

## CHAPTER 3 AUDIT FINDINGS

### 3.1 X Plan spill over projects

The Corporation planned to commission five units<sup>5</sup> of 1210 MW capacity during the X Plan period. However, only one unit i.e. MTPS Unit # 4 (210 MW) was commissioned during such period and the remaining four units were carried over to XI Plan period as detailed below:

*Table 1: Status of implementation of X Plan spill over projects*

| Project | Unit | Scheduled COD | Actual COD     | Delay (in months) | Projected cost | (₹ in crore)                |
|---------|------|---------------|----------------|-------------------|----------------|-----------------------------|
|         |      |               |                |                   |                | Actual Cost upto March 2014 |
| MTPS    | 5    | January 2007  | February 2008  | 13                | 2012           | 2172.60                     |
|         | 6    | March 2007    | September 2008 | 18                |                |                             |
| CTPS    | 7    | January 2007  | November 2011  | 58                | 2066           | 2590.68                     |
|         | 8    | March 2007    | July 2011      | 52                |                |                             |

#### 3.1.1 Meija Thermal Power Station Unit # 5 & 6 (MTPS 2 X 250 MW)

The order for construction of Main plant package (MPP) and other auxiliaries was awarded (June 2004) to BHEL on Engineering, Procurement & Construction (EPC) basis. The main reasons for delay were change in rating of Generator Transformer by the Corporation after 8 months from the date of placement of order, change in decision to remove vibration isolation system after 7 months of issuance of order, delay in finalization of drawings and construction activities of CHP (14 months).

Management stated (June 2014) that during detailed engineering, various issues related to sizing, rating of equipment like Generator Transformer, TG Vibration Isolation System/Conventional Foundation, etc. cropped up and were finalized after detailed analysis, deliberation and physical verifications etc. It was further stated that changes in layout at engineering stage were unavoidable for these extension units to take care of soil conditions, existing structures/facilities etc., which delayed the construction activities.

It would, thus, be seen that the DPR was prepared without adequate investigation and deficiencies were noticed after finalization of orders which resulted in delays.

Ministry accepted (February 2015) the audit observations.

#### 3.1.2 Chandrapura Thermal Power Station Unit# 7 & 8 (CTPS 2 X 250 MW)

The work of construction of MPP including Ash Handling Plant (AHP) and CHP was also awarded (June 2004) to M/s BHEL on EPC basis at a firm price of ₹ 1701 crore. Audit observed that the execution work initially suffered for 26 months due to delay in handing over the land to BHEL, non-availability of storage space for shipment of materials at site,

<sup>5</sup> MTPS Units # 4, 5 & 6 and CTPS Units # 7 & 8

local law and order problems, abnormal rise in price of steel and cement etc. In a tripartite meeting (November 2008) held among the Corporation, BHEL and CEA, it was decided to revise the milestones considering the initial delay of 26 months and accordingly the revised CODs of Unit # 7 & 8 were fixed as March 2009 and May 2009 respectively. It was subsequently agreed to pay one time compensation of ₹ 13.98 crore to BHEL towards increase in cost of civil works and erection services caused due to the delay.

It was also observed that though Unit # 7 achieved coal synchronization in September 2009, the COD was declared in November 2011 mainly due to the damage of the generator rotor which occurred in May 2010 and got replaced (April 2011) at an additional cost of ₹ 11.50 crore plus taxes. The Corporation formed two Committees at different times to find out the reasons for the rotor failure but was yet to fix the responsibility (March 2014).

Similarly in the case of Unit # 8, though coal synchronization was achieved in March 2010, the COD could be declared in July 2011 due to non-completion of Effluent Treatment Plant (ETP), water recovery system and dry fly ash collection system (DFACS) which delayed the statutory clearance from state pollution control board in addition to various problems encountered during operation such as Electric Hydro Converter (EHC) problems, Generator tripping etc.

The Corporation formed (March 2012) a committee to analyze the reasons for delay in completion of the project and found that out of the net delay of 27 months (excluding the initial delay of 26 months) 14 months is attributable to BHEL in respect of Unit # 7. The reasons for the balance delay could not be ascertained due to non-availability of investigation report of Generator rotor. In case of Unit # 8, the net delay attributable to BHEL was 28 months. However, a joint committee (Corporation and BHEL) had been formed (June 2013) for joint analysis of the reasons for delay in implementation of the project, the report of which was pending (March 2014). The management accepted (June 2014) the audit observations.

Ministry stated (February 2015) that contract reconciliation with BHEL was pending.

### 3.2 XI Plan Projects

The Corporation planned to commission nine units of 4700 MW capacity during the XI Plan period. However, only one unit i.e. MTPS Unit # 7 (500 MW) was commissioned and the remaining eight units were carried over to XII Plan period as detailed below:

Table 2: Status of implementation of XI Plan projects

| Project  | Unit | Capacity (MW) | Scheduled COD | Actual COD (upto March 2014) | Delay (in months) | Projected cost (₹ in crore) | Actual Cost upto March 2014 (₹ in crore) |
|----------|------|---------------|---------------|------------------------------|-------------------|-----------------------------|--|
| MTPS     | 7    | 500           | March 2010    | August 2011                  | 17                | 4617                        | 5363                                     |
|          | 8    | 500           | June 2010     | August 2012                  | 26                |                             |  |
| DSTPS    | 1    | 500           | August 2010   | May 2012                     | 21                | 4457                        | 5862                                     |
|          | 2    | 500           | November 2010 | March 2013                   | 28                |                             |  |
| KTPS     | 1    | 500           | June 2010     | July-2013                    | 37                | 4212                        | 6676                                     |
|          | 2    | 500           | Sept 2010     | Not Declared                 | NA                |                             |  |
| RTPS     | 1    | 600           | November 2010 | Not Declared                 | NA                | 4122                        | 6597                                     |
|          | 2    | 600           | Feb-2011      | Not Declared                 | NA                |                             |  |
| BTSP 'A' | 1    | 500           | Dec-2011      | Not Declared                 | NA                | 2260                        | 2481                                     |

Audit carried out a study on execution of projects proposed for the XI Plan to find out whether the Corporation had put in place appropriate mechanisms to ensure that the causes which delayed execution of the projects during the X Plan have been eliminated or minimized. Audit findings are discussed in the succeeding paragraphs.

### 3.2.1 Assessment of requirement of coal and linkage thereof

Based on the assessment of coal requirement, the Corporation explored coal linkage through MoP /CEA for coal supply to its thermal power stations. In addition, the Corporation also considered the availability of coal from its captive coal blocks already allocated by the MoC.

Audit observed that total requirement of coal for its capacity augmentation programme (seven thermal power stations including X Plan spillover projects) was 22.63 Million Metric Tonne per annum (MMTPA) and the Corporation could only enter into Fuel supply agreements (FSAs) for 17.33 MMTPA of coal (Annexure-I). Further, of the three captive coal blocks<sup>6</sup> under its possession, only one coal block<sup>7</sup> could be developed (March 2011). A coal block viz. Gondulpara was subsequently allocated (January 2006) jointly with Tenughat Vidyut Nigam Limited (TVNL) with the condition that the same would be developed and mined by TVNL, the leader, with equal share of production. However, this coal block had not yet been developed (March 2014).

Management stated (June 2014) that the delay in development of Gondulpara coal blocks was due to delay in obtaining various statutory clearances.

**3.2.1.1** The DPR of RTPS indicated Barjora (North) and Khagra-Joydev as captive coal blocks which were already allotted by MoC for MTPS and DSTPS in March 2005. Subsequently, the Corporation intimated (November 2007) CEA that they would use the coal block of Saharpur-Jamarpani for RTPS. This coal block could not be developed by the Corporation within stipulated period and was de-allocated (June 2011) by MoC. The de-allocation was, however, withdrawn in January 2012. The Corporation awarded (February 2012) the work order for exploration and preparation of Geological Report (GR). As per the status report sent to CEA, coal production would commence from April, 2016 which seemed to be uncertain as the exploration work could not be started (March 2014). This has a cascading effect on commencement of coal production in the coal block. Meanwhile, the Corporation entered (August & September 2013) into FSA with coal companies for 3.89 MMTPA of coal and it would be diminished within 3 years from the normative date of coal production from the captive coal block. Thus, there would be uncertainty in obtaining coal of required quantity after March 2019 if coal production does not commence from the captive coal block. Management stated (June 2014) that the exploration works of the coal block could not be started due to law & order problem.

Ministry stated (February 2015) that the entire scenario of coal linkage for new units had changed as a result of de-allocation of all coal blocks of the Corporation in view of the order

<sup>6</sup> Barjora (North), Khagra-Joydev, Saharpur-Jamarpani.

<sup>7</sup> Barjora (North)

of the Hon'ble Supreme court and endeavour was being made for fresh allocation of coal blocks to ensure availability of coal.

**3.2.1.2** As per DPR, KTPS required 4.69 MMTPA of coal. It was observed that the coal block, originally meant for KTPS, was contemplated for use in RTPS. The Corporation finalized (December 2012) FSA for 4.62 MMTPA after a delay of five years from issue of letter of assurance by Mahanadi Coalfields Limited (MCL). Although Unit # 1 was targeted for commissioning by March 2011, it got delayed due to lack of readiness of railway infrastructure for bringing coal and non-finalization of FSA. In the absence of the above, the commissioning was done (July 2011) by bringing crushed coal of nearby TPSs through road transport. Ultimately, the COD of the unit could be declared in July 2013, after 2 years of commissioning, by diverting coal of other units mainly due to delay in finalization of FSA and readiness of associated infrastructure.

The management accepted (June 2014) the above reasons for the delay. The Ministry, however, contended (February 2015) that MoU with MCL was signed in October 2010 for supply of coal to KTPS. This is not factually correct as MoU was entered in March 2012. Ministry's further contention that the COD of KTPS was not delayed due to delay in signing of FSA is also not acceptable as COD was declared after a delay of more than two years from the target date and that too by diverting coal from other units.

**3.2.1.3** According to the DPR, DSTPS required 3.9 MMTPA of coal. The DPR did not mention the exact source from where the coal was to be linked but it was assumed that the coal source would be at a distance of 100 Kms from the exchange yard of the plant premises. Although the DSTPS Unit # 1 was targeted for commissioning in March 2011, the same got delayed due to lack of readiness of railway infrastructure and non-finalization of FSA/MoU. Hence, the commissioning was done (July 2011) by diverting coal from MTPS. The Corporation, however, entered (November 2011) into MoU with Eastern Coalfields Limited (ECL) but was not getting coal since it did not declare private siding of its own upto June 2012. Ultimately, the COD of the unit could be declared in May 2012 and finally FSA could be signed by the Corporation in July 2013 for Unit # 2, and September 2013 for Unit # 1 for a quantity of 3.73 MMTPA.

Management accepted (June 2014) the above reasons for delay in COD. The Ministry, however, contended (February 2015) that COD of DSTPS was not deferred due to delayed signing of FSA. This contention is not tenable as COD was delayed due to lack of readiness of railway infrastructure as well as non-signing of MoU/FSA.

**3.2.1.4** The Corporation/DPR assessed total coal requirement of MTPS as 11.50 MMTPA (7.65 MMTPA for Unit # 1 to 6 and 3.85 MMTPA for Unit # 7 & 8) against total coal linkage of 8.27 MMTPA<sup>8</sup> and thus, there was a deficiency of coal linkage of 3.23 MMTPA. Audit observed that during the period 2012-13, Unit # 7 & 8 consumed 3.21 MMT of coal but coal linkage for these units was 2.81 MMT [Barjora (North) supplied 1.84 MMT and MoU was for 0.97 MMT]. For sustaining generation of the units, the Corporation requested (December

<sup>8</sup> 5.60 MMTPA from FSA for Unit # 1 to 6 + 1.7 MMTPA from Barjora (North) since March 2011+ 0.97 MMTPA from MoU (valid up to March 2013) with ECL

2011) ECL for supply of coal to MTPS beyond the Annual Contracted Quantity (ACQ) of FSA. As per the modalities of FSA, coal received in excess of 90 *per cent* of ACQ attracts payment of Performance incentive (PI) to the coal companies. Accordingly, ECL claimed ₹ 299.18 crore<sup>9</sup> as PI during the year 2011-12 and 2012-13 for supply of coal in excess of ACQ, out of which the Corporation paid ₹ 104 crore (March 2014). In this connection, it is worth mentioning that the coal sourced by the Corporation from the captive coal block was cheaper<sup>10</sup> than the coal supplied by coal companies. Thus, due to delay in development of the captive coal blocks, the Corporation lost the opportunity to use cheaper coal. Moreover, it had to bear additional cost as PI towards procurement of coal over and above the ACQ.

The contention of the management (June 2014) that no additional expenditure was incurred on receiving coal on PI against FSA for operation of Unit # 7 & 8 is not tenable as the requirement of coal could have been met without procuring the same on PI, had the allotted captive coal blocks been developed as per schedule and/or FSA for adequate quantity been made.

Ministry stated (February 2015) that the entire scenario of coal linkage for new units had changed as a result of de-allocation of all coal blocks of the Corporation in view of the order of the Hon'ble Supreme court and endeavour was being made for fresh allocation of coal blocks to ensure availability of coal.

**Recommendation 1:** *The Corporation may pursue with the concerned Ministry to ensure availability of coal before commissioning of the power projects.*

### 3.2.2 Contract Management

Audit examined in detail the various stages of contract management, *inter-alia*, cost estimate, invitation of bids, receipt and opening of bids, processing and evaluation of bids, pre-award discussion with the recommended bidder, award of contract, and post-award implementation of contract. All the nine units under XI Plan projects were executed by the Corporation through 21 major packages/contracts.

The Corporation had framed guidelines for implementing contracts within a set time frame and at a competitive price. Accordingly, the time frame for various pre-tendering, tendering and post-tendering activities was set out in their manual. As per the manual, a contract should be awarded within 161 days from the date of invitation of tender.

Audit examined 21 contracts since the stage of invitation of tender. It was observed that four contracts were awarded to BHEL, of which two were on nomination basis and the other two on single bid in consultation with CEA. Further, four contracts related to railway infrastructure were awarded to RITES on nomination/single tender basis. Of the remaining 13

<sup>9</sup> ₹ 209.49 crore for 2011-12 and ₹ 89.69 crore for 2012-13

<sup>10</sup> The Corporation sourced the coal supplied by the operating agency of Barjora (North) at a discount of 19.5 *per cent* to 25 *per cent* of the notified price of Coal India Limited.

contracts (including one finalised on single snap bid<sup>11</sup> basis), only six contracts were finalised within the prescribed time frame. The remaining seven contracts were finalised with delays ranging from 12 to 117 days. There were delays of more than 100 days in respect of four contracts (Annexure- II). The main reasons for delay were extension of bid submission dates and discrepancies in scope of work detected during finalisation of price bids.

The cost estimation for each package having various elements is prepared to establish the reasonableness of the cost at which the package could be executed. Therefore, it is essential that the same is worked out in a realistic and objective manner on the basis of prevailing market rates, last purchase price/last work order rate and economic indices for various inputs. In respect of the 13 major contracts executed through tendering process, the work was awarded to the L1 bidders. Audit observed that there were wide variations between the estimated cost and awarded value relating to the nine contracts. The awarded value in respect of four contracts of BTPS 'A' was significantly lower than the estimated cost and ranged between 22.78 *per cent* and 46.26 *per cent*. The awarded values of four<sup>12</sup> contracts were higher than the estimated cost by 18.28 to 45.50 *per cent*. It was further, observed that in two cases the estimates were unrealistic and in the remaining two cases management did not carry out any analysis for ascertainment of such wide variation (Annexure- IV).

Time remains the essence of all major contracts awarded by the Corporation. Management should therefore, ensure availability of all the infrastructure like land, approach road, clear front and sources of water etc. for smooth execution of the project work. As each project was executed through a number of contracts/packages, simultaneous progress of the same in a synchronised and coordinated manner should also be ensured. Active persuasion and interaction with the various contractors and other agencies involved in the projects were required to combat the hindrances arising during execution of work.

Audit observed that there were delays in execution of all the 21 contracts ranging from 15 to 54 months (March 2014) [Annexure – II]. Reasons responsible for delay in execution of contracts were examined in audit. It revealed that such delay of the projects was basically due to the following reasons and are discussed in detail in Para 3.2.3:

- Awarding of contract without ensuring availability of entire stretch of land for greenfield projects (Main plant package, Plant water corridor, Railway infrastructure of RTPS, Ash ponds of both DSTPS & KTPS, and Railway infrastructure of KTPS & DSTPS).
- Non- availability of clear fronts to the contractors in respect of extension projects where the Corporation had entire stretch of land under its possession indicating lack of coordinating action on the part of management (all packages of MTPS and two packages of BTPS).
- Poor mobilisation of manpower and machinery by contractors.

<sup>11</sup> Snap bidding is opted when it is not possible to objectively evaluate the bids received and go for re-tendering. In such bidding system revised/fresh bids are invited only from those bidders who have already participated and submitted a valid bid and qualified for opening of Price bid.

<sup>12</sup> Two contracts of KTPS and one contract each of MTPS Ph-II & DSTPS.

- Delay in supply of materials by contractors.
- Non availability of approach road to the project site.
- Delay in completion of related packages like CHP and PWS.

Audit further observed that though progress review meetings were held between management and the contractors to address various hindrances during execution of work, the same did not give effective results. It is worth mentioning that controllable factors on the part of management like availability of land and work fronts were not properly addressed and sorted out in time.

As per provision of contract, the Corporation reserved the right to recover Liquidated damage (LD) from contractor in case of delay in completion for the reasons attributable to contractor. In case of delay in execution, the decision for time extension and imposition of LD was taken after detailed analysis indicating the reasons and period of the delay attributable to the Corporation as well as the contractor. It was observed that committees were set up to analyze the delay in respect of ten contracts of which reports for six contracts were submitted (August 2014). However, only two reports were approved by the competent authority (Annexure V). In one case (CHP of DSTPS), the delay of 19 months and 27 months for completion of facilities in respect of Unit 1 and 2 respectively was on account of delay in handing over of fronts by the Corporation and an amount of only ₹ 0.7 lakh was imposed as LD on the contractor due to delay in supply of mandatory spares. In the other case (PWS of MTPS), although there was a delay of 32.5 months, LD could not be imposed on the contractor as there was substantial delay on the part of the Corporation towards releasing clear fronts to the contractor. Audit, therefore, observed that there were deficiencies in various stages of contract management and the objective of efficient and timely execution of the contracts remained unfulfilled.

While accepting the audit observations, the Ministry stated (February 2015) that the Corporation would try to follow the guidelines in respect of contract management to minimize the controllable factors like availability of land and work fronts.

### 3.2.3 Project Execution

One of the major objectives of the National Electricity Policy, as envisaged by the GoI, was to meet the demand for electricity by 2012 i.e. within the XI Plan period. Audit observed that out of the five projects involving nine units (4700 MW), the Corporation had commissioned only one unit with a capacity of 500 MW within the XI Plan Period with a delay of 17 months from the scheduled date of commissioning. Of the remaining eight units, four units with a capacity of 2000 MW were commissioned during the period April 2012 to March 2014 with a delay ranging from 21 to 37 months and balance four units with a total capacity of 2200 MW were still under execution and lagging behind the schedule by 34 to 49 months [(March 2014) Annexure-III].

Audit further observed that only one unit (MTPS Unit # 7) of the project was commissioned within the XI Plan period with a delay of 18 months beyond the norms fixed by the CERC.

During the period from April 2012 to March 2014, another four units were commissioned with a delay of 17 to 41 months from the above CERC norms. The anticipated commissioning dates of the remaining four units which were under construction as on March 2014 were behind the CERC norms by 43 to 56 months (Annexure – III). The audit findings in respect of execution of the XI Plan projects are discussed below:

### 3.2.3.1 Meija Thermal Power Station (MTPS 2 x 500 MW Unit # 7 & 8)

Management considered this project to be a fast track project of XI Plan with the availability of land and other infrastructural facilities within the plant premises. The investment approval of the project was accorded in August 2006 with an estimated cost of ₹ 4617 crore and the actual cost incurred was ₹ 5363.45 crore (March 2014).

A) The details of the packages are as follows:

Table 3: Package wise details of MTPS

| Packages               | Name of the Contractor             | Scheduled Completion | Actual Completion | Delay (in months as on March 2014) | ₹ in crore)  |                                    |
|------------------------|------------------------------------|----------------------|-------------------|------------------------------------|--------------|------------------------------------|
|                        |                                    |                      |                   |                                    | Awarded cost | Actual Expenditure upto March 2014 |
| MPP                    | BHEL                               | Unit # 7 March 2010  | August 2011       | 17                                 | 3538         | 3403.11                            |
|                        |                                    | Unit # 8 June 2010   | August 2012       | 26                                 |              |                                    |
| CHP                    | Elecon Engineering Company Limited | September 2009       | Pending           | 54                                 | 378.51       | 306.33                             |
| PWS                    | Larsen & Toubro Limited (L&T)      | September 2009       | May 2012          | 32.5                               | 93.23        | 89.73                              |
| Railway Infrastructure | RITES                              | June 2015            | Pending           | -                                  | 158.55       | 16.36                              |

It was observed that the major reasons for delay of MPP were delayed availability of clear work fronts (Unit # 7 for seven months and Unit # 8 for 17 months), coal linkage, non availability of water and delay in completion of CHP. The CHP was made operational before the COD of the units with the exception of stacker and reclaimer, elevator, electric hoist etc. As per the original schedule of the main plant package, Demineralised (DM) water was to be made available to BHEL by January 2009. Audit observed that as per the work order, DM water production was to be commissioned within 16 months i.e. by May 2009. However, the DM plant was finally brought in to operation in January 2010 i.e. after a delay of seven months mainly due to non availability of work fronts.

While accepting the above delays, the management stated (June 2014) that the delay in COD of Unit # 7 due to delayed commissioning of CHP was not fully correct as the unit was operated on full load in August 2010 by coal feeding through the crusher house of the existing units to the bunker of Unit # 7. It was further stated that the work fronts were not made available to M/s L&T due to stacking of materials and machineries of BHEL and other agencies on the PWS area. The contention of the management is not tenable as the operation of Unit # 7 by coal feeding through contingency route was only for trial run of the unit but



COD was achieved in August 2011 i.e. after one year of full load run when the CHP was made operational. Further, delay in commissioning of PWS could have been avoided by proper planning and earmarking of area for stacking of materials etc. as the required land was already under the possession of the management.

As per the guidelines of the Railways, it is compulsory to construct the Wagon Tippler (WT) along with the Track Hopper (TH) facility in the Thermal Power Plants for unloading of coal brought by the Railways. Incidentally, it may be mentioned that availability of BOXN wagons, which are unloaded through WT, are readily available than BOBR wagons, which are unloaded through TH. All the new projects (500/600 MW) of the Corporation have been provided with WT and TH. Therefore, WT is very much required for sustained power generation of Unit # 7 & 8 as it would improve the availability of coal through BOXN type wagons. It was noted that at the time of giving approval (August 2008) for the DPR of the 3<sup>rd</sup> TH and additional railway infrastructure in the MTPS Phase-II, the Railway authority directed the Corporation to construct both WT and TH to cater to the need of coal supply for its new 2 X 500 MW units. It was, however, observed that even after a lapse of more than 7 years from the approval of the DPR, the Corporation is yet to construct a WT.

Further, the FR for doubling the railway line between Mejia TPS and Raniganj was submitted by RITES in August 2010 which was subsequently revised in September 2011 to incorporate the requirement of Eastern Railway, for construction of a bypass line to connect Baktarnagar Block Halt with Mejia Captive line avoiding Raniganj station. The Corporation placed (December 2012) the order on RITES for construction of such railway infrastructure. There was no appreciable progress in the work (March 2014).

Management stated (June 2014) that due to land constraint, WT could not be provided and they were exploring possible/suitable location for providing the same. Reply of the management indicated deficiencies in planning which could not be resolved even after a lapse of seven years. Management further stated (June 2014) that engineering scale plan drawing indicating rail alignment for Baktarnagar bypass line was yet to be approved by Railways and for this land acquisition proposal could not be finalized. Further, acquisition of 5 acres of land for Raniganj-MTPS doubling works was also under process.

Ministry stated (February 2015) that order for feasibility study and preparation of DPR was placed on RITES in December 2014.

### **B) Capacity constraint of ash ponds**

The ash ponds in MTPS with an area of 600 acres and holding capacity of 220 lakh m<sup>3</sup> were constructed to meet the requirement of Units # 1, 2 & 3 (3 X 210 MW). Subsequently, Unit # 4 (210 MW) came into operation in February 2005. Further, the Corporation added two more Units # 5 & 6. There was a provision in DPRs of these units that over and above the collection of ash in dry form, the fly ash along with bottom ash would be disposed of in the existing ash pond. It was observed that there was no ash evacuation from the said ash pond till 2008 as a result of which capacity of the ash pond was being stretched. At the time of commencement of ash evacuation, the ash ponds were filled with 175.08 lakh m<sup>3</sup> of ash against the capacity of 220 lakh m<sup>3</sup>. Further, the rate of ash evacuation was not commensurate with that of ash accumulation and therefore, deposition of ash in the pond was getting increased. It was envisaged in the DPR of Unit # 7 & 8 (1000 MW) that besides collection of ash in dry form, the fly ash along with bottom ash would be disposed of in the

ash pond. However, the DPR did not assess whether the existing ash pond was capable of holding the entire ash that would be generated from all the eight units (2340 MW) in case of low off-take of dry fly ash.

After commissioning of the new units, the ash generated was dumped in the existing ash ponds. This led to spillage of ash slurry in the nearby paddy fields and dams of West Bengal. Audit observed that precarious condition of ash pond arose due to much delayed action for ash evacuation. Further, capacity addition of Unit # 4 to 8 (1710 MW) without augmenting the capacity of ash pond and non evacuation of entire fly ash in dry form affected the running of all the units at their rated capacity. The management also apprehended (June 2012) that excessive loading of the existing ash pond by disposing ash from all the Units # 1 to 8 might cause disaster at any time. The Corporation took up the matter with CEA only in September 2012 for according approval for acquisition of additional land for construction of additional ash ponds. The same was approved by CEA in April 2013 and finally the Corporation applied (June 2013) to accord permission for acquisition of additional land.

Management stated (June 2014) that during preparation of DPRs of Units # 4 to 8 of MTPS, concept of dry fly ash collection provision (80 per cent of the total ash generated) had been incorporated. It was further contended that there was no deficiency in planning stage of Unit #7 & 8 as the original concept was to go for installation of 100 per cent dry fly ash evacuation system with zero discharge in ash pond. Management further stated that contemplating for better ash management to take additional care in respect of problems encountered for pond ash evacuation, initiative was taken in September 2012 for acquisition of land.

Ministry stated (February 2015) that persuasion was being made with the concerned authorities for construction of additional ash pond.

### 3.2.3.2 Durgapur Steel Thermal Power Station (DSTPS 2 x 500 MW)

DSTPS was an XI Plan greenfield project of the Corporation. The investment approval of the project was accorded in April 2007 with an estimated cost of ₹ 4457 crore. The actual expenditure incurred was ₹ 5861.51 crore (March 2014).

Table 4: Package wise details of DSTPS

|                        |                        |   |                   |                                     |   |   | (₹ in crore) |
|------------------------|------------------------|---|-------------------|-------------------------------------|---|---|--------------|
| Packages               | Name of the Contractor | Scheduled Completion                        | Actual Completion | Delay in months (as on 31.03. 2014) | Awarded cost excluding taxes & Price variation etc. | Actual Expenditure upto March 2014 including taxes & Price variation etc. |              |
| MPP                    | Unit # 1               | BHEL  | August 2010       | May 2012                            | 21  | 3228.84   | 3426.16      |
|                        | Unit # 2               |   | November 2010     | March 2013                          | 28  |   |              |
| PWS                    | M/s VA TECH WABAG      | December 2009                               | November 2011     | 23                                  | 134.49  | 147.82  |              |
| CHP                    | Unit # 1               | M/s ThyssenKrupp Industries India Pvt. Ltd. | June 2010         | January 2012                        | 19  | 430   | 462.81       |
|                        | Unit # 2               |   | September 2010    | December 2012                       | 27  |   |              |
| Railway Infrastructure | RITES                  | January 2011                                | June 2012         | 17                                  | 142.79*   | 127.77  |              |

\*Inclusive of taxes etc.

The main reasons for delay of MPP were non-availability of material at site, absence of approach road leading to problem in transporting the material at site, slow progress in structural work for mill bunker and tippler floor casting of Unit # 1, poor mobilization of manpower by BHEL and non-availability of crane for construction of Unit # 2, absence of in-charge for Turbine erection.

The MPP included construction of ash ponds having two lagoons of different capacities for evacuation of ash from the power station. It was observed that lagoon 2 of higher capacity could not be constructed due to non-availability of land from Durgapur Steel Plant (SAIL) and the ash generated from both the units was being dumped in the existing lagoon 1 which had become almost filled up. Thus, sustained generation from both the units would not be possible unless the second ash pond is constructed.



*Picture 2: Filled up Lower capacity lagoon of Ash Pond – DSTPS*

While accepting the delay in commissioning of the units, the management stated (June 2014) that two third of lagoon 1 was filled with wet ash and there would be no difficulty of wet ash evacuation in near future. This contention of the management is not tenable as two third of the lagoon 1 was filled with wet ash within a period of one and half year of commissioning of both the units and lagoon 1 would not be able to accommodate the entire wet ash generated from both the units.

It could be seen that one of the major facilities of the PWS (DM Plant), scheduled to be completed by August 2009, was actually completed in November 2011 with a delay of 27 months. The main reasons for delay were mismatch in alignment of the water pipeline corridor, delay in finalization of civil drawing and delay in mobilization of mechanical erection contractor at site. Management in its reply also attributed the change in positioning of the railway crossing as one of the major reasons for the delay.

Audit observed that the main reasons for delay of CHP were delay in handing over of different front areas, unavailability of service water to enable operation of integrated system

and testing of utilities, delay in creation of approach road, delay in structural erection and delay in various civil works and occupancy of work fronts by material of other agencies etc.

Management accepted the audit observation (June 2014).

The completion of railway infrastructure (TH and WT) was delayed by 17 and 23 months respectively which contributed to the delay in COD of the units. The reasons for delay were delay in finalization of level crossing within the plant boundary for the passage of railway track, earth work, release of work front and work of Road under Bridge (RuB) etc. Management stated (June 2014) that there was also a delay in obtaining permission from SAIL for merry-go-round system.

Ministry stated (February 2015) that the capacity of ash pond/lagoon 1 was as per the present power generation of the units which was about 40 *per cent* of the total capacity. This is not acceptable as the capacity of ash pond should have been commensurate with total generating capacity of units.

### 3.2.3.3 Koderma Thermal Power Station (KTPS 2 x 500 MW)

KTPS was an XI Plan greenfield project of the Corporation. The investment approval of the project was obtained in August 2006 with an estimated capital cost of ₹ 4212 crore. The actual expenditure incurred was ₹ 6676.32 crore (March 2014).

Table 5: Package wise details of KTPS

| Packages               |          | Name of the Contractor           | Scheduled Completion | Actual Completion | Delay in months (as on 31 March 2014) | Awarded cost excluding taxes & Price variation etc. | Actual Expenditure upto March 2014 including taxes & Price Variation etc.) |
|------------------------|----------|----------------------------------|----------------------|-------------------|---------------------------------------|---|--|
| MPP                    | Unit # 1 | BHEL                             | June 2010            | July 2013         | 37                                    | 3280.52   | 3412.53  |
|                        | Unit # 2 |                                  | September 2010       | Pending           | 42                                    |   |  |
| CHP                    | Unit # 1 | Larsen & Toubro Ltd. (L&T)       | June 2010            | April 2013        | 34                                    | 329.88  | 357.93   |
|                        | Unit # 2 |                                  | September 2010       | June 2013         | 33                                    |   |  |
| PWS                    |          | M/s Kirloskar Brothers Ltd (KBL) | February 2010        | Pending           | 49                                    | 166.77  | 170.39   |
| Railway Infrastructure |          | RITES                            | April 2011           | Pending           | 35                                    | 188.05  | 175.74   |

The ash pond under the MPP was scheduled to be completed in April 2010. The Corporation, however, could not get the possession of the vast chunk of land required for the construction of the ash pond due to law and order problem. Further, diversion of Gramin Sadak Yojana Road of Rural Works Department, Government of Jharkhand (GoJ), passing through ash pond area of the Corporation was pending. As the permanent ash pond could not be constructed, the Corporation had to construct a temporary ash pond by incurring an extra expenditure of ₹ 36.50 crore in order to meet the exigency of COD. This apart, while late start of civil works, local disturbance, poor execution by sub vendors, delay in supply of

materials and equipments, delayed execution of plant water system and labour problems, etc. were major reasons for delayed COD of Unit # 1, problems in ash evacuation, failure of tube leakage and fire in TG floor etc. attributed to delay in COD of Unit # 2.



Picture 3: Road under Gramin Sadak Yojana of Rural Works Department, GoJ passing through ash pond area of KTPS

While accepting the problems encountered in acquisition of land, Management stated (June 2014) that the matter relating to the road will be taken up with the GoJ in due course. It was also stated that the Rehabilitation and Resettlement (R&R) policy was under finalization for resolving the land issue.

The main reasons for the delay in completion of CHP were non-handing over of different working fronts as per the contractual schedule, change in the basic plot plan and delay in drawing approval, Quality Assurance Provisions approval, vendor approval and also delay in providing proper access road. Management stated that delay in readiness of the railway track was also one of the reasons for delay in completion of CHP.

The construction of PWS was delayed for which the CODs of the units were also delayed. The main reasons for delay were poor mobilisation of man and machinery from the very beginning, delay in finalization of drawings, finalization of sub vendors for DM plant, delayed supply of materials due to strike by labourers on various occasions and lack of clarity in the scope of the work etc.

The contention of Management/Ministry (June 2014/February 2015) that the commissioning of main plant was not delayed due to non-completion of PWS is not tenable as it was clearly mentioned in the exception/status report placed to the board of the Corporation that one of the reasons for delay of the project was poor execution of the PWS.

Under the railway infrastructure package, the coal rakes started moving in KTPS from September 2012 onwards i.e. after a delay of 16 months from its schedule. However, Junction arrangement and Signaling & Telecommunication (S&T) at Hirodih station and civil, S&T and Overhead electrification works at Larabad section were still pending (March 2014) due to non-availability of some parts of land. This restricted the smooth movement of coal rakes. Management stated (June 2014) that they were pursuing with the railway authorities for

resolving the issues relating to junction arrangement but did not mention the ways to sort out the land acquisition problem.

**Recommendation 2: The Corporation may vigorously pursue with the concerned department of Government of Jharkhand to resolve the problem of acquisition of full stretch of land for ash pond of KTPS.**

### 3.2.3.4 Bokaro Thermal Power Station (BTPS 'A' 1 x 500 MW)

Management considered this project to be a fast track project of the XI Plan with the availability of land and other infrastructural facilities within the plant premises. It was also decided (June 2006) to set up this new power station at Bokaro after dismantling the existing BTPS - A units, which were closed down earlier. The original approved project cost was ₹ 2260 crore. The actual expenditure incurred was ₹ 2481 crore (March 2014).

Table 6: Package wise details of BTPS 'A'

(₹ in crore)

| Packages                   | Name of the Contractor          | Scheduled Completion | Actual Completion | Delay in months (as on March 2014) | Awarded cost excluding taxes & Price variation etc. | Actual Expenditure upto March 2014 including taxes & Price variation etc.) |
|----------------------------|---------------------------------|----------------------|-------------------|------------------------------------|---|--|
| MPP                        | BHEL                            | December 2011        | Pending           | 27                                 | 1840  | 1896.28  |
| CHP Main                   | Techpro Systems Ltd             | January 2015         | Pending           | -                                  | 146.56  | 2.69   |
| CHP Stacker Reclaimer (SR) | TRF Ltd                         | January 2015         | Pending           | -                                  | 31.65   | 0  |
| PWS - (DM) Plant           | VA Tech Wabag                   | June 2014            | Pending           | -                                  | 21.36   | 4.13   |
| PWS- (PT) Plant            | McNally Bharat Engineering Ltd. | August 2014          | Pending           | -                                  | 48.78   | 8.47   |

A MoU was entered into (May 2006) with BHEL for construction of the power plant. However, there was delay in dismantling of the closed units as the contractor to whom work was awarded did not carry out the work. The Corporation subsequently decided (June 2007) to execute the project through International Competitive Bidding (ICB). But NIT, issued in June 2007, did not receive any bid within the scheduled time and was subsequently cancelled. Fresh NIT was issued in October 2007 which received only one bid from Reliance Energy Limited (REL). The offered price of REL was ₹ 3134 crore which was considered higher by the management. REL did not agree to reduce the offered price during negotiation. The Corporation cancelled (May 2008) the tender submitted by REL and decided for negotiation with BHEL on nomination basis. Accordingly, order was placed (June 2008) on BHEL for the main EPC package at a cost of ₹ 1840 crore (excluding taxes etc.) with Price Variation Clause (PVC). The remaining packages viz. CHP, PWS and Switch Yard etc. were awarded separately to other contractors. The scheduled completion of the MPP was 39 months from

zero date (September 2008) i.e. by December 2011. It was decided by the Corporation that the existing switchyard of BTPS-A old plant was to be dismantled and removed within 11 months i.e. by May 2009 for making the space available for constructing Electrostatic Precipitator (ESP) and chimney by BHEL, which were parts of MPP.

Audit observed that clear fronts could be handed over to BHEL for construction of ESP and chimney only in December 2011 (which was the scheduled completion of MPP) after a delay of more than 30 months. The anticipated commissioning of the unit has been fixed in October 2014. The contention of the management that delays in dismantling of the closed units due to its heritage value is not acceptable as it indicates the lack of awareness while planning the project.

The work for construction of CHP was divided into two parts i.e. CHP Main and SR with a completion schedule of 25 months for each package. It was observed that the Corporation did not provide clear fronts to TRF for construction of SR as the space envisaged for storing of coal was not available due to non-stoppage of operation of the temporary ash ponds.

In the meantime, the Ministry of Environment and Forests (MoEF) granted (March 2007) environmental clearance for BTPS-A subject to the condition that the permanent ash pond should be provided with impervious lining. The work for construction of the new ash ponds was awarded (November 2008) to Hindustan Steelworks Construction Limited (HSCL) at a cost of ₹ 48.50 crore with scheduled date of completion of 18 months i.e. by March 2010. However, the above order did not include the work of providing impervious lining in the ash pond as stipulated by MoEF. The work for the construction of ash pond was completed and trial run of ash slurry disposal was done in May 2013 after a delay of 37 months. However, Jharkhand State Pollution Control Board (JSPCB) directed to provide impervious lining in bed and upstream slope of all the ponds of newly constructed ash pond before discharging of ash slurry into the pond. Thus, the new ash ponds could not be made operational unless the impervious lining was provided.

Meanwhile, TRF left the site after serving the notice of termination (September 2013) due to non-availability of site for storage of coal wherein the SR was to be constructed. Audit, therefore, observed that till the completion of the work for impervious lining, the new ash pond would not be made operational and the space for temporary ash ponds would not be available for storage of coal/construction of SR for CHP, which would consequently hamper the commissioning of the main plant. The work for impervious lining was awarded in December 2013 and the same was completed in May 2014. Management stated (June 2014) that the fresh tendering of the SR Package was under process. It was further stated that the clearance from JSPCB for charging of ash pond was awaited.

As per the original schedule, the water was to be made available to BHEL for hydro test by October 2010. Audit, however, observed that the NIT for construction of PT Plant and DM Plant relating to PWS was issued in March 2012 i.e. after a delay of seventeen months from the scheduled date of making available water to BHEL. The orders for PT and DM Plants were actually awarded in December 2012. Based on the availability of water, BHEL

subsequently revised its schedule for main plant and accordingly the revised date of hydro test was February 2014 so that the project could be commissioned in October 2014. The work for both the plants was pending (March 2014). Audit, however, observed that the revised commissioning schedule (October 2014) would not be adhered to as the construction work of the PT and DM Plants has commenced only in quarter ending September 2013.

Management stated (June 2014) that measures were being taken for the availability of DM water & Clarified water as per the requirement of the plant by completing the basic system.

Ministry stated (February 2015) that action had been taken to award the balance package of CHP including SR to BHEL.

**Recommendation 3: The Corporation may take immediate action for installation of SR of CHP of BTPS-A to avoid any further delay.**

### 3.2.3.5 Raghunathpur Thermal Power Station (RTPS 2 x 600 MW)

RTPS was an XI Plan greenfield project of the Corporation. The DPR was prepared in February 2007. The original project cost was ₹ 4122 crore. The actual expenditure incurred was ₹ 6597.29 crore (March 2014).

Table 7: Package wise details of RTPS

| Packages               |          | Name of the Contractor  | Scheduled Completion | Actual Completion | Delay in months (as on March 2014) | Awarded cost inclusive of taxes etc. on Price variation basis. | Actual Expenditure upto March 2014 including taxes, duties & Price variation etc.) |
|------------------------|----------|-------------------------|----------------------|-------------------|------------------------------------|--|--|
| MPP                    | Unit # 1 | REL                     | November 2010        | Pending           | 40                                 | 3725   | 3728.66  |
|                        | Unit # 2 |                         | February 2011        | Pending           | 37                                 |  |  |
| CHP                    | Unit # 1 | TRF Limited             | October 2010         | Pending           | 41                                 | 413.85   | 381.45   |
|                        | Unit # 2 |                         | January 2011         | Pending           | 38                                 |  |  |
| PWS                    |          | Mackintosh Burn Limited | May 2010             | Pending           | 46                                 | 196  | 141.40   |
| Railway Infrastructure |          | RITES                   | December 2012        | Pending           | 15                                 | 496.69   | 100.26   |

It was observed that the Corporation issued NIT of MPP (May 2007) without having land in its possession and awarded the work in December 2007. However, both the units could not be commissioned (March 2014). The main reasons for the delay were non-handing over of clear site on time, non-availability of materials at site, non-deployment of adequate man power, slow progress in erection work, improper erection causing rectification/modification thereof, non-availability of insulation materials, delay in construction of ash handling system (both dry and wet) etc. As per contract, the Corporation was to hand over the land earmarked for main plant by January 2008 and the balance plant land by March 2008. Audit observed that out of the requirement of main plant land of 928.63 acres, the possession of the first 379.12



acres was taken over by the Corporation in February 2008 and given to the contractor for starting the civil activities. Finally, the last stretch of main plant land was handed over in March 2009 i.e. after a delay of one year. The possession of land for ash dyke and its approach road was handed over in June 2012 and October 2012 i.e. after a delay of more than 4 years. The land for boundary was handed over progressively which delayed construction of the boundary wall and resulted in safety as well as security problems during execution of the project work. Further, the Corporation could not ensure availability of medium and cooling water required for majority of the equipments due to absence of clear land for intake water corridor. There was also delay in arranging coal and resolving interface issues relating to CHP. While agreeing to the audit observations, Management stated (June 2014) that after closing of contract a detailed analysis would be carried out to ascertain the reasons for delay.

The work of construction of two Natural Draft Cooling Towers (NDCTs) - I & II was a part of the EPC contract for MPP awarded to REL. The NDCTs were meant for the two units of RTPS. The supervision and monitoring of the above construction work was done by Tata Consulting Engineers Limited (TCE). The Corporation also carried out the supervision work of NDCT-1 on its own. However, the Corporation carried out supervision work of the construction upto 24<sup>th</sup> lift and TCE stated to have carried out such supervision work upto 28<sup>th</sup> lift only through cage ladder. The passenger lift was made available only after the construction of 35<sup>th</sup> lift and thus, construction work from 29<sup>th</sup> to 35<sup>th</sup> lift remained unsupervised. Subsequently it was found that the construction was defective due to discrepancy in reinforcement of steel from 32<sup>nd</sup> to 35<sup>th</sup> lift. The construction of deficient part from 35<sup>th</sup> lift upto top of 28<sup>th</sup> lift was dismantled by February 2014. The reconstruction work above 28<sup>th</sup> lift started in April 2014. Thus, COD of one of the units of RTPS would be hampered till the completion of construction of NDCT-I.



Picture 4: Incomplete NDCT-I and Complete NDCT-II at RTPS

Audit observed that despite being aware of the fact that supervision of construction work at NDCT-I beyond 28<sup>th</sup> lift was not possible for want of passenger lift, the management did not take any step to stop the construction work till the installation of the passenger lift.

Management stated (June 2014) that committees were set up to identify the responsibility for providing lesser quantity of reinforcement in NDCT-I and recommend action to be taken in this regard. It was also stated that M/s TCE had been debarred from participation in tender for consultancy work of RTPS Phase-II.

Audit observed that the completion of CHP was rescheduled to June 2014 as against the original schedule of January 2011 mainly due to non-availability of clear fronts and inadequate safety and security measures at the site. Management accepted the audit observation (June 2014).

It was further observed that the work of PWS could not be completed due to non acquisition of full stretch of land and submerging of intake well (April 2012) on the Panchet reservoir due to cyclone. It was also observed that frequent changes in the design and drawings of the approach bridge of intake well by the Corporation also led to delay in execution of the above work. Due to non-availability of DM water, the hydro testing of Unit # 1 & 2 of RTPS was done in September 2011 and May 2012 respectively by bringing water from MTPS at a cost of ₹ 0.14 Crore. The completion period of PWS has been rescheduled to June 2014.

Management stated (June 2014) that the delay was mainly due to non-acquisition of land, which was beyond the control of the Corporation. The contention of the management is not acceptable as the issues relating to acquisition of land is obvious while implementing the greenfield project like RTPS, and the same should have been taken up at appropriate level with the Government of West Bengal, one of its stakeholders.

As per DPR of RTPS, coal for the project was to be received from mines like Barjora North, Khagra-Joydev and other blocks of ECL and seven to eight rake loads of coal were needed to be transported daily in BOBR wagons. The proposed railway corridor is located 14 Kms away from the plant with connectivity from the two stations i.e. Joychandipahar (JOC) and Bero on either side on Adra-Asansol section of the Railways. It was also envisaged in the DPR that the economics of the railway routes was to be looked into by a competent agency like RITES/IRCON. The Corporation approached (June 2007) M/s RITES Ltd for preparation of DPR for construction of the above proposed rail route from the existing Sanka station of South Eastern Railway. RITES submitted (March 2008) its report with the proposal that the most feasible and economical route was the rail alignment passing through the land owned by West Bengal Industrial Development Corporation which was earmarked for M/s Jay Balaji Industries Limited (JBIL). This proposal also envisaged traffic sharing with JBIL through the proposed railway route. Based on the above proposal, the Corporation issued (June 2010) the LOA to RITES for the work relating to detailed engineering and construction management services for construction of railway system with the completion schedule by December 2012. It was, however, observed that the work was yet to be completed (March 2014). Out of the total land requirement of 396.913 acres, the Corporation could acquire (March 2014) only 206.984 acres and the balance 189.929 acres of land was yet to be acquired from the

Government of West Bengal. Thus, the construction of railway route would not be completed unless the balance land was acquired by the Corporation.

While accepting the audit observation, management/Ministry stated (June 2014/February 2015) that they were pursuing with the state and district authorities for acquisition of the balance land.

***Recommendation 4: The Corporation may take up with the Government of West Bengal for acquisition of required land for railway infrastructure of RTPS.***

***Recommendation 5: The Corporation may vigorously pursue with the concerned department of Government of West Bengal for acquisition of full stretch of land for early completion of plant water system of RTPS.***

***Recommendation 6: The Corporation may pursue with the EPC contractor of RTPS for early completion of the construction of NDCT-1 to avoid any further delay in commissioning of the linked unit.***

### 3.3 Monitoring Mechanism

The performance of the projects was monitored by the Board of the Corporation by reviewing the exception reports for the capacity addition programme placed before it by the project department. The exception reports contained the project-wise approved schedule and actual achievement including reasons for delay of various activities. These reports were placed before the Board for information. However, such exception reports neither indicated the methodology for arresting the delays nor fixed any accountability for slippages. The Corporation was having a separate Project Planning and Monitoring (PPM) cell whose main task was *inter alia* to prepare the budget, draft status report as required by MoP, preparation of draft action taken reports and presentation for various management committee meetings and assist in preparation of the above exception reports. Audit observed that PPM cell did not carry out any monitoring activities indicating the means for arresting the delay in execution of the projects. Periodical review meetings were held with the EPC/major contractors at the Corporation as well as the plant level. At the execution level, the Chief Engineer responsible for construction of new project was also additionally monitoring the progress of the work. In case of extension projects, the existing Chief Engineer of the power stations was responsible for monitoring the progress of the project work in addition to his core function of generation of power. Thus, there was no independent authority to monitor the progress of the execution of the work at the construction level, rather monitoring was done by the authority responsible for execution of the work. Thus, the bottlenecks in execution of the projects were not addressed in time.

Timely execution of the green field projects like RTPS and KTPS were hampered due to land acquisition problem where the role of the Government of West Bengal and Government of Jharkhand, the stakeholders of the Corporation, was crucial. It was, however, observed that in the meetings of the board of the Corporation the representatives of the above governments were not apprised of such issues for expeditious settlement.

Audit observed that though review meetings were held regularly, these did not have the desired result in that the works could not be completed as scheduled. Even controllable factors like delay in finalization of drawings, delay in resolving interface issues with the contractors, delay in giving clear and marked fronts, delay in bringing the materials at site etc. were not properly addressed and sorted out in time. It was also observed that there was no defined and proper evaluation of the performance of contractors etc.

The Corporation decided (April 2012 i.e. after the end of the XI Plan Period), to form a Committee on Management Control (CMC) with the task of analyzing delays of new projects. The CMC conducted only three meetings during the period from April 2012 to November 2013.

It was, however, observed that the issues identified in the first meeting remained unresolved even in the third meeting (November 2013), thus, highlighting the necessity of strengthening the monitoring mechanism. Further, CMC recommended (August 2012) to form a dedicated project monitoring cell and adoption of modern tools and techniques with a view to strengthening the project monitoring aspect and closely monitor the projects. In this regard, it was observed that though the Corporation created (April 2013) a dedicated project monitoring cell called the Corporate Monitoring Group (CMG), the same was yet to be made functional (March 2014).

The IT based monitoring is a system which enables the management to receive all information about the project to be monitored and programme in real time thereby helping to highlight the critical issues, the cost overruns and other aspects related to be reported at the various levels of management. The system can also alert the authority for appropriate action if the project is not progressing as per schedule, cost overruns etc. CEA also requested (January 2012) the power utilities to utilise the IT based monitoring to track the daily progress of ongoing power projects. It would also expedite the process of getting clearances from various agencies and be helpful in placing orders of equipments on time. It was observed that the Corporation installed (June 2006) Primavera Project Management Software for IT based monitoring of the projects under execution at a cost of ₹ 11.58 crore. However, the system remained unutilized and therefore the Corporation deprived itself of the benefits of the above system. This fact was also pointed out in the Performance Audit Report of the Capacity Addition Programme during the X Plan (Annual Report of the Corporation for 2007-08).

Management in its reply (June 2014) did not offer any comment on the deficient monitoring mechanism for execution of the XI Plan projects as pointed out by audit. It was, however, stated that the Corporation was going to install a project management mechanism for its XII Plan projects wherein a system would be incorporated to cover the project monitoring.

While accepting the audit observations, Ministry stated (February 2015) that the Corporation had taken action for strengthening the project monitoring system including IT based monitoring system.

### 3.4 Impact Analysis

The Corporation set the target of capacity addition of nine units having capacity of 4700 MW (through its own projects) during XI Plan period (2007-2012). However, only one unit of 500 MW could be added during XI Plan period with a delay of 17 months from the scheduled date of commissioning, which is only 10.6 *per cent* of the target. During the period from April 2012 to March 2014, the Corporation further added four units having capacity of 2000 MW (42.55 *per cent*) with delays ranging from 21 to 37 months from the target date of completion. Power projects with four units having capacity of 2200 MW were under progress (March 2014). These projects were lagging behind their scheduled commissioning date ranging from 34 months to 49 months. The original approved cost of the above nine units was ₹ 19668 crore while the actual cost of the same was ₹ 26979 crore (March 2014) involving cost overrun of ₹ 7311 crore (Annexure-VI).

#### 3.4.1 Cost overrun

The approved cost of the five units already commissioned and one unit (KTPS Unit # 2) in advanced stage of commissioning as on March 2014 was ₹ 13286 crore (excluding margin money). Actual cost incurred against those six units was ₹ 17901 crore upto March 2014 with a cost overrun of ₹ 4615 crore (35 *per cent* of the original approved cost). Analysis of cost overrun revealed that interest during construction (IDC) was increased by ₹ 2366 crore, overhead cost increased by ₹ 450 crore, increase in cost of non-EPC work was ₹ 811 crore, actual cost of EPC contract increased by ₹ 778 crore, increase in cost of land & site development by ₹ 199 crore, while there was decrease of ₹ 11 crore towards other cost. Audit observed that ₹ 1904 crore (41 *per cent*) of the above cost overrun (IDC of ₹ 1771 crore and overhead of ₹ 133 crore) was due to delay in execution of projects. It was further observed that ₹ 500 crore of cost overrun was attributed to wrong estimation of cost of land (₹ 183 crore) and overhead cost (₹ 317 crore) at the time of preparation of cost of projects. It is worth mentioning that the Corporation did not consider the land cost and overhead cost of greenfield projects like KTPS while arriving at the estimated project cost which were ₹ 133 crore and ₹ 317 crore respectively thereby indicating unrealistic assessment. (Annexure VI contd.)

The approved cost of three units under construction was ₹ 6382 crore. The actual cost incurred upto March 2014 was ₹ 9078 crore involving cost overrun of ₹ 2696 crore (42 *per cent* of the original approved cost). The major elements of such cost overrun were IDC of ₹ 1287 crore, land & site development of ₹ 72 crore, cost of EPC contract of ₹ 1262 crore and non-EPC work of ₹ 179 crore. There was a decrease in overhead cost by ₹ 113 crore from the original approved cost. IDC was increased mainly due to delay in execution of the project. The cost of land of Greenfield project (RTPS) was not assessed realistically as the actual cost incurred upto March 2014 was ₹ 112 crore against the original approved cost of ₹ 40 crore (Annexure VI contd.). Further, the cost of essential infrastructure like railway corridor and township etc. of BTPS A and RTPS was estimated on a lower side as against the original approved cost of ₹ 370 crore, the actual cost incurred was ₹ 549 crore and the work was still in progress (March 2014).

Audit, therefore, observed that the project cost increased by ₹ 3078 crore towards IDC (₹ 3058 crore) and overhead (₹ 20 crore) mainly on account of delay in execution of the projects. KTPS and RTPS were the greenfield projects where acquisition of land was one of the primary activities. It was, however, observed that the Corporation did not consider the cost of land of such projects realistically as the original approved project cost of KTPS did not contain the land cost, whereas the land cost of RTPS was assessed abnormally on lower side. Further, the project cost of essential infrastructure like railway corridor and township was also not considered realistically.

Management in its reply (June 2014) indicated the cost over-run by comparing the actual/provisional cost with the revised project cost instead of original approved cost. This is not tenable as the project cost was revised from time to time due to delay in execution and unrealistic assessment of various components of cost. The management, however, did not offer any comment on unrealistic assessment of various components of project cost as pointed out by audit.

Ministry in its reply (February 2015) accepted that the increase in project cost was due to delay in execution.

### 3.4.2 Surplus power

The Corporation while planning for capacity addition of XI Plan (4700 MW) and X Plan spill over projects (1000 MW) decided to allocate power to Delhi Transco Limited (DTL) – 2500 MW, Jharkhand State Electricity Board (JSEB) - 800 MW and other SEBs/ DISCOMs-2150 MW with surplus power of 250 MW. Accordingly, long term Power Purchase Agreements (PPA) was entered into (March 2006 to May 2007) with DTL and other SEBs / DISCOMs. PPA with DTL specified sale of round the clock power of 2500 MW in phases from December 2006 onwards which was to be supplied by the Corporation from its upcoming new generating units namely, MTPS Unit # 6, 7 & 8, CTPS Unit # 7 & 8, DSTPS Unit # 1 & 2 and KTPS Unit # 1 & 2. As per order (March 2007) of Delhi Electricity Regulatory Commission (DERC), Power purchased by DTL has been allocated to the three Distribution companies (DISCOMs) in the National Capital territory of Delhi, namely, BSES Rajdhani Power Ltd (BRPL), BSES Yamuna power Ltd (BYPL) and North Delhi Power Ltd (NDPL). However, due to delay in commissioning of the projects, the Corporation could not supply power as scheduled in the PPA. Subsequently, considering the heavy local demand in the valley area, the Corporation requested the above three DISCOMs through MoP to surrender the power allocated to them. Consequently, the three DISCOMs surrendered power to the tune of 1980 MW which was confirmed by DERC in May 2012 and November 2012. The Corporation commissioned new generating units with a capacity of 3500 MW during the period from April 2007 to March 2014. The Corporation could, however, allocate 2525 MW only (DTL-520, other SEBs/DISCOMs-1400 MW, Corporation's own load 605 MW) with surplus power of 975 MW. It was observed that this 975 MW surplus power was 39 per cent of the capacity (2500 MW) of five new units commissioned under XI Plan project. It was further observed that there was proposed allocation of only 1475 MW (other

SEBs/DISCOMs-750 MW and Corporation's own load 725 MW) of power in respect of the power generating units (2200 MW) yet to be commissioned (March 2014) with a surplus power of 725 MW which is 33 *per cent* of the capacity of such upcoming units (Annexure-VII). As a result of this, the Corporation was not in a position to recover fixed cost ranging from ₹ 1.82 to ₹ 2.40 per unit<sup>13</sup> (kilowatt hour) of power in respect of the generating units already commissioned under XI Plan. Moreover, 39 *per cent* (₹5680 crore) of the total investment (₹14563 crore<sup>14</sup>) made for capacity addition of 2500MW generating units remained unutilized.

The management while accepting the audit observation stated (June 2014) that prospective beneficiaries were being pursued for allocation of surplus power. Ministry also stated (February 2015) that the Corporation had been exploring for allocation of surplus power.

### 3.4.3 Loss of additional Return on Equity

In terms of CERC Regulation 2009 applicable for the period 2009-2014, an additional return on equity at the rate of 0.5 *per cent* is allowed each year during the life of the projects if they are commissioned within the specified timeline. This guideline is applicable w.e.f. 1<sup>st</sup> April 2009. It was observed that all the power projects earmarked for execution during the XI Plan period were not commissioned within the timeline as specified. The ongoing projects were also lagging behind such specified timeline. Therefore, the Corporation lost the opportunity to earn additional return on equity of ₹ 1011.73 crore for all the power projects of XI Plan period. [Completed projects ₹ 671.29 crore and ongoing projects ₹ 340.44 crore (Annexure VIII)].

The management stated (June 2014) that the loss of incentive due to delay in execution of projects during the XI Plan Period were beyond the control of the Corporation and could not be termed as foregone additional return on equity. This is not acceptable in view of the fact that various reasons for delay were under the control of the management as discussed in Para 3.2.

Ministry noted (February 2015) the audit observation.

### 3.4.4 Performance of the units commissioned under XI Plan

#### 3.4.4.1 Capacity utilisation

Audit observed that the capacity utilisation of all the five units commissioned under XI Plan was lower and ranged between 26.59 *per cent* and 68.37 *per cent* upto March 2014 since their respective CODs (excepting MTPS # 7 during 2012-13 where the capacity utilisation was 74.52 *per cent*) (Annexure - IX). It was also observed that the main reason for such low capacity utilisation was forced outage of the units due to boiler tube leakages, problems/troubles in Turbo Generator, electrical system and Control & Instrumentation etc.

<sup>13</sup> MTPS unit # 7 & 8- ₹ 1.82/ unit, DSTPS unit # 1 & 2- ₹ 2.37/ unit and KTPS unit # 1- ₹ 2.40/ unit

<sup>14</sup> MTPS Unit # 7 & 8- ₹ 5363 crore, DSTPS Unit # 1 & 2- ₹ 5862 crore and KTPS Unit # 1- ₹ 3338 crore (50% of ₹ 6676 crore)

The units could not generate 2345.27 MU of power due to the above outages for which the Corporation suffered loss of ₹ 476.66 crore towards non-recovery of fixed cost during the period from 2011-12 to 2013-14 (Annexure - X). The other major reasons for low capacity utilisation of the units were non-availability of prospective customers mainly on account of higher cost of power (refer to para 3.4.2) and shortage of coal.

Ministry in its reply (February 2015) stated that the lower capacity utilisation of the units was due to various operational problems as pointed out by audit.

#### 3.4.4.2 Auxiliary power consumption

The auxiliary power consumption is an important index to determine as to how efficiently a power plant is operating. It is, therefore, essential to reduce the same to acceptable limits. Frequent outages of the power plants resulted in high auxiliary power consumption. Further, inefficient Air Pre-Heating (APH) system also leads to increase in such consumption. CERC fixed the norms for auxiliary power consumption of the power plants depending upon their capacity and expressed as a percentage of the gross energy generated. It was observed that the auxiliary power consumption of Unit # 7 of MTPS in 2011-12, both the units of DSTPS in 2012-13, Unit # 2 of DSTPS and Unit # 1 of KTPS in 2013-14 was more than the CERC norms. Due to such excess auxiliary power consumption (48.47 MU), the Corporation suffered loss of revenue to the extent of ₹ 20.05 crore (Annexure XI). The main reasons for excess auxiliary consumption were inefficient operation of other auxiliary equipments like Induced Draft (ID)/ Primary Air (PA)/ Forced Draft (FD) fans and APH.

Ministry stated (February 2015) that frequent shut down and start-up of the units due to inefficient operation of various auxiliary equipments was the main reason for higher auxiliary power consumption.

#### 3.4.4.3 Fuel consumption

The efficient and economic use of the fuel assumes a very significant role in power generation as the cost of fuel (coal and oil) constitutes about 70 *per cent* of the total cost of power generation. As per CERC regulation, gross station heat rate is fixed for a particular unit as per its capacity. However, consumption of coal depends upon the gross calorific value of the coal received by a particular unit for a particular period. It was observed in audit that the new units maintained the required station heat rate as per CERC norms.

Oil is used for start-up and stabilization processes. CERC fixed norms for consumption of oil for different thermal power units for different periods. The norms for oil consumption of the above five units was 1.0 ml/Kwh. Audit, however, observed that the consumption of oil in respect of two units of DSTPS and one unit of KTPS was more than the norms upto March 2014. As the excess oil consumption was not recoverable through tariff, the Corporation suffered loss of ₹ 88.89 crore being the cost of excess consumption of oil (Annexure - XI). Ministry stated (February 2015) that frequent shut down and start-up of the units due to failure of boiler tubes, inadequate ash pond capacity and shortage of coal were the main reasons for higher oil consumption.