Chapter-4

4 Project Implementation

4.1 Contract Management

The contract management is a process of systematically and efficiently managing contract creation, execution and analysis for the purpose of maximizing financial and operational performance and minimizing risk.

Audit examined in detail various stages of contract management inter-alia contract planning, preparation of tender documents, invitation of bids, receipt and opening of bids, processing and evaluation of bids, pre-award discussion with the recommended bidder, award of contract, post-award implementation of contract, contract amendments and contract closing in respect of 146[20] contracts. Results of examination are discussed in subsequent paragraphs.

4.1.1 Cost Estimation

4.1.1.1 Cost estimation for each package having various elements is prepared to establish the reasonableness of the cost at which package could be executed. Therefore, it is essential that the estimates are worked out in a realistic and objective manner. The Company is preparing the cost estimate on the basis of average purchase price of the previous contracts awarded and same is escalated to the current level of price. As such Company does not prepare cost estimates on current market prices of various elements as no data bank for the same exists.

Audit observed that in 57 contracts (39 *per cent*), variation (positive as well as negative) between estimated costs and award cost ranged between 10 to 54[21] percent ***(Annexure-VI)*** which indicates that cost estimates were not realistic and no fresh analysis was being carried out by the Management.

The Management stated (November 2010) that the updated cost estimates are an indication of the prices prevailing as on the date of cost estimate. However, bid prices at times are influenced by many uncertainties, due to which the variations between cost estimate and bid price occur.

Management's reply is not acceptable as cost estimates should be prepared on the basis of current market prices of the various elements of materials/equipments required for construction of power plant instead of depending on the last awarded prices as these may not always represent current market prices.

---

[20] *Sample selected as discussed in Para 2.8*

[21] *10 to 20 per cent in 32 contracts, 20 to 30 percent in 16 contracts, 30 to 40 per cent in 5 contracts and above 40 per cent in 4 contracts*

4.1.1.2 It was further observed that out of 57 contracts (mentioned in para 4.1.1.1 above) the Company accepted substantially higher rate from estimated cost ranging between 10.25 *per cent* to 33.55 *per cent* in 22 contracts due to paucity of time and tight schedules which indicate lack of co-ordination and synchronisation of various activities of the contract. Though such rates should not be the guiding factor for preparation of subsequent estimates, there existed no system to exclude such cases for preparation of future estimates.

The Management stated (November 2010) that packages which have been accepted with substantially higher and unreasonable rate from estimated cost due to paucity of time and tight schedules were now being generally kept out of purview of future cost estimate.

The reply is not acceptable as Company had considered rates of works awarded on emergent basis for preparation of subsequent estimates e.g. estimate of Coal Handling Plant of Farakka-III was based on rates of Barh-I which was 28 *per cent* higher than estimate. Similarly, cost estimate of main plant & off-site area civil works package for Barh-II was prepared on the basis of similar package of Barh-I which was awarded at 22 *per cent* higher than estimate.

4.1.1.3 Audit also observed that three projects[22] were completed within approved cost despite significant time overrun of 9-33 months and increase in the prices of Steel and Cement by 61 *per cent* and 76 *per cent* respectively from 2003 to 2010. This indicates that cost was not estimated on real-time basis and appears to be unrealistic.

4.1.2 Invitation and evaluation of bids

4.1.2.1 Qualifying Requirement

The Qualifying Requirement (QR) of prospective bidders was decided on the basis of recommendation of a standing committee called QR committee. The QR was disclosed in the notice inviting tenders (NIT). Audit examined the records to verify whether the QR was fixed judiciously and generated adequate competition.

Audit observed that in 14 cases, QR was relaxed after NIT to bring more prospective bidders within qualifying criteria ***(Annexure-VII)*** due to inadequate response from the bidders. This indicated that proper analysis as regards fixing of QR had not been made. Subsequent change in QR contributed towards delay in completion of the pre-order activity. Further, in 12 out of 14 cases, the Company allowed 9 to 18[23] days for bid submission subsequent to revision in QR. The time allowed was insufficient for global tenders. As a result, except in one case, there was either nil response or very poor response even after revision of QR.

The Management while agreeing with Audit stated (November 2010) that in order to reduce the possibility of need for revision of QR after NIT, action for collection of vendor data base through expression of interest has been taken and new QRs are prepared taking into account the vendor data base.

---

[22] *Kahalgaon-II, Sipat-II and Bhillai.*

[23] *Against four weeks generally allowed by the Company for bid submission.*

4.1.2.2 Notice Inviting Tenders

To achieve synchronization date of the project, it is necessary that NIT for each package is issued as per schedule mentioned in master network. However, audit observed that out of total 146 contracts examined in audit, in case of 34 contracts, delays of one to 17 months were noticed in issuing NIT due to delay in finalization of tendering documents.

4.1.3 Awarding of contract

Of 146 Contracts examined in audit, 135[24] contracts related to construction of Thermal projects and remaining 11 were for construction of Hydro projects. Issues related to awarding of these thermal and hydro projects are discussed below:

4.1.3.1 Thermal projects

- For achieving the Capacity Addition Programme by March 2012, the Company should have ensured during the initial period that there was no slippage in awarding of the main plant Packages. It was observed that due to excessive time taken during pre-order activities, awarding of main plant contracts in six projects was delayed. As a result, capacity of 5210 MW right away slipped beyond March 2012 by 7 to 20 months as is evident from the table given below:

Sl. No.	Name of the Project	Capacity to be added (in MW)	Date of award of main plant contract	Scheduled date of completion as per Investment Approval (Unit-I / Unit)	Delays beyond March 2012 in scheduled completion (in months)	Reasons of delay in award of main plant contract
1.	Barh-II (2 x 660)	1320	14.10.08	January 2013 / November 2013	20	Delay in finalization on main plant contract
2.	Mouda (2x500)	1000	28.11.08	May 2012/ November 2012	8	Delay in acquisition of land
3.	Rihand-III (2x500)	1000	18.02.09	July 2012/ January 2013	10	Delay in initiation of pre-order activities
4.	Vindhyachal-IV (2x500)	1000	18.02.09	July 2012/ January 2013	10	Delay in initiation of pre-order activities
5.	Vallur, Phase-II (1x500)	500	28.07.09	January 2013	10	Delayed decision about project size
6.	Muzaffarpur Expansion (2x195)	390	12.03.10	October 2012/ January 2013	10	Delay in finalization of configuration of unit size
	TOTAL	**5210**				

[24] *Main plant Packages-32; Balance of Plant-103*

The Management stated (November 2010) that the award of work in case of Barh –II was delayed due to extension of time at the request of bidders and considerable time was taken to resolve various deviations of the package with BHEL as it was the first super critical project for BHEL. In case of Vallur project, the decision to add one more 500 MW unit was taken subsequently with the announcement of Hon'ble Minister of Power at the foundation stone laying ceremony.

Audit does not agree with the Management because the Company took inordinate time to resolve the issues associated with the award of main plant packages. The feasibility of adding one more unit at Vallur project should have been examined and decided at the stage of initial planning itself.

- Master network in respect of every project had to be developed indicating matching programme for each balance of plant contracts such that synchronization of the project is achieved as per schedule agreed for main plant contract. A review of awarding of 103 balance of plant contracts revealed that in 74 contracts, master network dates were not adhered to and delays ranging between one and 24 months were noticed as is evident from the table given below:

Range of delay (in months)	Number of contracts	Name of the Projects
One to three months	27	Barh-II, Farakka-III, Kahalgaon-II, Korba-III, Dadri-II, Simhadri-II, Sipat-I, Sipat-II, Jhajjar,
More than three up to Six months	23	Barh-I, Barh-II, Bongaigaon, Farakka-III, Kahalgaon-II, Korba-III, Dadri-II, Simhadri-II, Sipat-II, Vallur, Jhajjar
More than six but up to nine months	7	Barh-I, Kahalgaon-II, Dadri-II, Simhadri-II, Vallur,
More than nine up to 12 months	10	Barh-I, Bongaigaon, Farakka-III, Korba-III, Nabinagar, Vallur,
More than 12 and up to 24 months	7	Korba-III, Nabinagar, Vallur,

These delays could have been avoided as they had significant impact on the overall progress of the projects.

The Management stated (November 2010) that various activities like finalization of QRs, cost estimates, assessment of new bidders, extension of bid opening date to enhance competition could not be anticipated in advance and hence could not be taken into account while finalising the Master network.

The reply is general and does not address the specific cases pointed out in Audit. Further, since these activities are part of the normal award process these could have been expedited through proper planning.

- Further, in addition to sample of 146 contracts selected, 15 critical packages of seven projects as detailed in Annexure-VIII were awarded with delays of 8 to 27 months. As a result, Capacity Addition Programme suffered significantly.

The Management stated (November 2010) that delay was mainly due to extension of bid opening dates at the request of the bidders to enhance competition, re-tendering due to higher prices, sorting out technical and commercial issues with bidders, delay in finalisation of QR and specifications in some cases.

We do not agree with the Management because in most of the cases, the NIT itself was issued by the Management close to the scheduled date of award of contract as per the Master network and thus sufficient time was not available to evaluate and finalise the bids by the scheduled date. Further, finalisation of QRs and technical specifications which were controllable activities could have been expedited by the Management.

4.1.3.2 Hydro Projects

The date of commissioning of the hydro projects was to be worked out from the date of award of the first contract of main civil works package as per TEC issued by CEA. In order to achieve the capacity addition program (2007-12), the first contract for main civil work of hydro projects should have been awarded after TEC at the earliest. However, it was observed that the Company had taken inordinate time ranging from 18-27 months for awarding of first package of main civil works from the date of TEC as is evident from table given below:

Sl. No.	Name of the Project	Date of TEC	Date of award of first package of main civil work	Time taken from TEC to award
1	Koldam	30.6.02	12.12.03	18
2	Loharinag-Pala	11.8.04	06.07.06	22
3	Tapovan-Vishnugad	11.8.04	28.11.06	27

Project wise delays were attributed to:

(i) Changes in project parameters (June and December 2005) after TEC clearance due to provision of Pelton turbine in place of Francis turbine in Loharinag-Pala and Tapovan Vishnugad projects,

(ii) Changes in construction methodology (August 2005) of Head Race Tunnel from Drill & Ballast Method to Tunnel Boring Machine after TEC clearance in Tapovan Vishnugad project,

(iii) Management's decision to review the bidding procedure for civil works when tenders already invited under two stage bidding were under evaluation in case of Loharinag-pala project. This led to holding up of tendering process for three months (February 2006 to April 2006).

The Management stated (November 2010) that in case of Loharinag Pala and Tapovan Vishnugad projects the land acquisition could be started only after accord of TEC by CEA and ground activities of transfer of forest land starts after accord of forest clearance.

We find it difficult to agree with the reply because action for land acquisition and forest clearance should have been initiated simultaneously with the proposal for Techno-economic clearance to avoid project delay as is being done by other power majors like NHPC Limited for their hydro projects. The forest clearance was applied by the Company for Tapovan Vishnugad and Loharinag Pala projects after 11 and 8 months respectively from techno-economic clearance. In fact the Ministry of Environment and Forests had accorded the forest clearance within one month of the application in both the cases.

4.2 Execution of project

Time is the essence of every contract for achieving completion of any work as per agreement between two parties. Audit examined the execution of contracts awarded for construction of projects under capacity addition programme. The results of such examination highlighting the main reasons for project-wise delays are stated below:

4.2.1 Thermal projects

4.2.1.1 Kahalgaon-II (2x500 MW)

Sl. No.	Scheduled COD*	Actual COD	Delays in completion (in months)	Financial progress/ status as on March 2010
6	July 2007	December 2008	17	Completed
7	June 2007	March 2010	33	Completed

**Commercial operation Date*

Delays were attributable to slow progress made by the main plant civil contractor and delayed supply by main plant contractor. Delay is also attributable to shortage of coal because of which 9 months ***(Annexure-IX)*** were taken for COD after synchronization against normal time of three months[25].

It was also observed that even after COD, the plant is not operating at the desired PLF[26] due to shortage of coal. The PLF of the plant which was 100 *per cent* in May 2007 slipped to 56 *per cent* (July 2010) after completion of the project due to shortage of coal. The fuel supply agreement was yet to be finalised by the Company (May 2010).

Had the management explored the possibility of meeting the shortage of coal from alternate sources, idling/under-utilisation of capacity could have been avoided. Thus, the objective of capacity addition by this project is partially defeated.

The Management accepted the shortage of coal and stated (November 2010) that measures had been taken to mitigate the shortage of coal by entering into MOUs with coal companies, procuring coal through e-auction, diversion of coal from Northern Coalfields Limited, import of coal and improved haulage of coal through Inland Waterways transport from Haldia to Farakka.

[25] *As per guidelines of the Company regarding synchronization, full load and declaring under commercial operation of thermal projects.*

[26] *85% at which full fixed charges are recoverable through tariff as per CERC Regulations.*

4.2.1.2 Sipat-II (2x500 MW):

Unit No.	Scheduled COD	Actual COD	Delays in completion (in months)	Financial progress/ status as on March 2010
4	September 2007	June 2008	9	Completed
5	March 2007	January 2009	9	

The delay in commissioning of the project was due to delayed supply of material by the main plant contractor and non-availability of water for trial run and operation. The later being a pre-order activity should have been resolved timely with the State Government. Delay is also attributable to inordinate time of 8 months ***(Annexure-IX)*** taken against normal time of three months for COD after synchronization of units due to shortage of water.

The Management stated (November 2010) that water availability was properly tied up and the Company started drawing water from May 2006 as per the condition of the letter of allotment. However, due to change in attitude, the State Government decided to cancel the water allocation and returned the cheque which was paid to them on account of water usage.

Audit does not agree with the Management as water allotment was cancelled by the State Government because the Company had neither drawn allotted water within prescribed period up to November 2006 nor deposited commitment charges before February 2007 for extension of water allotment as demanded by the State Government.

4.2.1.3 Bhilai JV (2x250 MW)

Unit No.	Scheduled COD	Actual COD	Delays in completion (in months)	Financial progress/ status as on March 2010
1	January 2008	April 2009	13	Completed
2	July 2008	October 2009	13	

Bhillai JV project could not progress satisfactorily owing to poor mobilization & slow progress by sub-agencies of the main plant contractor and late/non-sequential supply by Main plant Contractor.

Further delay of 8 months (Annexure-IX) was noticed in synchronization from oil (April 2008) to coal firing (January 2009) due to delay in supply, erection and commissioning of Milling System, bunker erection and insulation work.

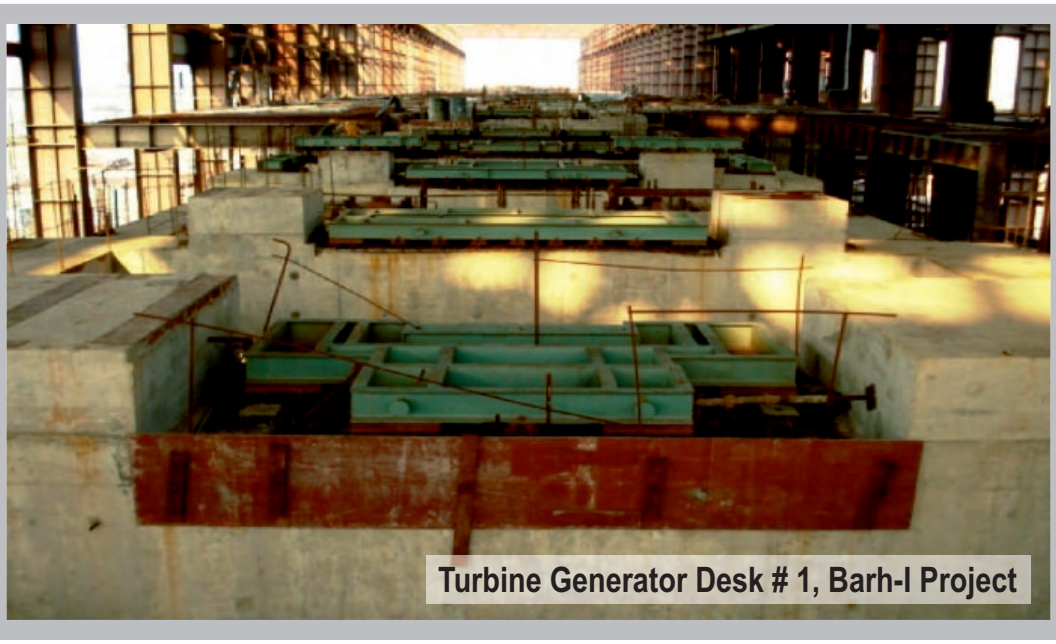
The Management while accepting (November 2010) the reasons for delay added that the issues were taken up at the Apex level meetings with the main plant agency and civil agency to expedite the process.

Audit observed that the problem arose because the Company had relied mainly on a single vendor for main plant packages who had failed to adhere to the schedule date in most of the projects. The contractors' base should have been widened to avoid issues like poor mobilization and slow progress by the contractor during execution stage.

4.2.1.4 Barh-I (3x660 MW)

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	June 2009	February 2013	44	55%
2	April 2010	August 2013	40	
3	February 2011	February 2014	36	

Tardy progress of above projects is due to late commencement of erection of steam generator by the contractor. Audit observed that a contractual dispute has arisen between the company and the Contractor due to commercial issues including removal of price variation ceiling of 20 *per cent*. The management did not take timely action for resolving this issue and the dispute is yet to be resolved.

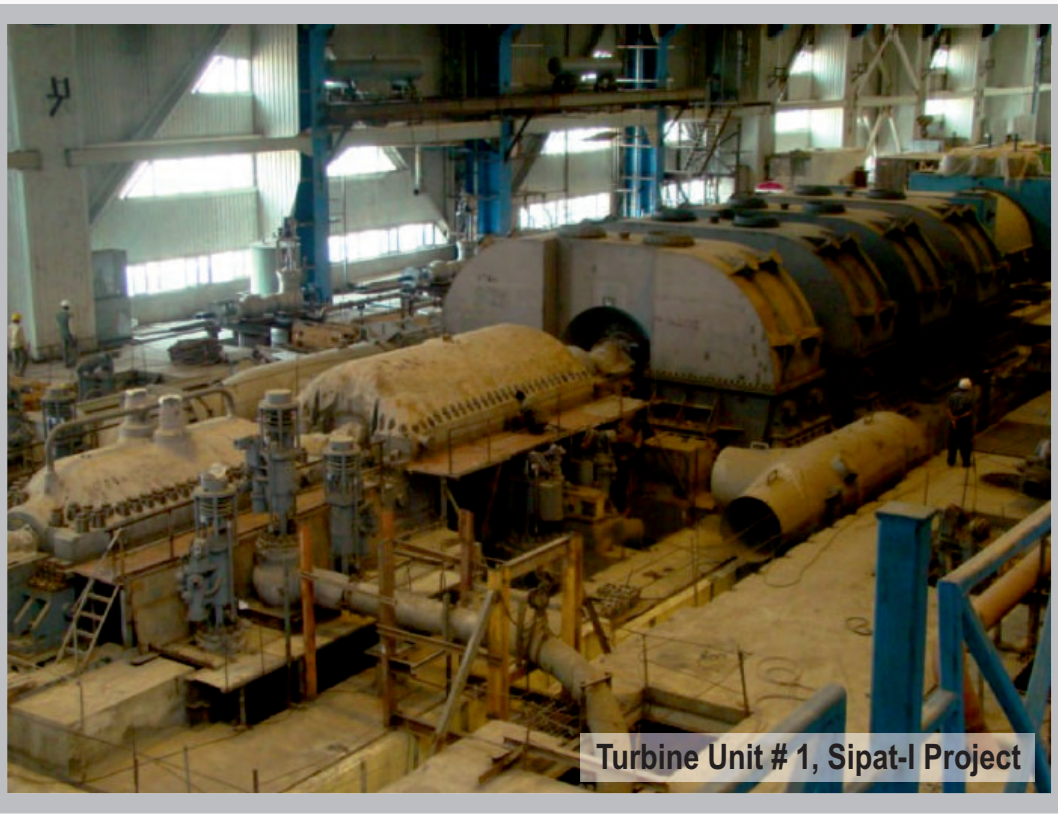


Turbine Generator Desk # 1, Barh-I Project

4.2.1.5 Sipat-I (3x660 MW)

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	June 2008	January 2011	31	82%
2	April 2009	July 2011	27	
3	February 2010	January 2012	23	

The Management took inordinate time[27] to resolve the contractual disputes relating to time extension and removal of price variation ceiling of 20 percent with the main plant contractor. Further, there were also late supply of critical equipments & materials by main plant contractors. Due to above, the project has missed the scheduled COD as indicated above.



Turbine Unit # 1, Sipat-I Project

In respect of Barh-I and Sipat –I, th e Management merely stated (November 2010) that the delay was due to dispute with the main plant contractors.

The fact is that the disputes arose because of the contractual provision limiting escalation to 20 *per cent* without any flexibility to enable the Company to deal with delay by the Company itself in providing necessary inputs. Thereafter, the Company took an inordinate amount of time to change the contract terms and put the implementation of the contracts back on track.

4.2.1.6 Simhadri-II (2x500 MW):

Unit No.	Scheduled COD	Actual COD	Delays in completion (in months)	Financial progress/ status as on March 2010
3	February 2011	March 2011	1	59%
4	August 2011	April 2011	0	

[27] *Settled in September 2009.*

Poor mobilization of manpower & machinery by the Civil Work agency and delay in finalization of erection agency by the main plant contractor were the main reasons of delay. Diversion of IP turbine meant for this project to Jhajjar project which is linked with Common Wealth Games having cascading effect on the overall project schedule may further increase the anticipated delays as the financial progress upto March 2010 was only 59 *per cent*.

The Management accepted (November 2010) that the project was delayed due to diversion of IP turbine of this project to Jhajjar project which was targeted to be commissioned for the Commonwealth games.

Audit observed that even after delaying the Simhadri project due to diversion of IP turbine, the Company could not complete its Jhajjar project before the Commonwealth Games.

Unit 3&4, Simhadri-II Project

CW & Make up water civil ducts erection in front of Cooling Water Pump House

4.2.1.7 Vallur JV (3x500 MW):

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	February 2011	November 2011	9	31%
2	August 2011	January 2012	5	
3	December 2012	December 2012	0	

The reasons for slow progress were (i) late supply of critical equipments, (ii) late deployment of high capacity cranes and (iii) delay in finalization of erection agency by the main plant contractor. Further, the Company had also not awarded critical balance of plant packages in time with respect to master network.

The Management stated (November 2010) that delay was mainly on account of BHEL not meeting its target schedule and added that the decision to add one more 500 MW unit was taken subsequently with the announcement of Hon'ble Minister of Power at the foundation stone laying ceremony.

Force Draft Fan # 1 B erection intermediate pressure turbine, Vallur Project

Audit does not agree with the Management because the feasibility of adding one more unit at Vallur should have been examined and decided at the stage of initial planning itself to avoid delays.

4.2.1.8 Korba-III (1x500 MW)

Unit No.	Scheduled COD	Actual COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
7	May 2010	November 2010	6	81%

Execution of this project started in March 2006. However, due to poor mobilization of manpower and machinery by the civil work agency and delayed supply of critical equipments by the main plant contractor, this project missed the scheduled COD. Based on financial progress achieved upto March 2010, the project may not be commissioned even by the anticipated COD.

The Management accepted (November 2010) that there were delays in civil work and added that they had reviewed the progress with the highest level of civil agency. As no significant improvement was forthcoming, they had to blacklist the civil agency for future contracts.

We do not agree with the Management because the main plant civil work was awarded in September 2006 and the slow progress was evident from the initial stages itself. The Management, however, took up the high level review with civil agency only in April 2010 just before the scheduled date of commercial operation.

4.2.1.9 Farakka-III (1x500 MW):

Unit No.	Scheduled COD	Actual COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
6	November 2010	March 2011	4	65%

The main plant contractor did not finalise erection agencies in time and also made late supply of materials. Slow progress of work by civil contractors was another reason for delay of project.

Audit also observed that existing units of Farakka projects have consistently witnessed generation loss during the last three years[28] due to shortage of coal. With addition of one more unit of 500 MW which the management anticipates to commission in March 2011, the situation would worsen further as witnessed in Kahalgaon-II. Thus, coal supply issue should be resolved in advance.

The Management accepted (November 2010) that there was delay in finalisation of erection agency by BHEL and slow progress in civil works. The Management added that to avoid delay, NTPC allowed BHEL to part award the erection work.

The fact remains that despite steps taken by the Management there was delay of four months from the scheduled date of commercial operation.

4.2.1.10 Bongaigaon (3x250 MW):

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	February 2011	August 2011	6	25%
2	June 2011	February 2012	8	
3	October 2011	April 2012	6	

The Bongaigaon project was delayed due to slow progress of work by main plant civil work contractor and delay in appointing of erection agencies by the main plant contractor. It is observed that the delay in project completion would be much more than that anticipated by the management because Coal Handling Package with work schedule of 30 months was awarded in January 2010 only.

The Management accepted (November 2010) that civil agency took inordinate time to complete the civil works and showed no improvement in spite of repeated requests. The work was, therefore, offloaded from the civil works agency. Further, 80 days of work had been lost on account of Bandhs alone as the project is in the disturbed Bodoland area of Assam.

We do not agree with the Management because the civil work was awarded (March 2008) in this project to the same agency who had already been performing slow in Korba-III project. Further, 80 days lost on account of bandhs do not justify the total delay of six to eight months in different units of the project.

[28] *2007-08: 655 MUs; 2008-09: 1284 MUs; 2009-10: 2123 MUs*

4.2.1.11 Nabinagar (4x250 MW):

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	January 2011	October 2012	21	10%
2	July 2011	February 2013	19	
3	January 2012	June 2013	17	
4	July 2012	October 2013	15	

This project was conceptualized in January 2002. Main plant contract was awarded in January 2008 but work was started in January 2010 as possession of land was acquired between July 2009 and December 2009. Audit also observed that the Company released (March 2008) interest free advance of ₹ 256 crore to the contractor though land was not in the possession of the Company. As a result, the advance of ₹ 256 crore remained blocked for twenty one months on which NTPC had to forego interest income of ₹ 45 crore.

The Management stated (November 2010) that land acquisition in the project was delayed due to floods, elections and other hurdles.

The reply does not address the audit observation regarding award of work of main plant before acquisition of land.

Civil Works in progress, Nabinagar Project

4.2.2 Hydro Projects

4.2.2.1 Koldam HEP (4x200 MW)

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	December 2008	April 2012	40	71%
2	February 2009	April 2012	38	
3	April 2009	April 2012	36	
4	May 2009	April 2012	35	

Management's anticipation of commissioning the project in April 2012 is doubtful in view of poor progress of main dam contractor. Balance quantity of clay filling and spillway concreting at the end of July 2010 was 6.95 lakh cubic metres and 2.29 lakh cubic metres, respectively. However, on the basis of average monthly progress of 0.38 lakh cum and 0.062 lakh cum achieved during January 10 to July 10 another 18 and 37 months would be required to complete the above critical items. Besides six months would be required for impounding of Dam before commissioning. Poor equipment availability and cash flow problem of the Dam contractor are the main reasons for slow progress on the project.

The Management stated (November 2010) that the delay was on account of right bank slide, increase in quantities for grouting and cash flow problem of the contractor. The project is anticipated to be commissioned in March 2013.

Audit finds it difficult to agree with the Management because these reasons do not justify inordinate delay of 47 to 52 months.

4.2.2.2 Loharinag Pala HEP (4x150 MW)

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	May 2011	October 2012	17	23%
2	July 2011	November 2012	16	
3	September 2011	December 2012	15	
4	November 2011	January 2013	14	

Work on the project is under suspension since February 2009 because of environment issues. There are also indications that Government of India has decided to scrap this project. As a result, an amount of ₹ 660.61 crore incurred so far (upto March 2010) would become infructuous.

The Management stated (November 2010) that Ministry of Power was finalizing a note for approval of Union Cabinet to compensate NTPC for project related expenditure and commitments to avoid any financial loss.

4.2.2.3 Tapovan-Vishnugad HEP (4x130 MW)

Unit No.	Scheduled COD	Anticipated COD	Anticipated delays in completion (in months)	Financial progress upto March 2010
1	October 2012	October 2012	Proposed to be commissioned on best efforts basis.	28%
2	December 2012	December 2012		
3	February 2013	February 2013		
4	April 2013	April 2013		

Management's claim of commissioning the project between January 2012 and April 2012 on Best Effort Basis is not supported by the progress on the project. Out of 12087 meter of Head Race Tunnel excavation to be done, only 4,479 metre was done by July 2010 and average monthly progress achieved during last six months was just 80 meter. Further Desilting Basin concreting (total quantity 1,23,500 cubic metres) is yet to be started (December 2009) for which 32 months are required as per terms of the contract agreement.

Company's failure in handing over inputs like working fronts free from encumbrances, Intake Adit, approach roads to work sites, construction power, etc. in time to the contractors and uncontrollable reasons like adverse geological occurrences and stoppage of work due to local problems attributed to delay in project implementation.

The Management stated (November 2010) that the delay was due to cash flow problem of the contractor, delay in land acquisition and geological occurrences.

Audit observed that action for land acquisition and forest clearance should have been initiated simultaneously with the proposal for Techno-economic clearance to avoid project delay. The Company was able to remove all hindrances from the working fronts in the Barrage package only by December 2008 i.e. after 20 months after start of excavation work in April 2007.

4.2.3 Analysis of reasons for delays

Reasons responsible for delay in execution of thermal projects indicated in Para 4.2.1 were also examined. It revealed that poor performance of the Civil Contractors and delay in supplies of material by the main plant contractors emerged as common and significant reasons in all thermal projects under capacity addition programme. Besides, contractual disputes in two projects[29] also led to delays. A further analysis of these two reasons revealed the following:

- The main plant packages (i.e. SG and TG) of 17 out of 19 thermal power projects were awarded by the Company to a single vendor without assessing capacity and capability to deliver. The vendor had not always furnished information regarding capacity in hand and balance capacity

[29] *With Doosan & Power Machine in case of Sipat-I whereas with TPE & PM in case of Barh-I.*

along with bid and the Company also did not insist for the same, though required as per tender documents. The Administrative Ministry had also raised (July 2007) concern on delay in material supply by the main plant contractor and desired that due diligence be done regarding manufacturer's capacity to deliver.

- As far as award of main plant civil works contract was concerned, the contractor who was found responsible for slow and delayed progress in earlier completed/ongoing projects was recommended for award on the basis of L1 position by following single stage bidding system. It was observed that such recommendations were made by the management on the plea that issues which caused delay would be discussed and tied up during post-bid discussions. Such tie ups, however, did not prove effective as same reasons of delays were noticed in subsequent contracts also.

Audit also observed that out of 14 contracts related to main plant civil works, seven[30] contracts were awarded to one contractor viz. ERA Construction (India) Limited, which failed in mobilizing adequate manpower and timely handing over front to main plant contractor in case of Simhadri-II, Mouda and Kahalgaon-II. The administrative ministry also raised concern over delay in carrying out civil works and directed (December 2008) the Company to assess the desirability of awarding future contracts to the defaulting contractors/agencies.

The Management stated (November 2010) that based on the competitive bids invited; ERA Construction was found to be lowest and was awarded the work.

We find it difficult to accept the reply of the Management because the past performance of the contractor should also have been considered by the Company before award of work.

Bidding Documents provided that actual payment of escalation at any stage would not exceed 20 percent of cumulative price of plant and equipment already supplied (in case of supply contracts) and 20 to 23 percent of the contract price as awarded (in case of civil works). The contractual provision also states that in case of delay on the part of the Company in handing over site, drawings, instruction, etc., the Company would consider suitable time extension with price variation within overall ceiling (not compensation). Both these provisions taken together are totally inequitable and, while they succeed in limiting the liability of the Company, they provide little comfort to the contracting agencies especially when inputs to be provided by the Company or interfacing contractors are delayed substantially which ultimately affects progress of the project. Such a clause has been found to be the main cause of dispute with main plant contractors of Barh-I and Sipat-I.

Power Machine, Russia (main plant contractor of Sipat-I) raised (July 2008) claim for additional price variation beyond contractual limit of 20 *per cent*. The Company though accepted (September 2009) the claim of Power Machine, Russia, the similar issue raised by main plant contractor of Barh-I is yet to be resolved.

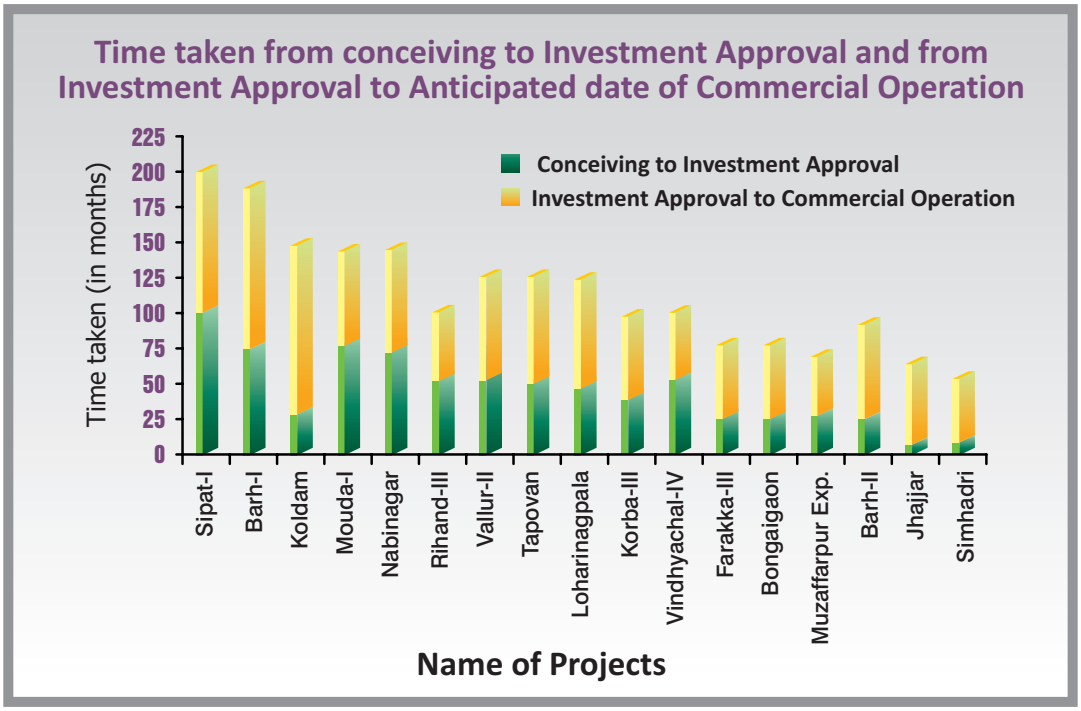
[30] *Dadri-II, Simhadri-II, Jhajjar, Mouda, Nabinagar, Kahalgaon-II and Sipat-I.*

4.2.4 Other points of interest

Other points of interest noticed during examination of records related to award and execution of contracts are listed in ***Annexure-X*** along with Management's reply and further remarks. These observations mainly related to relaxation of QRs to suit a specific party, ambiguity in interpretation of QRs, fixation of unreasonably high QRs, fixation of QRs irrespective of schedule of erection and quantity to be executed, acceptance of experience of unrelated work, excessive interference by the Company in selection of sub-vendors by the vendors, uncertainties in tender documents of civil contracts of hydro works, award of work to ineligible bidder, improper assessment of reasonableness of price, relaxation of tender conditions at the time of conclusion of contracts and non-compliance of IS Code relating to safety of structures.

4.2.5 Overall time taken for Planning and execution of projects

- Based on the anticipated date of commercial operation of the 17 ongoing projects, the Company would take 60 to 200 months from conceptualization to commercial operation. More than 10 years would be taken in respect of five thermal projects[31] and three hydro projects[32] as is evident from the following chart:



- Further, it has also been observed that in the four projects[33] completed so far, management has taken 75 to 137 months ***(Annexure-IV)*** from the date of conceptualization to commercial operation. Thus, systematic approach was not adopted by the Company from conceptualization to commercial operation.

[31] *Sipat-I, Barh-I, Mouda, Vellure and Nabinagar*
[32] *Koldam, Tapovan and Loharinag Pala*
[33] *Kahalgaon-II, Sipat-II, Bhillai and Dadri-II*

4.3 Conclusion

From the above, it is evident that cost estimates were not realistic and not based on current market prices of inputs. The management has followed single stage single envelope bidding system instead of single stage double envelope – the latter is well recognized as a better practice. Contracts were awarded with delays affecting the schedule of the projects. The main plant and civil works contracts were not awarded judiciously. The management took inordinate time in finalizing the main plant contracts and balance of plants packages which should have been avoided for speedy completion of the project. The management was very slow in reacting to mid-stream contractual disputes and problems. Overall, it was observed that the management has been taking upto 200 months (16 years plus) from conceptualization to COD.