2.1 Introduction

In the State of Andhra Pradesh, generation of power was carried out by Andhra Pradesh Power Generation Corporation Limited (APGENCO). After the formation of Telangana State, (as per the AP Reorganisation Act, 2014) APGENCO (the Company) has a capacity of 2,810 MW at two thermal power plants viz., Dr. Narla Tata Rao Thermal Power Station (Dr. NTTPS, 1,760 MW)[22] Vijayawada, Krishna district and Rayalaseema Thermal Power Station, Muddanur, Kadapa district (RTPP, 1,050 MW)[23]. The details of installed capacity, actual generation and cost for the years 2011-12 to 2015-16 have been furnished in the ***Annexure-2.1***. The power generation decreased mainly due to outages[24] of power plants, from 22,235 MU (Million Units) in 2011-12 to 19,359 MU in 2015-16. Further, the total cost per unit increased from ₹ 2.94 in 2011-12 to ₹ 4.34 in 2015-16.

Fuel forms a major component of the cost of the power generation and, therefore, has a direct impact on consumers. Fuel, for the purpose of this report, mainly refers to coal which constitutes nearly 86 *per cent* (***Annexure-2.2***) of total power generation in 2011 to 2016.

The price of coal is based on its GCV (Gross Calorific Value) which is a measure of its quality. The coal is purchased at a 'basic price' determined by the coal company for normal (ROM[25]) coal. The Company during the period 2011 to 2016, procured 732.88 lakh metric tonne (LMT) of indigenous coal, 60.90 LMT of imported coal and 1,18,897 KL of oil.

As per the Electricity Act, 2003, the State Electricity Regulatory Commission (SERC) determines various norms [Plant Availability Factor (PAF)[26] and Gross Station Heat Rate (SHR)[27] etc.] for operation of power stations. Central Electricity Authority (CEA) also fixes targets for power generation for Thermal Power Stations (TPSs) considering capacity of plant, average plant load factors and plant performance. The Company works out the requirement of coal on the basis of targets so fixed and submits the proposals for coal linkage to Government of India. Based on the Company's requirement, the CEA recommends allotment of coal linkage to Standing Linkage Committee (SLC) of Ministry of Coal, Government of India (GoI) which allots coal based on the availability at various collieries.

[22] Dr. NTPPS includes: Dr. NTTPS – O&M consisting of Stage I, II, III (6x210 MW) and Dr.NTTPS Stage IV (1x 500MW).

[23] RTPP includes: RTPP consisting of Stage I & II (4x210 MW) and Stage III (1x210 MW)

[24] Non availability of power station for generation of power

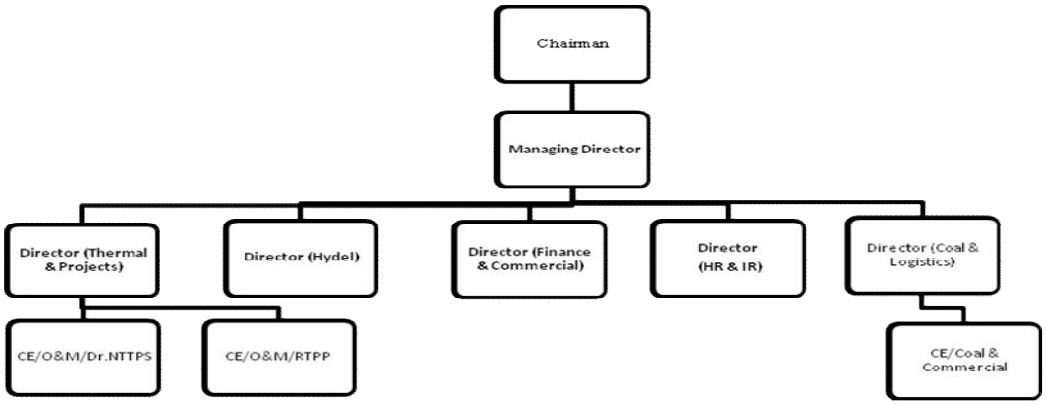
[25] Run of Mine Coal: ROM coal refers to Coal as extracted from the coal mine in its natural and unprocessed state.

[26] PAF is the ratio of actual hours of operation of the power station to the maximum hours available during a certain period.

[27] SHR is the energy (kCal) used/required to produce one unit (kWh) of electricity in a power plant.

2.2 Organisation Structure

The organisation structure of the Company (relating to purchase and transportation of fuel) is detailed below:



2.3 Scope of Audit & Methodology

The Performance Audit covered all issues relating to purchase, transportation and consumption of fuel including coal ash management in both the power generation stations (Dr. NTTPS and RTPP) of APGENCO covering the period from 2011 to 2016.

The audit methodology included

- Scrutiny of records relating to procurement, receipt and consumption of fuel, fuel cost reports, performance efficiency reports and ash generation and disposal reports;
- Examination of agenda and minutes of the Board meetings;
- Scrutiny of agreements with fuel suppliers and guidelines issued by Central Electricity Authority(CEA) / State Electricity Regulatory Commission (SERC), Ministry of Environment and Forest (MoEF), Government of India (GoI) and Andhra Pradesh Pollution Control Board (APPCB); and
- Interaction with the audited entity and analysis of the data with reference to audit criteria.

2.4 Audit Objectives

The Performance Audit was aimed to assess whether:

- The procurement of fuel was done economically, efficiently and effectively;

- The terms and conditions of agreements with the fuel suppliers were adhered to and penalties were levied in case of non-compliance/adherence thereof;
- The consumption of fuel in power generation and disposal of ash was inline with the norms fixed by SERC and Ministry of Environment and Forest; and
- An efficient and effective mechanism for inventory management and internal control existed to ensure adequate fuel availability as per prescribed norms.

2.5 Audit Criteria

2.5.1 The audit criteria derived from:

- Guidelines issued by the CEA / Electricity Act / SERC /Ministry of Environment and Forest / Company's policies and decisions;
- Provisions contained in agreements with Coal companies, Oil companies, Railways and transport agencies and other contractors/agents; and
- Norms of CEA and SERC for holding of inventory of coal and oil respectively.

2.5.2 Audit objectives and criteria were explained to the Company during an Entry Conference (May 2016). Subsequently, the audit findings were reported to the Management and the State Government (August 2016). The audit findings were discussed in the Exit Conference (September 2016). Replies to the audit findings from the Government were received in October 2016 and the same have been considered while finalizing the Report.

2.6 Audit Findings

Procurement of coal

Fuel Supply Agreement (FSA) is an agreement between the supplier and the purchaser of the coal for generation of power. FSA also indicates the Annual Contracted Quantity (ACQ) of coal pertaining to a particular year. The ACQ is the quantity of coal agreed to be supplied by the seller and to be purchased by the purchaser from the sellers' mines. The Company procured coal by entering into FSAs with the Singareni Collieries Company Limited (SCCL) and Mahanadi Coalfields Limited (MCL). Besides, the Company purchased imported coal through Central PSUs (MSTC, MMTC and PEC).

2.6.1 a) *Avoidable payment of incentive to MCL ₹13.07 crore*

As per FSAs, MCL was to supply 8.7 lakh metric tons (LMT) of coal to RTPP Stage I and 10.10 LMT of coal to RTPP Stage III per annum. The Company paid price of the coal in advance (stage-wise) to MCL for supply of coal. MCL supplied coal as per the payments made by the Company. As per the agreement, if the Company procures more than 90 *per cent* of the Annual Contracted Quantity (ACQ), it is liable to pay incentive.

Based on advance payment, MCL allotted coal to the Company. The Company entered into agreements with M/s. Global Coal and Mining Private Limited and M/s. Aryan Energy Private Limited for taking delivery of coal by the contractors for processing in their washery plants at MCL and onward transportation to RTPP by Rail-cum-Sea-cum-Rail (RSR) mode.

Audit observed that while the Company had procured coal in excess of the ACQ (98 to 126 *per cent)* for Stage I during 2011 to 2016, it procured less than the ACQ (70 to 80 *per cent)* quantity for Stage III. Due to procurement of coal in excess of ACQ, the Company had to pay incentive to MCL. Thus, lack of monitoring by the Company for stage-wise procurement of coal, resulted in avoidable payment of ₹ 13.07 crore towards incentive on excess procurement for Stage-I.

The Government (October 2016) stated that the quantity for Stage III during 2011-12 was not procured due to delay in finalisation of RSR contract for transportation of coal to RTPP and quantities have been procured based on the approval of the Board to meet the requirement at RTPP.

However, the payment of incentive could have been avoided had the Company monitored the procurement of coal.

b) Non-realisation of penalty from MCL- ₹ 231.88 crore

As per FSAs, in respect of Dr. NTTPS for the period 2011 to 2015, MCL had to supply 240 LMT (Stage I to III) and 51.86 LMT (Stage IV) of coal. Towards this, the Company paid stage-wise advances. The Company received coal from MCL by Railways rakes to Dr. NTTPS. For timely placement of rakes as per ACQ, the Company was required to coordinate with Railways authorities and MCL. If the Company received less than 90 *per cent* of the ACQ, it claimed penalty.

Audit observed that during 2011 to 2015, even though advances were paid by the Company, MCL had supplied only 142.38 LMT (Stages-I to III) and 30.7 LMT (Stage IV) of coal which was 59.33 and 59.20 *per cent* of the quantity to be supplied respectively. Regarding short supply of coal, MCL stated that this was due to short placement of rakes by Railways.

Audit further observed that failure of the Company to coordinate between Railway authorities and MCL for placement of required number of rakes resulted in short delivery of coal. In this regard, though the Company had claimed (between June 2012 and August 2015) ₹ 231.88 crore during 2011 to 2016 towards compensation for short delivery of coal, the same was yet to be received from MCL (March 2016).

The Government stated (October 2016) that the Company was pursuing continuously with MCL for receipt of compensation for short supplies. The Company's Officials posted at MCL (Talcher) were regularly pursuing with Railways for allotment of more number of Railways rakes to Dr. NTTPS. The Company also assured that the same would be pursued through the Government also.

The Government's reply was not acceptable in as much as though officials were posted for pursuance with Railways for allotment of required rakes, the fact remains that the Company had failed to obtain the coal as per the ACQ.

Besides, the Company had not got the compensation for short supply of coal from MCL till date.

2.6.2 (a) Absence of suitable clauses in coal procurement order, resulted in avoidable payment of ₹ 918.61 crore towards grade variation

Whenever the Company did not receive the ACQ of coal from MCL, to meet the requirement of Dr. NTTPS, it used to divert coal from other plants i.e., KTPS[28] and RTPP.

As KTPS came under Telangana State and Dr. NTTPS came under Andhra Pradesh, diversion of coal from KTPS to Dr. NTTPS was not possible. In view of this, for the year 2014-15, to meet the requirement of coal at the Power Station (Dr.NTTPS), the Company procured 27.61 LMT of coal from SCCL at premium price (e-auction weighted average price) by placing order on 26 July 2014. This order was placed without incorporating any clause for joint sampling of coal and under-loading/over-loading freight charges. The Company had also not incorporated any clause for price adjustment, in case SCCL failed to supply the grades (Grade 7-15) mentioned in the Order. During 2015-16, without any purchase order/ MoU, the Company procured 63.5 LMT of coal from SCCL at premium price.

On review of 'coal analysis reports' and coal invoices for the years 2014 to 2016, it was observed that the Company had received coal with grade variance i.e. grades of the coal received by the power station did not match the grades indicated in the invoices. The details of the quantity of coal received along with value of ungraded coal and coal with grade variance are indicated below:

Table 2.1: Quantity of coal received with grade variation

Year	Quantity received (LMT)		Value (₹ in crore)	
	Ungraded	Grade variation	Ungraded	Grade variation
2014-15	15.57	6.08	308.90	42.26
2015-16	18.87	29.50	393.48	173.97
Total	34.44	35.58	702.38	216.23

Source: Company records

As seen from the above table, the Company had received 35.58 LMT (39 *per cent*) of varying grades of coal valued at ₹ 216.23 crore from SCCL. Besides, during the same period, the Company had also received 34.44 LMT (38 *per cent*) valued at ₹ 702.38 crore of ungraded coal.

Audit reviewed the FSA of another power station (RTPP) for supply of coal by the same supplier (SCCL) and observed that the FSA included a clause stipulating that SCCL was not to supply ungraded coal (i.e. below the grade of G15). If ungraded coal was supplied, it would not carry any basic price of the

[28] Kothagudem Thermal Power Station- KTPS was under the purview of APGENCO till bifurcation of the State of Andhra Pradesh and after bifurcation of the State, the power station came under the purview of Telangana State Power Generation Corporation Limited.

coal and carry only other charges and statutory levies. The agreement also included a clause for 'joint sampling of coal inspection' and in case of dispute with regard to grade of the coal, it was to be referred to a third party (referee) and decision of the party would be final. It was observed that though the Company was aware of the clause, it failed to incorporate the same in the Supply Order placed on SCCL. In the absence of the clause, the Company could not claim ₹ 918.61 crore, towards ungraded and differential grades of coal during the years from 2014 to 2016.

It is pertinent to mention here that the Company, while entering into MoU with SCCL for 2016-17, incorporated a clause for joint sampling.

The Government in their reply stated (October 2016) that due to requirement of coal, the Company requested SCCL to supply coal on *ad-hoc* basis with weighted-average e-auction/premium price. The Company was addressing SCCL for supply of invoice grade coal to avoid grade slippage. It was also stated that SCCL was requested (August 2016) to carry out joint sampling of coal by appointing a third party.

The Government accepted the audit observation and incorporated a suitable clause in MoU with SCCL for the year 2016-17.

(b) Avoidable payment of ₹ 19.94 crore due to absence of suitable clause relating to weighment charges

Audit reviewed the FSA with SCCL for procurement of coal to RTPP and observed that a clause in respect of payment of overloading and underloading charges was included. As per the FSA, if SCCL transported coal after weighment at their loading point by charging ₹ 25 per MT towards weighment charges, the overloading and underloading charges will be borne by SCCL. If weighment is not done, underloading charges will be borne by SCCL and overloading charges will be borne by the Company.

Audit observed that while procuring coal for Dr.NTTPS, from 2014 to 2016, the company had procured a quantity of 79.79 LMT of coal, under Supply order with SCCL without incorporating the above clause and paid ₹ 19.94 crore towards weighment charges to SCCL. On test check of supply records, it was seen that the Company paid overloading/underloading charges to Railways. However, due to absence of the clause, the Company could not claim the overloading/underloading charges from SCCL.

It is pertinent to mention here that the Company had entered into MoU with SCCL on 30 May 2016 for procurement of coal for both the units and included the clause for overloading and underloading charges.

The Government stated (October 2016) that due to requirement of coal, the Company requested SCCL to supply coal on *ad-hoc* basis with weighted average e-auction/premium price. It was further stated that the matter was being pursued with SCCL.

2.6.3 Diversion of coal resulted in avoidable expenditure

The Company procured coal in the name of a particular Power Station and the coal was transported to that Power Station only. If there was shortage of coal at another Power Station, the Company diverted coal from one Power Station

(for which the coal was originally booked) to another Power Station (Power Station to which the coal was diverted). If the distance of the diverted Power Station was more than the distance in respect of originally intended Power Station, the Company had to pay the additional freight charges to Railways for diversion of coal. If the distance was less, the Company claimed the differential freight (short distance) charges from Railways. But, this was to be allowed when the Company paid diversion fee of ₹ 300 per wagon. Due to improper monitoring of coal requirement at Power Station, the Company incurred avoidable expenditure as discussed in the succeeding paragraphs.

(a) Improper monitoring of coal requirements at power plants resulted in avoidable expenditure of ₹ 186.78 crore towards transportation cost

During 2011 to 2015, as the Company (RTPP) did not lift the coal from SCCL as per ACQ, there was shortage of coal at RTPP. To meet the shortage, the Company diverted coal from KTPS.

Year-wise details of the quantity of coal diverted and additional freight charges incurred are indicated below:

Table 2.2: Statement showing the difference in freight charges

Year	Quantity diverted (LMT)	Weighted Average Freight from mines to RTPP (MT/₹)	Weighted Average Freight on diversion of coal from KTPS to RTPP(MT/₹)	Difference in Freight (MT/₹)	Avoidable expenditure (₹ in crore)
1	**2**	**3**	**4**	**5(4-3)**	**6 (2x5)**
2011-12	21.39	753	1,116	363	77.64
2012-13	15.86	1,029	1,408	379	60.13
2013-14	6.69	1,118	1,507	389	26.01
2014-15	5.75	1,141	1,541	400	23.00
Total	**49.69**				**186.78**

Source: Company records

It could be seen from the above table that the freight charges from mines to RTPP was less than the freight charges on diversion.

It was observed that due to lack of proper monitoring of procurement of coal by power stations, the Company diverted the SCCL coal from KTPS to RTPP incurring avoidable expenditure of ₹ 186.78 crore on freight charges towards diversion of coal.

The Government in its reply stated (October 2016) that FSA quantity pertaining to KTPS was diverted to RTPP to meet the grid demand. Presently, the Company was continuously monitoring the movement of rakes as per the requirement of coal at power stations and no rebooking of rakes was being done.

(b) Lack of proper monitoring of procurement of coal resulted in loss of ₹ 98.36 crore

During August 2014 to March 2015, the Company had diverted 2.93 LMT (4,460 wagons) of coal from RTPP to Dr. NTTPS. As the distance from SCCL to Dr.NTTPS was less than the distance between SCCL to RTPP, the

Company claimed ₹ 24.13 crore (November 2014 & February 2015) towards differential freight from Railways. The Railways rejected the claim stating that the Company had not paid the diversion fee.

Audit observed that as the Company had failed to pay the diversion fees of ₹ 13.38 lakh, it had to forego the claim amount of ₹ 24.13 crore towards differential freight amount.

Audit further observed that during the same period (August 2014 to March 2015), 7.48 LMT of coal was diverted from Dr.NTTPS to RTPP and the Company incurred an extra freight amount of ₹ 74.23 crore. During the year 2014-15, due to diversion of coal, there was loss of power generation of 247.33 MU at Dr.NTTPS.

The Government stated (October 2016) that it had requested the Railways to adjust the diversion fee from the balance funds available with Railways and the same was being pursued constantly to settle the issue on priority. It was further stated that due to urgent requirement of coal at RTPP, the rakes after reaching the Dr.NTTPS were rebooked to RTPP to minimise the generation loss.

Thus, improper monitoring of procurement of coal resulted in avoidable expenditure of ₹ 98.36 crore due to diversion of coal from RTPP to Dr.NTTPS and vice versa during the same period.

2.6.4 Delay in operation of coal washery at Talcher

The Company had entered into an MoU (May 2004) for setting-up a 'coal washery' with a capacity of 11 Million Ton Per Annum (MTPA), in two phases (i.e., 7 and 4 MTPA in two phases) at Talcher (MCL mines), on Build, Own & Operate (BOO) basis, to M/s ST-CLI Coal Washery Ltd (presently M/s Spectrum Coal & Power Limited i.e., SCPL). The washery (phase-I) was established in 2009.

In the process of washing of coal at washery, "washed coal rejects" were also generated along with the "washed coal" which was the property of the Company. The Company entered (May 2004) into an Indemnity Bond (agreement) with MCL for supply of coal to washery. As per the Indemnity Bond, the Company or the sub-lessee should return the 'washed coal rejects' to the 'party' which supplied the coal. Despite the Company being the owner of the washery coal rejects, the MCL claimed the 'washery coal rejects' as the term 'party' in the Indemnity Bond was not clearly defined.

The Company had requested (October 2014) the Ministry of Coal (MoC) to give necessary directions to MCL to accept a revised Indemnity Bond. MoC intimated (January 2015) the Company that the matter was referred to Ministry of Law for legal opinion. Ministry of Coal advised the Company to ensure the operation of washery, as an interim arrangement and that the coal rejects should be delivered to MCL. In view of dispute with MCL relating to ownership of coal rejects, even though the washery (phase-I) was established in 2009, the same was not operational till May 2015 i.e., for six years from completion of construction of the washery.

Due to the above dispute, the Company could enter (April 2015) into MoU with MCL for supply of coal to washery after a delay of six years. Thus

incorporation of faulty clause by the Company in the indemnity bond, led to non-utilisation of washery and also resulted in transportation of coal through RSR mode, which was costlier.

The Government stated (October 2016) that legal opinion was obtained in May 2014. Accordingly MCL and the Government of Andhra Pradesh were addressed/ requested for solving the issue. Further, the Company was also pursuing the issue of ownership of 'washed coal rejects'.

The reply of the Government was not acceptable as the Company had not taken the legal advice before entering into agreement and this resulted in keeping the washery idle for more than six years.

2.6.5 Underutilisation of washery resulted in extra expenditure of ₹ 17.47 crore

The washery established at Talcher commenced its operations from May 2015 onwards. Against the capacity of the washery of 82.5 LMT of coal, for the nine month period (July 2015 to March 2016) during 2015-16, the Company provided 14.41 LMT of coal for washing.

The coal is transported to the power stations through two modes of transportation viz., 'direct' and 'Rail-cum-Sea-cum-Rail' (RSR) modes. The coal from MCL was transported to the power stations by the washery (after washing) through 'direct' mode of transportation (all rail mode). The coal from MCL was also transported through 'RSR' mode, if the coal was not issued for washery. As per the Company's records on landed cost of coal, if the coal was transported through RSR mode, the transportation cost was more by ₹ 100 per MT when compared to the coal transported through washery i.e., 'direct' mode/through washery (after incurring the washery charges also).

Audit observed that though the washery had been functioning from July 2015, the Company failed to utilise the same to its full capacity. In view of this, the Company during nine months period (July 2015 to March 2016), had received 17.47 LMT of coal through 'RSR mode' i.e., without utilising the services of washery, incurring an additional expenditure of ₹ 17.47 crore on transportation.

The Government accepted (October 2016) the audit observation and stated that based on the performance and stabilisation of the washery, the capacity of the washery would be increased gradually and coal would be washed and transported through washery after washing the same. Further, the coal transportation by RSR mode has been discontinued from September 2016.

2.6.6 Acceptance of lower yield beneficiated coal

As per the guidelines of Ministry of Environment and Forest, the power generation companies have to use washed coal (beneficiated) for generation of power. The Company had placed orders (2011 to 2016) on contractors for washing of coal with a guaranteed yield of 73.5 *per cent* of raw coal supplied by MCL from Jagannath and Bharatpur mines. After beneficiation of coal at the washery, contractors transported the same to the Company for use in generation units.

Asian Development Bank (ADB) had conducted a sectoral study on 'India-implementation of clean technology through coal beneficiation' in respect of the coal sector in India to advise Government of India on improving usage of washed coal in thermal power plants to reduce pollution. As per the study report, on washing of coal from Jagannath and Bharatpur mines, the yield was 76.2 and 81.5 *per cent* respectively.

Audit observed that despite higher yield in respect of both the mines, the Company had placed orders for lower yield (73.5 *per cent*) and received 3.20 LMT (2011 to 2016) less valued at ₹ 136.07 crore. Thus, placement of orders for lower yield with the washery contractors was not in the interest of the Company and this had resulted in extension of undue benefit to the Contractors.

The Government stated (October 2016) that the cost of washed coal was minimum at the yield of 73 *per cent*. However, orders were placed for a yield of 73.5 *per cent*. As per the directions of MoC, Performance Guarantee Test would be conducted and the yield would be decided accordingly.

The reply was not acceptable as the Company was also a party in framing the policy by ADB for use of washed coal. Therefore, it should have considered the yield as per ADB report while placing the washery contracts.

Procurement of Imported coal

2.6.7(a) Procurement of imported coal in deviation from the purchase policy

As per the Company's Purchase Policy (8.3.21), repeat orders are to be placed (i) within 6 months from the date of supply of original order; (ii) total quantity should not exceed 50 *per cent* of the originally ordered quantity and (iii) repeat order should not be placed for more than once.

The Company placed orders for procurement of imported coal on M/s Metal Scrap Trade Corporation Limited (MSTC) and M/s. Projects & Equipment Corporation Limited (PEC) for its requirement on 'Free on Rail/Road' (FOR) destination basis on firm price basis. The following points were observed.

- Though the Company (RTPP) had placed an order (June 2013) on MSTC for supply of 4 LMT of imported coal, six repeat orders were also placed during March 2014 and March 2015 for a quantity of 9.75 LMT i.e., 244 *per cent* of the originally ordered quantity.
- Similarly, the Company (Dr. NTTPS) had placed an order (April 2011) on MSTC, for supply of 2.6 LMT for imported coal. Three repeat orders (July 2011 to September 2011) were also placed for additional quantity of 2.6 LMT i.e., 100 *per cent* of originally ordered quantity.
- The Company had also placed an order (June 2013) with PEC for supply of 8.0 LMT for imported coal. Five repeat orders were also placed during March 2014 and November 2014, for a quantity of 9.50 LMT (119 *per cent*).

The Government stated (October 2016) that due to low stock levels and poor response to the tenders floated during the time and also time required for

finalisation of new tenders, repeat orders were placed after taking the approval of Board.

However, it may be noted here that the Ministry of Power, GoI, while fixing the year wise targets of imported coal, had directed (April 2011) the power utilities to take necessary action to tie up for import of coal well in time and place the orders expeditiously.

(b) Non-levy of penalty for delayed delivery

The Company had placed an order (June 2013) on MSTC for procurement of 4 LMT of imported coal. As per the terms and conditions of the Order, MSTC had to supply the quantity within six months from the date of issue of order/commencement of supplies. Against the ordered quantity of 4 LMT, MSTC had supplied 2.89 LMT within the stipulated delivery period. The Company had also placed repeat order (November 2014) on MSTC for additional 2 LMT of imported coal. As per the terms and conditions of the repeat order, MSTC was to supply the quantity within forty five days from the date of issue of order/commencement of supplies. Against the repeat order, M/s MSTC supplied 1.32 LMT only within the stipulated delivery schedule. As per the terms of the Order, if the supplier failed to supply the scheduled quantity, penalty of 0.5 *per cent* (per week) subject to a maximum of 5 *per cent* of total contract value, was to be levied towards Liquidated Damages.

However, based on the request of MSTC, the Company extended the delivery period in respect of both the orders (regular and repeat order) without levy of penalty amounting to ₹ 2.03 crore.

Audit observed that due to short supply of coal by the contractor (MSTC), the Company (RTPP) could not maintain sufficient coal stock levels which resulted in loss of generation of 169.07 MU during the above period.

The Government stated (October 2016) that MSTC had informed that berthing delays at Krishnapatnam port and non-availability of rakes adversely affected the coal supply. The Board accorded approval for extension of delivery period without any penalty since MSTC was a Central PSU and also to have better contractual relations.

However, as per the terms and conditions of the Orders, it was the responsibility of the supplier to facilitate all activities at port, liaison with Railways for rakes and supply coal to power stations on destination basis.

Transportation of coal

Freight is one of the major component**s** of cost of coal. Coal from SCCL was transported by rail and from MCL by i) all rail route and ii) Rail-cum-Sea-cum-Rail (RSR) mode from Paradip port to Kakinada port for Dr. NTTPS and from Paradip port to Krishnapatnam port for RTPP. For transportation of coal by RSR mode to power stations, the Company placed contracts with private contractors. The Company made e-payment of Railways freight for the dispatch of coal from MCL (Talcher) to power stations (Dr. NTTPS / RTPP).

2.6.8 Avoidable expenditure on ocean freight and port charges.

a) The Company procured coal from MCL. In respect of Dr. NTTPS, coal was transported from Paradip port to Dr. NTPPS via Kakinada port. The distance from Paradip port to Kakinada port is 370 nautical miles. In respect of RTPP, the coal was transported from Paradip port to RTPP via Krishanpatnam port. The distance from Paradip port to Krishnapatnam port is 652 nautical miles.

Audit observed that Dr. NTTPS had been paying ocean freight charges at the rate of ₹ 969.22 per MT for 370 nautical miles, whereas, RTPP was paying ocean freight charges at the rate of ₹ 910.43 per MT for 652 nautical miles.

Thus, though the distance from Paradip port to Kakinada port was lesser than the distance from Paradip port to Krishnapatnam port, the Company was paying ocean freight charges at higher rates (₹ 58.79 per MT) for transportation of coal to Dr.NTTPS.

The Government accepted the audit observation and stated (October 2016) that action was being taken to minimise the ocean freight.

b) The Company transported coal from Paradip port to RTPP via Krishnapatnam port. The Company had engaged (July 2013) KPMG, a consultancy firm, to study the existing coal transportation system of the Company and suggest the most optimal transportation method. KPMG submitted (March 2014) its report suggesting that the port charges at Ennore were significantly lower when compared to port charges at Krishnapatnam port. KPMG advised that transportation of coal would be cheaper if the coal was transported from Ennore port instead of Krishnapatnam port.

Audit observed that the distance from Paradip port to Ennore port (721 nautical miles) was more than the Paradip port to Krishanpatnam port. Tamil Nadu Power Generation Distribution Corporation Limited (TANGEDCO) had been transporting coal from Paradip port to Ennore port by paying ocean freight charges at the rate of ₹ 347 per MT. However, the Company had not initiated action to transport coal through Ennore port to RTPP to minimise the ocean freight charges.

The Government accepted the audit observation and stated (October 2016) that negotiation was being done with coal transport contractors for reduction of ocean freight. Besides, M/s. Shipping Corporation of India would also be contacted for transporting coal.

c) During test check of records for the year 2015-16, it was seen that the Company had paid ₹ 696.93 per MT towards port charges at Krishnapatnam port. However, MMTC had paid ₹ 514.76 per MT towards port charges at the same port for transportation of imported coal for the Company.

Audit observed that the Company was paying port charges at rates higher than MMTC at Krishnaptanam port, resulting in extra expenditure of ₹ 20.98 crore which was avoidable.

The Government accepted the audit observation and stated (October 2016) that the contracts were awarded on the basis of lowest prices. Besides, M/s. Shipping Corporation of India would also be contacted for transporting coal.

2.6.9 Delay in unloading of coal from wagons resulted in avoidable payment of demurrage of ₹112.66 crore.

The Company depended mainly on Railways for transportation of coal. The Railways allowed seven hours of free time for unloading of coal from wagons beyond which demurrage charges were levied. The details of number of rakes received and number of rakes on which demurrage charges paid to Railways during the period from 2011 to 2016 are as follows:

Table 2.3 Demurrage charges paid to Railways

(₹ in crore)

Year	Total rakes received (No.)	Number of rakes on which demurrage charges paid (No.)	Demurrage charges levied (₹)	Demurrage charges waived by Railways (₹)	Demurrage charges paid (₹)
2011-12	4,086	2,358	10.19	4.41	5.79
2012-13	3,945	2,882	24.54	10.73	13.81
2013-14	3,702	3,135	68.60	25.78	42.82
2014-15	4,093	3,189	34.42	12.54	21.88
2015-16	4,073	3,679	59.02	30.66	28.36
Total	**19,899**	**15,243**	**196.77**	**84.12**	**112.66**

Source: Company records

The Company had paid ₹ 112.66 crore towards demurrages during the above period. The demurrages increased from ₹ 5.79 crore in 2011-12 to ₹ 28.36 crore in 2015-16.

Audit observed that till 2014-15, though new units (Dr.NTPPS-unit-VII-January 2010, RTPP-unit-V-February 2011) were commissioned, the Coal Handling Plants (CHPs) were not augmented to handle additional coal in tune with the additional capacity. Due to this, demurrages paid by the Company increased year after year.

During 2015-16, even after manual unloading of coal from wagons by incurring expenditure of ₹ 162.09 lakh, demurrage charges increased due to non-availability of stock yard to stack the required coal to cater to the needs of all the units of the Power Stations.

Even though augmentation of CHPs was mooted, the same was deferred (July 2012) by the Company on the ground that it would be done along with future expansion of the Power Stations.

The Government in its reply (October 2016) stated that strengthening the Coal Handling Plant by providing additional wagon tipplers and stream of conveyors were envisaged in the upcoming 800 MW Super Critical plant at Dr. NTTPS. All efforts were being made to minimise the demurrage charges despite system constraints.

The Government's reply was not acceptable as the proposal for augmentation of CHP in respect of Dr.NTTPS was deferred and while envisaging the new unit of RTPP, the Company had not envisaged CHP. Inadequate unloading facility in CHP and inaction by the Company to augment the CHPs even after

commissioning of new units resulted in avoidable demurrage charges of ₹ 112.66 crore during the period from 2011 to 2016.

2.6.10 Waiver of ₹ 7.33 crore towards penalty for delay in transportation of coal.

The Company awarded contracts to M/s South India Corporation Limited and M/s Sarat Chatterjee & Company for transportation of 6 LMT of coal by each contractor from MCL to Dr. NTTPS by RSR mode. As per the agreement (Clause 6), the contractor had to transport the monthly scheduled quantity to Dr. NTTPS within 35 days from the date of commencement of transportation from MCL. In case of delay in transportation, penalty was to be levied at the rate of 1.5 *per cent* per week (subject to a maximum of 5 *per cent* of the total contract value) on the awarded rate per ton of the quantity for short supply of coal after expiry of 35 days. As per clause-1.10 of the special terms and conditions of the tender specifications, the contractor would not be liable for delay in transportation of coal on account of *force majeure*. In case of force majeure, the contractor was to, within 10 days from the day of such delay, if any, inform the Company in writing explaining the causes for delay. Based on this information, the Company was to verify the credentials of delay and grant extension of time, if eligible.

As per the contract, the Contractors were to complete the transportation of coal by July 2011. However, the coal was supplied till January 2012. Hence, the Company recovered ₹ 3.04 crore from M/s. South India Corporation Limited and ₹ 4.29 crore from M/s Sarat Chatterjee & Company for delay in transportation of monthly scheduled quantity beyond the stipulated time.

After completion of the transportation of coal during January 2012, the contractors intimated (M/s South India Corporation Limited in August 2012 and M/s Sarat Chatterjee & Co. in June 2012) the Company, the reasons such as non-supply of coal by MCL, strikes and rail roko by the local villagers at Talcher, frequent downpours in Paradip and Kakinada ports during September – December (2010) and non-supply of empty rakes by Railways etc. for non-adherence to the monthly scheduled quantity.

Based on the request of the contractors, the Management waived the penalties of ₹ 7.33 crore stating that the Railways had failed to provide sufficient number of rakes as a result of which the transportation of coal was low. It was also observed that the refunds of penalties were made without approval of the Board. The Board had not ratified the decision to waive the penalty till date (March 2016).

The Government in its reply (October 2016) stated that the contractual quantity was transported by the contractors. However, there was a delay in transportation of coal to the power station due to insufficient number of rakes provided by Railways. In view of this, the Management had considered the request of both the contractors for waiver of penalties for delay in transportation.

The Government's reply was not acceptable as the Company's decision to waive the penalty without adhering to the terms and conditions of the contract and without approval of the Board resulted in extension of undue favour to the contractors to the tune of ₹ 7.33 crore.

Quality Assurance

2.6.11 Absence of Joint Sampling

Coal is classified into different grades on the basis of Gross Calorific Value (GCV)/grade. Accordingly, the prices of the coal, based on the grade / quality of coal, are notified by the collieries. The quality of coal supplied by the coal companies is determined on the basis of joint sampling of coal (by representatives of seller and purchaser) at loading point.

FSAs incorporated a clause for joint sampling of coal quality and, in case of dispute in quality, the referee's (third party) decision was to be final. The clause also stated that in case of absence of the representative from either side, the sampling was to be carried out unilaterally by the representative of the other party and such sample would be deemed to have been jointly collected and binding on both the parties.

The Government of India had formed (June 2014) a committee with representatives from Power utilities and CEA and notified a panel of agencies for conducting joint sampling of coal at loading end.

Though the power stations had been receiving ungraded coal and coal with grade variation, the Company had not appointed its representative for joint sampling as of March 2016.

The points observed during the audit are discussed in the succeeding paragraphs.

a) SCCL

From a test check of analysis reports for the years 2014 to 2016 conducted by the Company (RTPP), it was seen that there were differences between the grades supplied by SCCL and the grades as per the analysis conducted by the Company. Out of 65.81 LMT of coal received from SCCL, there was variance in grade in respect of 33.39 LMT (51 *per cent*).

Further, as per FSA, if coal received was less than G15 (GCV 2,800 kCal/kg) i.e., ungraded, it would not carry any basic price but only other charges and statutory levies. It was observed that though 23.71 LMT (36 *per cent*) of ungraded coal valued at ₹ 443.17 crore was received during the same period, the same was paid for at higher grade price.

b) MCL (IB Valley mines)

i. As per the FSA (MCL), if the quality of the coal received was less than GCV 2,200 kCal/kg, ₹ 1/- (Rupee one) per MT only was to be charged by the supplier towards the cost of the coal but other charges and statutory levies were to be paid by the Company. It was observed that no representative was appointed by the Company for joint sampling of coal at MCL (IB Valley mines).

   Test check of analysis reports for the years 2013 to 2016 conducted by the Company (Dr.NTTPS) showed that there were differences between the grades indicated by MCL and the grades as per the analysis conducted by the Company. Out of 11.46 LMT of coal received from MCL, there was

variance in grade in respect of 7.99 lakh MT (70 *per cent*). Despite this, the Company paid an amount of ₹ 97.83 crore.

Further during the same period, audit observed that the Company (Dr.NTTPS) also received 1.35 LMT (12 *per cent*) of ungraded coal (lower than GCV 2,200 kCal/kg) valued at ₹ 8.91 crore. As the Company had not limited the value of coal to ₹ 1/- per MT, it incurred an extra expenditure amounting to ₹ 8.90 crore.

ii. Similarly, during 2014-15 and 2015-16, the Company (Dr. NTTPS) received 14.43 LMT of coal valued at ₹ 158.53 crore with differential GCV (other than IB valley mines of MCL). As per the analysis by MCL, the coal supplied was of the GCV of 3,401- 4,000 kCal/kg. However, during the period, on analysis by the Company, it was found that coal with GCV of 1,531-3,700 kCal/kg was also received by the Company. However, the Company did not claim the difference in price for variation in coal grade for reasons not on record.

c) Western Coalfields Limited (WCL)

The Company entered (July 2014) into a Memorandum of Understanding (MoU) with WCL for procurement of coal. As per MoU, the Company had to appoint its representative at loading point of WCL for joint sampling of coal. The Company procured 6.20 LMT of coal under this MoU.

It was seen that the Company had not appointed any representative at loading point of WCL for joint sampling for reasons not on record. Thus, the Company's claim for ₹ 59.03 crore towards grade variation was not considered by WCL on the ground of absence of the Company's representative for joint sampling.

d) Difference in average GCV of invoiced/received coal and average GCV of bunkered coal

As per norms of Central Power Research Institute (CPRI), the difference in GCV between the received coal (invoiced) and at the consumption end (bunkered coal) should be within 150 kCal/kg.

As per FSA between the Company and MCL /SCCL, joint sampling of coal was to be conducted by appointing representatives from both the parties. However, the Company did not appoint its representative in MCL (IB Valley mine) and SCCL for joint sampling.

Audit observed that the difference between the average GCV of invoiced coal and the average GCV of bunkered coal in the Thermal Power Stations was very high and ranged from 691 - 927 kCal/ kg at Dr. NTTPS and from 841 - 1128 kCal/ kg at RTPP.

The difference in the GCV as per the invoiced coal and the bunkered coal was on account of absence of automatic sample collection of coal/ absence of the Company's representative for joint sampling of coal at SCCL/MCL (IB Valley mines)/ WCL. Due to this, the Company received inferior quality of coal which resulted in excess consumption. Even though joint sampling was done by the company at MCL (other than IB Valley mines), the company did not

claim the differential cost (difference of grade between invoiced and received) for reasons not on record.

Audit further observed that the Company had neither analysed reasons for difference in GCV nor taken any steps to bring it down within the CPRI norms. Audit worked out the excess consumption of coal at 86.02 LMT, due to difference in GCV i.e., in excess of 150 kCal/kg (invoiced and bunkered) valued at ₹ 3,179.32 crore during 2011-16.

The Government accepted the audit observation and stated (October 2016) that the grade slippage problem was being faced by all power generating companies and even with joint sampling as per FSA/MoU, grade variation was observed between the invoiced grade and received grade. The Company also stated that it conveyed its consent (August 2016) for signing of Tripartite Agreement with coal companies for carrying out a 3rd party sampling at loading points.

However, the Company did not take any action to appoint representative for joint sampling. Further, though Coal India Limited had notified a panel of agencies for conducting joint sampling of coal at loading end during August 2014 itself, the company did not finalise appointment of representative for joint sampling at loading point.

Consumption of coal

Each Thermal Power Station is designed for using a particular grade of coal. Using the envisaged grade of coal ensures optimisation of generation of power and economy of cost of generation.

2.6.12 Non-compliance with Ministry of Environment and Forest guidelines on use of washed coal

The process of washing raw coal of inferior quality at washery in order to remove coal dust, stones and shells and cutting the coal into proper size is called beneficiation (also called coal washing). It reduces the ash content in coal, thereby helping in reduction of the pollution and maintaining a clean environment.

Ministry of Environment and Forest (MoEF) Notification (January 2014) had mandated use of raw/blended/beneficiated coal with ash content not exceeding 34 *per cent*, with immediate effect, in respect of RTPP. In respect of Dr.NTTPS, the notification was mandated with effect from January 2015. The MoEF also directed the power plants to submit quarterly compliance reports to the Ministry and Andhra Pradesh Pollution Control Board (APPCB).

It was seen that washed coal was not used at Dr. NTTPS despite the directions of MoEF. The Power Station used coal with ash content of more than 43 to 45 *per cent*, which resulted in high generation of ash. In respect of RTPP, though the Power Station has been using the washed coal with 34 *per cent* ash content, the average ash content ranged from 43 to 44 *per cent.* This was due to blending of SCCL coal with high ash content with imported coal with low ash content. Further, the Power Stations did not submit the quarterly reports to the Ministry and APPCB.

The Government accepted the audit observation and stated (October 2016) that washed coal with ash content of less than 34 *per cent* was being utilised from August 2016 at Dr. NTTPS. In respect of RTPP, suitable blending of imported coal with SCCL coal was being applied before consumption of coal. The quarterly returns to APPCB and Ministry of Environment and Forest, in respect of average ash content in coal, would be submitted.

2.6.13 Improper blending of imported coal with indigenous coal

The Company procured imported coal having GCV of 6,000 kCal/kg for its use in Power Stations. To achieve higher generation, the Company decided to blend imported coal with indigenous coal in the ratio of 30:70.

For the years 2011 to 2013, the Company had maintained the records in conventional system. After introduction of ERP[29] during 2013-14, the Company was in the process of migration of data to the new system and was able to furnish records for 2014-15 only.

Audit test checked the records of the Company (Dr.NTTPS and RTPP) for the year 2014-15 and observed that at Dr.NTTPS, the imported coal was not blended (30 *per cent*) with the indigenous coal (70 *per cent*), even though the Board had directed (September 2011) the power stations to blend imported coal. On review of 'daily consumption records of coal' it was observed that the percentage of blending with indigenous coal ranged from 2 to 79 *per cent* and from 1 to 100 *per cent* in respect of Dr.NTTPS and RTPP respectively. This was due to lack of a proper system for blending of imported coal with indigenous coal in the required percentage.

However, due to non-availability of data, audit could not assess the impact of blending of imported coal with indigenous coal on generation of power.

The Government accepted the audit observation and stated (October 2016) that there was no blending equipment at power stations and the power plants were not designed to mix the imported coal and indigenous coal in the ratio of 30:70. Blending of coal exactly in the specified ratio was expensive. Company further stated that it had decided (August 2016) not to use imported coal for its power stations in view of improved domestic coal supply.

2.6.14 Non-procurement of WG-G9 grade from SCCL

The Company had procured 27.61 LMT and 63.5 LMT of coal (without placing order) with different grades (including G9 grade) at premium prices from SCCL during the years 2014-15 and 2015-16, respectively. Washery Grade- Grade 9 (WG-G9) met the requirement of designed GCV of Dr.NTTPS.

On a test check of invoices of WG-G9 and G9 grades of coal received from SCCL during 2015-16, it was observed that SCCL had supplied washery grade (WG-G9) coal to Dr.NTTPS at a price of ₹ 2,669 per MT. The Company, instead of procuring the WG-G9 grade of coal, procured only G9 coal (not washery grade) at a premium rate of ₹ 2,775/MT, for reasons not on record.

[29] Enterprise Resource Planning (ERP) software is the name of the package supplied by a Company i.e., SAP

Besides, though the Company had procured G9 grade coal at a premium rate, it received much lower grade coal of lesser GCV and not the G9 grade mentioned in the invoice. Thus, the Company failed to procure WG-G9 grade which gave guaranteed GCV, without any oversized stones and foreign material and paid higher prices for lower grades.

The Government accepted the audit observation and stated (October 2016) that the SDSTPS (a JV of the Company) had entered into a MoU with SCCL for procurement of WG-G9 grade of coal at a price of ₹ 2,778 per MT during the year 2015-16 and the price was reduced to ₹ 2,256 per MT during 2016-17. The Company would examine the cost economics of the coal and take necessary action.

2.6.15 Avoidable payment of ₹93.84 lakh on water cess.

As per the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977, water cess was to be paid as per the rates specified. As per the Environment (Protection) Act, 1986, a consumer was eligible for concessions and rebates on water charges if the consumer complied with pollution norms as specified by the Andhra Pradesh Pollution Control Board (APPCB).

Audit observed from the records of the RTPP that it was complying with the pollution norms of APPCB. However, the Company paid water cess at normal rates i.e., without any concession. This resulted in avoidable payment of ₹ 93.84 lakh (2011-16) towards water cess. Besides, the power station could not avail of the rebate (at the rate of 25 *per cent*) on water cess amounting to ₹ 23.46 lakh (2011 to 2016).

In respect of Dr. NTTPS, the Suspended Particulate Matter (SPM) values in stack emissions had exceeded the norms due to usage of poor quality of coal. Thus, due to higher levels of pollution, it could not avail of concessional rate of water cess.

The Government accepted the audit observation and stated (October 2016) that in respect of Dr. NTTPS, measures were taken from time to time to comply with the norms. In respect of RTPP, the Company stated that it would represent to APPCB for consideration for payment of water cess at concessional rates.

Ash Management

Ash is the residue after combustion of coal for generation of power in coal based Thermal Power Stations. A portion of the ash, around 20 *per cent*, is collected as 'bottom ash' at the bottom of the furnace. Another portion, around 80 *per cent* is collected as 'fly ash' in the Electrostatic Precipitators (ESP)'. This has to be collected and disposed off without letting it out into the atmosphere. Undisposed 'bottom ash' and 'fly ash' are collected as 'pond ash' into a pond. Ash management assumes significance as ash generated from the power plant is a threat to the environment. However, it has some value due to its various uses viz., in road laying and brick industry etc.

2.6.16 *Fly ash not used within the stipulated period of five years as per Ministry of Environment and Forest notification*

Fly ash is a valuable resource and raw material for cement, concrete and many other high value added applications. The utilisation of fly ash for part substitution of cement in concrete/mortar etc. necessitates setting up of an efficient system of fly ash collection which is economic, effective and eco-friendly.

As per Ministry of Environment and Forest Notification (November 2009), 100 *per cent* fly ash generated from existing units is to be utilized within five years from the date of notification i.e., by October 2014 and within four years by new Units i.e., by January 2015 and February 2016 for Dr.NTTPS-IV and RTPP-III, respectively.

The quantum of ash generated and utilised in respect of both the Thermal Power Stations of the Company during the period 2011 to 2016 are detailed below:

Table 2.4: Generation and utilisation of fly ash

(Figures in LMT)

Year	Coal consumed	Ash generated	Ash utilised	Ash utilisation in percentage
2011-12	152.87	63.02	39.85	63.23
2012-13	149.42	61.87	45.44	73.44
2013-14	145.71	60.47	42.92	70.98
2014-15	149.35	64.21	40.60	63.23
2015-16	145.29	64.91	43.37	66.82
Total	**742.64**	**314.48**	**212.18**	**67.46**

Source: Company records

During the years 2011 to 2016, the Company had utilised only 67.46 *per cent* of fly ash. During the years 2012-13 and 2013-14, the Company increased the utilisation of ash for laying roads for National Highways. Even after a lapse of six and half years of issue of Notification, the Company has not been able to utilise 100 *per cent* fly ash as per the directions of MoEF.

The Government accepted the audit observation and stated (October 2016) that measures were being taken and action plan prepared for 100 *per cent* utilisation of ash.

2.6.17 *Loss of revenue on Cenosphere*

A small proportion of the pulverized fuel ash produced from the combustion of coal in Power Stations is formed as Cenosphere. It is estimated that Cenosphere is present to an extent of one *per cent* in fly ash from thermal stations as per Andhra Pradesh Industrial Technological Consultancy Organisation (APITCO). It is commercially useful as an extender for plastic compounds, being compatible with plastisol, thermoplastics, latex, polyester, epoxies, phenolic resins, and urethanes. Synthetic foams are also made with Cenosphere. It is compatible with cement and other building materials such as coatings and composites. It is used in a wide variety of other products,

including sports equipment, insulators, automobile bodies, marine craft bodies, paints and fire and heat protection devices.

During 2011 to 2016, the two TPSs had produced 314.48 LMT of ash which should have contributed 3.14 LMT (one *per cent*) of Cenosphere. The Company has not sold any quantity of Cenosphere so far (March 2016). The Kothagudem Thermal Power Station (Thermal Power Station of Telangana State Power Generation Corporation Limited) sold it at a rate of ₹ 14,360 per MT. The Company did not make any arrangements for collection of Cenosphere, which has high demand and value in the market and could have earned more revenue for the Company.

The Government in its reply (October 2016) stated that the Company would explore the options for collection and sale of Cenosphere.

2.6.18 Non-compliance with Ministry of Environment and Forest guidelines on revenue realized from sale of fly ash.

As per Ministry of Environment and Forest Notification (November 2009), the amount collected from sale of fly ash and fly ash based products should be kept in a separate account. It should be utilised only for development of infrastructure or facilities, promotion and facilitation activities, until 100 *per cent* fly ash utilisation level was achieved.

It was seen that the Company had earned revenue of ₹ 233.98 crore by selling the fly ash during 2011 to 2016 and kept it in a separate account as per MoEF guidelines.

However, it was observed that in contravention of guidelines of MoEF, the Company had diverted ₹ 6.36 crore for other activities viz., renovation of guest house at Power Stations, construction of school compound wall and flooring of badminton court.

In compliance with the guidelines of MoEF, TPSs had transferred the amount received on sale of fly ash to separate bank account of the Company on monthly basis. The Company utilised ₹ 77.98 crore only for development of infrastructure or facilities, promotion and facilitation activities related to increase in the utilisation of fly ash activities. The remaining funds were diverted to meet the day to day working capital requirements, which was in violation of MoEF guidelines. This was evident from the fact that bank account relating to the amount realised on sale of fly ash showed a balance of ₹ 10,000 only as on 31 March 2016.

The Government accepted the audit observation and stated (October 2016) that in view of the urgent requirement of guest houses, other works and paucity of funds, the funds were diverted from fly ash account. It was further stated that as and when funds were available, the Management would transfer the funds to the fly ash account along with interest.

Inventory Management

Inventory management seeks to ensure enough inventories so as to aid unimpeded generation and to avoid excessive inventory to reduce locking up of funds. It also seeks to maintain the quality of stock.

The Company had no inventory policy on fuel to achieve the aforesaid objectives. It was observed that inventory assessment, planning and procurement were inadequate and ineffective and this resulted in loss of generation and also accumulated stocks of coal and oil, as discussed in the following paragraphs.

2.6.19 Loss of generation due to low stock levels of coal

As per the directions of CEA, each Power Station was required to maintain its coal stock levels. In this regard, Dr.NTTPS and RTPP were required to maintain a stock level of 20 and 25 days, respectively. High stock levels may cause reduction/deterioration in GCV. It may also cause loss due to winds and shrinkage, apart from utilisation of additional space and blocking of funds. Low stock levels may result in loss of generation. Hence, the Company had to carefully assess the requirement of coal, based on the generation capacity and maintain sufficient coal stock levels.

Audit observed that against the CEA norms, during 2011-12 to 2014-15, the average stock levels maintained by the Power Stations of the Company ranged from 3 to 5 days (Dr. NTTPS & RTPP). During the year 2015-16, the average stock levels maintained by the Power Stations of the Company were 18 days (Dr.NTTPS) and 30 days (RTPP), respectively. Further analysis of records showed that due to maintenance of low stock levels, during 2011-12 to 2014-15, the Company incurred loss of power generation of 721.59 MU. The excess coal stock during the year 2015-16 was due to excessive coal procurement and non-regulation of coal supplies during planned and forced outages.

The Government accepted the audit observation and stated (October 2016) that efforts would be made to maintain required stock levels at all times. The Government further stated that a circular had been issued (September 2016) to power stations to maintain required stock levels.

2.6.20 Excess holding of oil stock resulted in blocking of funds of ₹ 16.89 crore

In case of low quality coal, oils are mainly used for start-up of the unit and to maintain the required heat. For procurement of these oils, the Company entered into agreements with public sector oil companies viz., Bharat Petroleum Corporation Limited (BPCL), Indian Oil Corporation Limited (IOCL) and Hindustan Petroleum Corporation Limited (HPCL). Oil companies raised the bills at the prevailing rates of oil at the time of delivery.

State Electricity Regulatory Commission (SERC) has fixed a norm of two months' consumption for stock holding for the purpose of reimbursement of interest on working capital. On review of the receipts, consumption and stock levels of oil, it was observed that the Power Stations were procuring oils without any assessment.

Against the norm of two months' consumption, the Thermal Power Stations were maintaining oil stocks ranging from one to nineteen months' consumption. Further, the Company had not fixed minimum, maximum and reordering levels based on the requirements of the plants to enable them to

keep the stock levels as prescribed. Lack of proper management of receipts and consumption and balance stock of oils not only resulted in overstocking but also led to blocking of funds to the tune of ₹ 16.89 crore as on March 2016.

The Government stated (October 2016) that the stock levels were dependent upon the actual operating and atmospheric conditions. However, audit observation would be taken into consideration for maintaining oil stocks at optimum level.

2.6.21 Non-stacking of oversized stones

Coal received from coal mines was stocked in the stockyard. As per FSAs of MCL and SCCL, the coal supplied by the seller should generally be free from oversized stones above 250 mm. These stones were to be segregated by the purchaser and equivalent cost along with Railways freight and surface transportation charges were to be paid by the seller. The purchaser was to demarcate a site for stacking of oversized stones and quantify the same. The purchaser was to notify the seller to inspect stones of more than 250 mm within 15 days, and after joint inspection, the stones could be disposed off.

Audit observed that though the power stations received big boulders/ foreign material, the same were not segregated for assessment/ joint inspection. Due to non-assessment of quantity of stones/ foreign material, the Company could not lodge claims for the same, resulting in financial loss to the company, the quantum of which could not be calculated by Audit.

The Government stated (October 2016) that it was not possible to segregate and stack stones as the coal was received from different mines. The collection and stacking of stones of sizes more than 250 mm were to be stored separately and weighment had to be done jointly with coal companies to prefer claims. All these activities were expensive and was not economical when compared to basic price of coal.

The Government's reply was not acceptable as the receipt of big boulders and foreign material had also caused delay in unloading of Railways wagons, resulting in increase in demurrage charges. Further, it also resulted in damaging the equipment of Power Stations.

2.6.22 Delay in disposal of coal mill rejects resulting in loss of revenue.

During crushing/grinding, the low quality or un-ground coal generated from the coal mills is called Coal Mill Rejects. The reasons for high mill rejects are insufficient air to mills, poor quality of coal, excess wear and tear of grinding media, exhaust fan blades and overfeeding of coal to mills which indicates poor maintenance of mills**.** Further, lack of regular overhauls result in excess mill rejects. These rejects are stacked in coal stock yard of the plant and are sold when accumulated.

During 2011-16, RTPP had generated 1.54 LMT of coal mill rejects and sold 1.01 LMT. It was observed that RTPP had incurred an expenditure of ₹ 142.76 lakh during the period towards removal, collection and cleaning of coal mill rejects and their transportation to stock yard. As the Company did not identify any separate stock yard for coal mill rejects, the coal rejects were dumped into crushed / uncrushed coal stock yard.

There was no separate stacking facility for mill rejects and the same was mixed with normal coal. In the absence of separate stacking facility, the possibility of lifting the normal coal by the contractors during lifting of mill rejects could not be ruled out. Further, the RTPP had written off the loss of mill rejects at the rate of 15 *per cent* without any physical verification or approval by the competent authority.

In respect of Dr. NTTPS, out of 86,270 MT of mill rejects, 57,081 MT only was sold. The Company spent ₹ 8.25 lakh on transportation of unsold / non-lifting of mill rejects from hopper to stock yard.

Thus, the improper system of stacking of mill rejects and delay in sale had resulted in loss of revenue of ₹ 7.20 crore (82,489 MT) during the period 2011-16.

The Government stated (October 2016) that the unsold stock was utilised for ground preparation for further stacking of raw coal in stock yard and due to non-finalisation of sale order, the mill rejects were not sold. Further, storage of mill rejects for longer period caused some losses in total quantity and some of the quantities were burnt down due to inherent temperature properties.

The Government's reply was not acceptable as the Company had failed to take action to dispose off the coal mill rejects immediately to avoid loss on account of natural spontaneous combustion.

2.6.23 Diversion of coal to Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS)

During the period of 2014-15 and 2015-16, the Company had diverted 28.66 LMT (18.68 LMT from RTPP and 9.98 LMT from Dr. NTTPS) washed coal and 1.46 LMT of imported coal to SDSTPS on returnable basis[30]. The SDSTPS returned only 1.09 LMT of washed coal to RTPP during the year 2014-15.

Audit observed that during the year 2014-15, the Company had diverted the coal without considering coal requirement at RTPP, which resulted in loss of generation of 335.55 MU. Further, the TPSs did not get the balance washed coal of 27.57 LMT and imported coal of 1.46 LMT (March 2016). This resulted in blocking of funds of ₹ 964.08 crore.

It was further observed that though as per guidelines of Ministry of Environment and Forest (w.e.f. January 2015), the Company was required to use coal with ash content of less than 34 *per cent*, Dr. NTTPS could not utilise the washed coal (with less than 34 *per cent* of ash content) due to diversion of the same to SDSTPS.

Thus, diversion of washed coal to SDSTPS lacked justification.

The Government stated (October 2016) that to meet the additional requirement of coal, based on request of APPDCL, washed coal was diverted to SDSTPS. It was further stated that the Company had stopped diversion of washed coal from Dr.NTTPS.

[30] The Company diverted coal to SDSTPS on the condition that the quantity of coal had to be returned

The Government's reply was not acceptable as the Company had not taken steps to get back the coal supplied to SDSTPS.

Energy Audit

2.6.24 Non-implementation of energy audit recommendations

As per Energy Conservation Act, 2001, all the power stations are required to carry out energy audit on regular basis for conservation of energy, detection of wastages and excess consumption of fuel and other consumables for taking remedial action. It was, however, observed that RTPP (Stage II & III) had not conducted any energy audit during 2011 to 2016. Further, the recommendations of energy audit conducted in respect of RTPP Stage-I (June 2012) were not implemented in full.

The Government accepted the audit observation and stated (October 2016) that action plan for implementation of recommendations was prepared and was under implementation.

Internal Control

2.6.25 Deficient internal control

Audit observed that internal control[31] system of the Company was deficient to the following extent:

- There was no proper mechanism to review the procurement and its utilisation according to the requirement.
- There was no mechanism to review the inventory levels of coal.
- Demurrage charges were not monitored for taking remedial action for reduction.

Acknowledgement

Audit acknowledges and appreciates the co-operation and assistance extended by the officers and the Management of the Company at various stages of conducting the Performance Audit.

Conclusion

The Company failed to plan the procurement of coal as per the FSA resulting in purchase of coal at higher rates. This also resulted in payment of incentive, non-recovery of penalty and diversion of coal. Non-monitoring of freight charges on transportation of coal resulted in incurring additional expenditure. Due to inadequate unloading facilities of coal at power stations, the Company incurred avoidable expenditure on demurrage charges. In the absence of effective joint sampling method, the Company received inferior grade of coal from coal companies. The washery contracts were finalised by accepting lower yield. This also resulted in excess consumption of coal. The Company

[31] Internal control is a process and a tool designed for providing reasonable assurance for efficiency of operations, reliability of financial reporting & compliance with applicable laws and statutes to ensure effective functioning as well as effectiveness of the internal control system and detection of errors and frauds.

did not adhere to the Ministry of Environment and Forest guidelines due to usage of non-washed coal with high ash content and also did not comply with the utilisation of fly ash. There was no system in place for sale of Cenosphere. Lack of inventory management system for fuel caused low and high levels of stocks which resulted in loss of generation and blocking up of funds.

Recommendations

The Company should

- ***Plan the procurement of coal as per FSA to avoid purchase of coal at higher rate and diversions,***
- ***Review the freight charges to minimize the same to reduce the fuel cost,***
- ***Take steps to appoint representative for joint sampling to avoid receipt of inferior grade of coal,***
- ***Review the washery contracts for obtaining higher yield on washed coal,***
- ***Adhere to Ministry of Environment and Forest guidelines for usage of washed grade coal and fly ash and***
- ***Evolve a policy to maintain optimum levels of fuel stocks to avoid loss of generation and blocking up of funds.***

In the Exit Conference the Government accepted the recommendations and assured of implementing the same.