated information system, which would result in smooth operations of the material functions. The main objective of such an integrated system should be accuracy in reporting demand and inventory. The integrated system also ensures a fast reaction to environmental changes - changes in either supply or price of materials or changes in customer tastes and measurement of functions such as inventory, purchasing and vendors.

A computer can easily maintain the normal flow of information regarding materials is an organisation with the basic data coming from production planning, design and maintenance of departments and environmental information coming from the purchase and sales departments. It can give back the information of inventory records to the production planning departments, and send purchase requisitions to the purchase department, remind purchase department for follow up and place direct purchase orders for standard repetitive items. It can update the past record file with revised consumption figures for items and check the actual consumption against the bill of materials and material cost incurred to user departments. On the basis of record and basic data, the computer can formulate inventory levels.

The distinct advantages of integrated computer system are that it involves line personnel and provides timely and quick information of the materials position. It is also used for operational convenience and not for mere calculations. The studies conducted in India and abroad indicate that computers have been fruitfully used in organisations where the primary objective to the computer system is operations management. The use of computers for only computations is probably
the reason why businessmen are not sure of their worth.

Integrated management information systems using computers are applicable in the following areas. The list is only illustrative and not exhaustive.

a) Long term production schedule.
b) Short term production schedule.
c) Materials manual.
d) Requirement of non-stock items from the user departments.
e) Information regarding lead time, supply position (shortages) price trends, anticipated price changes etc.
f) Production schedule handed over to production department.
g) Materials requisition from the consuming department.
h) Materials supplied from stores to consuming department.
i) To and fro information between stores and the inspection wing.
j) Information regarding receipts from the stores.
k) Date regarding issues from stores.
l) Due dates of supply from purchase department.
m) Information to purchase department for follow up of supplies.
n) Purchase requisition to purchase department.
o) Purchase order.
p) Materials from supplier to stores.
q) Previous years consumption data.

The following operational reports emanate from the computers. Here again the list is not exhaustive.
a) Bill of Materials.
b) Price forecasts.
c) Purchase budgets.
d) ABC analysis.
e) Inventory levels.
f) Item below safety stock levels.
g) Movement analysis.
h) Materials accounting and summary issues.
i) Stores accounting
j) Stock verification.
k) Vendor rating.
l) Sector wise and material category wise purchase list.
m) Outstanding payments.

It is possible to get the following exceptional reports for managerial purpose.

a) Items for which consumption is more than the norms.
b) Items for which there is shortage of supply and anticipated price increase.
c) Items out of stock.
d) Items with stock levels above the maximum norms.
e) Obsolete items.

The most important and beneficial area of application of computers is in the field of inventory management. With the help of computers, documents are produced at a high speed and with a low cost. Further the information is processed
at a higher speed than that of manual operations.

At the inventory management stage the computers are used to control the level of inventories and to provide the materials at the right time. Computer can handle various data such as price, lead-time, cost of ordering, cost of carrying, historical data on delivery performance and so on very easily. Various techniques such as ABC analysis, EOQ etc., can be easily programmed into the computer so that tedious and time-consuming calculations are avoided. Also movement analysis, lead-time analysis and vendor rating can be computerised in a short time, which permits the management to carefully evaluate and take scientific decisions so as to control the inventory levels. The factors such as reserve stock, safety stock and reorder points require statistical and mathematical analysis. When thousands of items are to be procured, it will be impossible to control them manually. The programmes are available for performing ABC analysis EOQ calculations; reorder point computations and delivery schedule printing. This will come as a part of 'software package' in most of the cases. A-items are normally controlled manually with crucial and timely information support from computers. Thus, computers may print out stock status of A-items, order pending execution, and expected consumption, so that follow up will be done on a selective basis to keep inventories at minimum level. 'B' and 'C' class items are usually large in number and here computers may be used to order EOQ and re-order point control. Requisition analysis, processing of enquires and quotations analysis can be done very effectively by using the computers. The receipt and issue documents can easily be computerised. This is useful in keeping product costing, materials accounting and maintaining of perpetual inventory records. This results in better physical verification.
Computers are being put to the best use in inventory control applications successfully in a few undertakings. But unfortunately in several undertakings the inventory control functions are not on the computer or even if so, they exist to a very limited extent. In some organisations, only a few of the items are computerised, with many items still to be computerised. Even where computers are used, "real time data" is mostly not available despite the fantastic speed with which a computer can process the data. It is not of any use to get statements four to five months after the transactions are over, as it cannot serve any useful purpose. Lot of snags do exist, starting with the non-availability the computer time, inability to ensure correct and timely inputs to the computers non-correction of the computer edits, printing of the final statements etc. Even the very few statements taken out are sometimes not put to any effective use. Sometimes accounting procedures, which are predominantly 'audit' oriented come in the way of timely output of statements. A serious look is needed to reorient/device the accounting procedures, to suit exclusively the material control functions. Under the present procedures, the quantities of material received / issued do not enter into the statements until all the receipt, inspection and issue documents are finalised, which in some cases might take several months. In such cases for all practical purposes, the materials do not exist on record though they are lying in the stores or exist on record though physically issued and stocks are nil. In view of the colossal amounts of money involved in inventory control function and the savings that can be affected by timely actions, installation of third generation computers, with instant direct data feeding facility to the computer from all the feeding points becomes a vital necessity.
One of the most serious problems with regard to inventory control is improper documentation. The production and maintenance departments are usually too busy to maintain records of stores, spares and other materials with the result that when an indent is floated majority of the 'justification forms' are either left blank or filled up which a computer can process the data. It is not of any use to get statements four to five months after the transactions are over, as it cannot serve any useful purpose. Lot of snags do exist, starting with the non-availability of the computer time, in ability to ensure correct and timely inputs to the computers, non-correction of the computer edits, printing of the final statements etc. Even the very few statements taken out are some times not put to any effective use. Sometimes accounting procedures, which are predominantly 'audit' oriented come in the way of timely output of statements. A serious look is needed to reorient/device the accounting procedures to suit exclusively the material control functions. Under the present procedures, the quantities of materials received/issued do not enter into the statements until all the receipt, inspection and issue documents are finalised, which in some cases might take several months. In such cases for all practical purposes, the materials do not exist on record though they are lying in the stores or exist on record though physically issued and stocks are nil. In view of the colossal amounts of money involved in inventory control function and the savings that can be affected by timely actions, installation of third generation computers, with instant direct data feeding facility to the computers from all the feeding points becomes a vital necessity.

One of the most serious problems with regard to inventory control is improper documentation. The production and maintenance departments are usually
very busy to maintain records of stores, spares and other materials with the result that when an indent is floated majority of the 'justification forms' are either left blank or filled up with cooked up figures. How precise and accurate the procurement decisions can be under such information gap, is anybody's guess. When correct information on 'consumption' and 'dues in' is not available, inflated quantities find their way into the purchase orders. The much talked about Economic Order Quantity formula is mostly not used and safety stocks go by hunch. It is very essential to establish the most vital link-between consumption, stocks, dues in, working stocks, safety stocks, purchase order, receipts and inspection for each item without which all professions about inventory control will remain only a pious talk. This vital link has to be established on the computer, which takes the shape of a data bank for inventory control, retrieval of the requisite information, making analysis and for making quick decisions.

To introduce any inventory control systems, first of all it is necessary to prepare the ground thoroughly like the design and adoption of a viable material code, computerisation of all the inventory control functions and establishment of the vital data bank as dealt in earlier paragraphs. Once this is achieved, 'the periodic review system' in respect of high value items, after working out the stocks, can be introduced. If these vital preparations are not made, inventory control will remain a topic for seminars only and not for practice and results.

**Computerised Inventory Management in APGENCO**

APGENCO is the largest power producing company having five units detached far away from each other and the head quarters, it becomes very difficult
to get the inventory position at any given time, if the inventory accounting is done manually. Moreover, timely preparation of control statements to assist proper inventory control and other material management functions is not possible manually. Therefore, in order to introduce the latest techniques of inventory management in APGENCO, the computerised inventory management has been introduced in a phased manner. During the past few years, great strides have been made in the use of computers in inventory control system. Many advantages of this equipment are derived by the APGENCO in reducing the investment on inventory. Computers are being increasingly procured and used for purchase, inventory control and store keeping. In APGENCO, the computers help in maintaining up-to-date position of receipt, issue, and stock position.

A Small beginning during 1990-91 was made when the personal computers were installed in all thermal stations of the APGENCO. All the thermal stations - stores is now fully having on line material management systems. Main stores also have on line material management system. Efforts are now underway to linkup the entire thermal stations computers to corporate head quarters through an online to ultimately linkup the entire thermal stations stores with each other for data sharing and improve material management. Computers are installed in the new places where they were not provided earlier. On line material management was developed in a phased manner. This system has receipt, issue inventory, and indent modules, which help in making stock search, alternate search, material movement, have become fairly routine operations now.

On line computerised inventory management system for Kothagudam
thermal station and Vijayawada thermal station has been introduced during the year 1993-94 computerisation for project monitoring was also introduced for VTPS, RTPP. A comprehensive computer network was also installed for RTPP. Muddanur as per the recommendation of the German Consultants during-super-16 computer system, unipower-30 computer systems were also installed. A comprehensive centralised data base was organised on the corporate computer system for material management to have on line stock status enquiry which is used by material management function more effectively for decision making, procuring of stores, better inventory control and taking action in respect of non-moving items.

The introduction of online computer system in the APGENCO is a major step towards the development of inventory information system. The objectives of online computer system, which was introduced in the APGENCO (APSEB), are as follows:

a) To maintain stores ledgers of up to date and current information by daily posting of stores transactions in the computer files.

b) To conduct ABC analysis and to exercise control on stock levels with respect to maximum, minimum and re-order levels.

c) To analyse consumption variations.

d) To fix lead time for procurement of stores

e) To suggest for the disposal of non-moving items.

f) To initiate timely recoupment action and to provide facilities for follow up of supplies.

319
g) To maintain suppliers files and analyse vendors performance

h) To provide necessary information to stores, purchase inspection, accounts and user departments.

Various Management information system (MIS) reports are being generated for internal use as well as for submission to different Government agencies, which monitor the operations of the corporation. The management information systems on production performance, exceptional reporting on inventory management, safety, were developed and maintained. Besides the business systems were installed during the year 1996-97 to further strengthen the in-house computerisation programme.

Computerisation is a continuous process in the APGENCO (APSEB) and more application areas/activities are covered under computerisation programme for better monitoring and taking speedy and effective managerial decisions. The computerised pay roll system was covered in respect of all the employees of the (APSEB) APGENCO with the help of National Information Centre at Hyderabad. The pay roll work of monthly category employees and the stores accounting system to monitor item wise consumption was decentralised and is being done on computers at all the thermal station areas. The computers have been extensively used in material management, purchase management, marketing information system, finance accounts, production, performance and monitoring, sales accounting, codification of spares, exceptional reporting system for material management including unmoved items report. Consumption pattern analysis, ABC analysis, project reports, hospital information system and executives personal data. The compilation of final accounts is also being done on the computers.
Computerised Stores Management in APGENCO

Stores department is an interface between material management division and works division. It is spread all over the length and breadth of the plant. The APGENCO has 5 depots to cater to the needs of internal customers. Several lakhs of diverse nature of items and equipment’s are stored. Unique catalogues number for its clear identification identifies each item during receipt, issue and accounting. The materials are being received from all over the country and abroad by rail or road. The material in the stores is being reconceived for avoiding any deterioration on account of long storage, good house keeping, and necessary protection from fire and theft hazards are being made.

In APGENCO Computers help in maintaining up to date position of receipt, issue and stock position. In APGENCO computerised stores management has been introduced in a phased manner. The first step in computerised stores management is proper codification and classification stores. The system of processing business information, which is based on electronic computers, is called Electronic Data Processing (EDP). The term EDP defines the complete process of collecting, punching, storing and processing the data. The computerised stores accounting and inventory control is put on Electronic Data Processing (EDP) to offer the main statements, the priced ledger statements and the consumption statement. Subsequently the following additional exception statements one obtained from electronic data processing in a phased manner for control purpose.

a) Issue summery-giving the consumption under different codes for each thermal station.
b) Inter stores transfer statements indicating the material issued to and received from different station stores.

c) Receipt statement No: 1 giving receipt by class of stores.

d) Purchase order status report indicating the process on outstanding purchase orders.

e) Commitment status of purchase order (item wise) indicating the outstanding position of the items against various purchase orders.

f) Consolidated inventory balance indicating the quantity and value of all the materials together.

g) Over stocked/under-stocked items list, giving the details of items above maximum and below minimum levels.

h) Quarterly receipt control statements (stores wise) showing the actual receipt against the quantity ordered.

i) Half-yearly unmoved items list (stores wise) indicating the items without any movement for over two years.

j) Consolidated unmoved items list giving item-wise and thermal station-wise list of items having no movement for over two years arranged in descending order of the total value.

k) Yearly ABC analysis, indicating the total yearly consumption of items arranged in descending order of the value along with percentage in relation to total value and total number of items.

The stores in the APGENCO, where very large lists running into lakhs of rupees are to be dealt with, it is preferable to prepare the lists in their natural constituent categories and then subject each of these to separate ABC analysis.
However the computer can assist the corporation in furnishing the lists in descending order of weightage cumulative totals and separating A, B and C items in the corresponding slabs fed into it.

**Computerised Purchase Management in APGENCO**

The purchase department in the APGENCO occupies a prime position in the area of material management. It plays a vital role in procuring the material of right quality at right price with timely delivery. Purchasing includes selection of sources of supply, finalisation of terms of purchase, placement of purchase orders, follow up, maintenance of smooth relations with suppliers, approval of payments to suppliers, evaluating and rating suppliers.

With the development of many kinds of electronic equipment ranging from the simple to extremely sophisticated many functions in the field of production, accounting, marketing and purchasing have found the equipment useful in an increasing number of ways. The APGENCO, in which around 50 percent of the corporation’s money is spent for the purchase function, utilises the computers and the data process equipment that supply the following data for efficient, purchase management.

a) Forecasting usage rates.

b) Measuring of deviations from the forecast of usage rates.

c) Calculation of economic order quantities

d) Calculating of order points considering the changing forecast

e) Scheduling and flagging forecast of overdue orders.

f) Preparation of stores accounting ledgers.
g) Calculating physical balances on hand, on order, and assigned and ABC inventory analysis.

h) Cost benefit analysis

i) Vendors rating

j) Maintaining non-moving and stock out items.

Computerisation of Purchase activities in APGENCO - Works completed

- Design and development of purchase order database.
- Releasing purchase orders on pre-printed stationery through computer.
- Establishing network among all sections in purchase department.
- Generation of stock statements.
- Generation of purchase order numbers.
- Developments of various reports based on computerised purchase orders.
Jobs On hand

a) Data base design for tender section

b) Development of system for monitoring of EMD and bank guarantees.

At Present the APGENCO is embarking on massive computerisation programme in its endeavor to install Information Technology based management. More and more systems have been brought under computerisation. Software programmes using Visual Basic (VB) as front end tool for accessing data bases in Oracle have been developed and are in use in all the departments for better monitoring of day to day issues. The company used tally for accounting department. Necessary certification was also obtained from C.M.C. In order to improve the computer proficiency, the company has been extending loans to the executives for the purchase of computers on easy terms.
REFERENCES


4. The inventory is considered to be least liquid component of current assets because it cannot release cash immediately as in the case of other components, unless it is sold on cash basis. If it is sold on credit basis, it forms another component of current asset called as debtors.


6. The effectiveness of inventory can be analysed by comparing the actual position of inventory with the budgeted information of a year or with that of the ratios pertaining to inventory turnovers of the previous years.


