



भारत सरकार

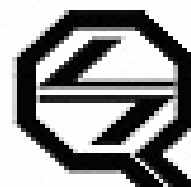
GOVERNMENT OF INDIA

केंद्रीय विद्युत प्राधिकरण

Central Electricity Authority

ताप विद्युत नवीनीकरण एवं आधुनिकीकरण प्रभाग

Thermal Renovation and Modernisation Division



Quarterly Review Report

Renovation & Modernisation of Thermal Power Stations
{2nd Quarter of 2013-14, (July – September, 2013) during 12th Plan}

C O N T E N T S

Sl No.	Description	Page No.
	Highlights	01-02
1.0	Introduction	03
2.0	Objective of R&M programme	03
3.0	Objective of LE programme	03
4.0	R&M and LE programme from 7th Plan onwards till 11th Plan	03-04
5.0	National Perspective Plan	04
6.0	LE/R&M Programme during 12th Plan (2012 – 17)	04-05
6.1	Achievement of LE/R&M Programme during the 12th Plan up to 30th September 2013	05
6.2	Status of R&M activities under BRGF Scheme	05-06
7.0	Future Vision for LE & R&M programme	07
8.0	External Co-operation for R&M of TPS	07
8.1	Energy efficiency R&M programme funded by KfW	07-08
8.2	Development of Tender Procedure and Model Contract for R&M of Fossil fuel based Power Plant	08-09
8.3	Coal Fired Generation Rehabilitation programme funded by World Bank	09-12
8.4	Japan-India co-operation for Pre- Primary study of Efficiency and Environmental improvement of Coal fired stations	13
8.5	Training programme on R&M and Operational Practices	13
Appendix-I	List of units where Life Extension/ Renovation & Modernisation works have been completed/ taken up during 12th Plan as on 30.09.2013 (1/6 to 6/6)	
Appendix- II	Broad Status	

Foreword

Electric energy is the driving wheel of modern Industries. Accordingly Govt. of India have taken a number of initiatives which, inter-alia, include new multi modal electricity generation capacity addition. To further supplement the above efforts in the area of efficient power generation, Renovation & Modernization (R&M) and Life Extension (LE) of the existing old power stations have been recognized as one of most cost-effective options.

The Thermal Renovation & Modernization (TRM) Division is entrusted with the responsibility of monitoring the progress of R&M/LE activities costing more than ₹ 100 Crore in thermal power generating units in the country. Based on the information received from various utilities undertaking the R&M/LE works, the Quarterly Review Report (QRR) is prepared and circulated to senior officers in MOP and CEA to keep them abreast with the latest status of the physical and financial progress of R&M/LE works at various thermal units. The QRR is also available on CEA website <http://cea.nic.in>

During the year 2012-13 R&M works at DPL TPS unit-6 (110 MW), Patratu TPS unit -10 (110 MW), Anpara' A (3x210 MW), Tanda Unit -2 (110 MW) and LE works of Bhatinda TPS unit -3 (110 MW) & Kawas GT-1A (106 MW) have been completed. The LE works at Parichha unit-2 (110 MW) has been completed during 1st Quarter of 2013-14 and that of Muzaffarpur TPS Unit #1 (110 MW) has been completed on 5th July 2013. In order to carry out R&M/LE works, Bathinda TPS Unit - 4 (110 MW), Barauni TPS Unit - 6&7 (2x110 MW), Muzaffarpur TPS Unit -2 (110 MW), Harduaganj TPS Unit -7 (110MW), Obra TPS Unit 7,10 & 11 (1x100+2x200 MW) and Patratu TPS Unit 9 (110 MW) were under shut down and works were under progress on the above mentioned thermal units.

Under Energy Efficiency Programme funded by KfW Bank/Germany, the DPRs for R&M/LE works for Unit-3 (210 MW) Nasik TPS of Mahagenco, Unit - 1, 2 & 3 (3x210 MW) Kolaghat TPS of WBPDC and Unit - 1, 2 & 3 (3x210MW) Bokaro 'B' TPS of DVC have been prepared. The DPRs in respect of U-3, Nasik TPS and U-1, 2&3 Kolaghat TPS have been accepted by the respective utilities.

Under Indo-German Energy Forum (IGEF), Phase-II activity, M/s Lahmeyer International (India) Ltd. has been appointed as a consultant and the contract was signed on 16.03.2012 between CEA and M/s Lahmeyer to provide the consultancy services for 'Development of Tendering Procedures and Model Contract document for R&M of Fossil Fuel Based Power Plants in India'. The project is funded by KfW Bank/Germany. M/s Lahmeyer has submitted the Final Model Feasibility Report, Detail Project Report, Model RLA & Energy Audit Report for R&M projects and draft Model tender document for selection R&M Contracts.

The World Bank is providing Technical Assistance to CEA of US \$ 1.1 million as a part of GEF grant under "Coal Fired Generation Rehabilitation Project -India" for addressing barriers to Energy Efficiency R&M in India. M/s. ABPS Infrastructure Advisory Services Ltd., is working as ISC (Implementation Support Consultant) to assist CEA for implementing the project under title 'Technical Assistance to CEA'. Few draft reports have been submitted by the consultant. Four other consultants have been procured under the project to carry out the technical studies.

We heartedly acknowledge and appreciate the co-operation of the Utilities/Organizations for providing the necessary and relevant information regarding the physical and financial progress of their R&M projects. We would be highly grateful for the suggestions/feedback for further improvement in the Quarterly Review Report.

नई दिल्ली
दिनांक : 18.10.2013

(मामचंद)
मुख्य अभियन्ता प्राभारी

Highlights

1. LE/ R&M Achievements during 11th Plan (2007 – 12)

Sl. No.	Particulars	State sector		Central sector		Total (State + Central)	
		No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
A)	LE works						
1.	Completed during 11 th Plan	10	1024	3	267	13	1291
B)	R&M works						
2.	Completed during 11 th Plan	20	4485	39	10370	59	14855
	TOTAL	30	5509	42	10637	72	16146

2. LE / R&M Programme during 12th Plan (2012 - 17)

Particulars	LE/R&M works identified during 12 th Plan No. of units & capacity (MW)		Total (State Sector + Central Sector)
	State Sector	Central Sector	
LE	38 (6820)	32 (5246)	70 (12066)
R&M	20 (4150)	45 (13151)	65 (17301)
Total	58 (10970)	77 (18397)	135 (29367)

3. Important Achievements of R&M and LE Projects during 12th Plan (upto 30.09.2013)

LE - 4 Units (436 MW)

R&M - 6 Units (960 MW)

Total (LE and R&M) - 10 Units (1396 MW)

4. External Co-operation for R&M/LE of TPS

The status of activities under external cooperation for R&M/LE of TPS is furnished below :-

(A) KfW funded Programme

(i) Preparation of DPRs for EE R&M by the consultant M/s Evonik Energy Services Pvt. Ltd., Germany.

a) Unit-3(210 MW) of Nasik TPS

The DPR was prepared by M/s. Evonik and the same has been accepted by Mahagenco/ MERC.

b) Unit 1,2 & 3 (3x210 MW) of Kolaghat TPS

The DPRs were prepared by M/s. Evonik and the same have been accepted by WBPDC.

c) Unit 1, 2 & 3(3x210 MW) of Bokaro 'B' TPS

The final DPRs have been prepared and sent to DVC in August 2013. The acceptance of DPRs by DVC is awaited.

(ii) Phase-II activity: Development of Tender Procedure and Model Contracts for R&M of Fossil Fuel Based Power Plants in India.

M/s Lahmeyer International (India) Ltd. has been appointed as a Consultant w.e.f. 16-03-2012 to provide the consultancy services for 'Development of Tendering Procedures and Model Contract document for R&M of Fossil Fuel Based Power Plants in India'. M/s Lahmeyer has submitted the Final Model Feasibility Report, Detail Project Report, Model RLA & Energy Audit Report for R&M projects and draft Model tender document for selection of R&M Contractors.

(B) 'Technical Assistance to CEA' funded by World Bank under the umbrella project "Coal Fired Generation Rehabilitation Project-India"

The consultants for carrying out the following studies under the above project have been appointed.

a) Study on Reduction of Barriers to R&M Interventions in TPS in India

M/s Mercados Energy Market India has been appointed as a Consultant for above study. Under this consultancy following draft final reports have been submitted :

- i. Study of International Best Practices in R&M
- ii. Risk identification & mitigation measures in R&M projects'
- iii. Guideline for early identification of potential technical surprises & way of addressing them'.
- iv. Identifying the Potential Reduction in GHG Emission and possible framework for monetizing the GHG reduction.

b) Study on Developing Markets for Implementation of R&M in TPS in India

M/s Mercados Energy Market India has also been appointed for the above study. Workshop / Road shows have been conducted on 14.6.2013 in New Delhi and on 4.7.2013 in Mumbai. Pre final report on the study has been submitted.

c) Review of Institutional Capacity and Capacity Strengthening Interventions in CEA

M/s KPMG has been appointed as a Consultant w.e.f. 16-07-2012 for the above consultancy services. Draft report on assessment of Institutional Capacity of CEA and Customer expectation survey have been submitted.

d) Review of Experience from Pilot R&M Interventions in TPS in India

M/s WAPCOS Ltd. has been appointed as a Consultant for the above study w.e.f. 23-07-2012. The report on Review of Procurement experience at R&M projects has been submitted.

(C) Japan-India co-operation for Pre- Primary study of Efficiency and Environmental improvement of Coal fired stations.

The 2nd Phase MOU between CEA and JCOAL has been signed on 11.06.2012 for carrying out detail diagnostic study for energy efficiency oriented R&M activities in three nos. of units at various thermal power plant viz Durgapur TPS of DVC, Unchahar & Badarpur TPS on NTPC. A kick-off meeting at the above stations were held in October 2012 and JCOAL team visited these stations during December, 2012 for studies. Final report for energy efficiency oriented R&M activities was submitted on 15th April, 2013. Annual Joint Meeting was held on 23.8.2013.

Quarterly Review Report on Renovation, Modernisation and Life Extension of Thermal Power Plants

1.0 Introduction

At the time of independence, the total installed capacity in the power sector was 1362 MW of which steam power plants contributed 756 MW. The installed generation capacity has since grown manifold. The total installed capacity as on 30.09.2013 was 228721.73 MW of which thermal power plants contributed 155968.99 MW (68.19%). The contribution of Coal, Gas and Diesel based thermal power plants of total installed capacity is 58.76%, 8.91% and 0.52% respectively.

Renovation & Modernization (R&M) is seen as a cost-effective option for additional generation from the existing thermal power stations and better asset management due to its low cost and short gestation period. Besides generation improvement and improvement in availability, other benefits achieved from R&M / LE include life extension, improved safety, reliability and environmental conditions.

Many of the thermal power plants are not operating to their full potential and large numbers of thermal units including 200/210 MW units are old and outlived their normal economical design life. The perspective R&M programme aims at extending their operating life further and also upgrade their performance through Energy Efficiency R&M (EE R&M).

2.0 Objective of R&M Programme

The main objective of Renovation & Modernisation (R&M) of thermal generating units is to make the operating units well equipped with modified / augmented with latest technology equipment and systems with a view to improve their performance in terms of output, reliability, availability, reduction in maintenance requirements, ease of maintenance and minimizing inefficiencies.

3.0 Objective of Life Extension Programme

The R&M programme is primarily aimed at generation sustenance and overcoming problems. The life extension (LE) programme on the other hand focuses on plant operation beyond their original design life after carrying out specific life assessment studies of critical components.

4.0 Renovation and Modernisation (R&M) and Life Extension Programme (LEP) from 7th Plan onwards till 11th Plan

R&M Programme in a structured manner was initiated in 1984 as a centrally sponsored programme during 7th Plan and the programme continued during the two Annual Plans 1990-91 & 1991-92. The momentum for undertaking R&M works continued during the 8th & 9th Plan. However, the same could, not be sustained during 10th Plan. The Plan wise details are given below:-

S. No.	Five Year Plan	Year	No. of TPS / No. of Units	Capacity (MW)	Additional Generation Achieved MU/ Annum*	Equivalent MW**
1	7 th Plan & 2 Annual Plans	85-86 to 89-90 & 90-91, 91-92	34 / 163	13570	10000	2000
2	8 th Plan (R&M) (LEP)	92-93 to 96-97	44 / 198 43/(194) 1 /(4)	20869 (20569) (300)	5085	763
3	9 th Plan (R&M) (LEP)	97-98 to 2001-02	37 / 152 29/ (127) 8/ (25)	18991 (17306) (1685)	14500	2200
4	10 th Plan (R&M) (LEP)	2002-03 to 2006-07	9/25 5/(14) 4/(11)	3445 (2460) (985)	2000	300
5	11 th Plan (R&M) (LEP)	2007-08 to 2011-12	21/72 15/(59) 6/(13)	16146 (14855) (1291)	5400	820

*Tentative figure.

** Equivalent MW has been worked out assuming PLF prevailing during that period.

5.0 National Perspective Plan

Based on the discussions held with Ministry of Power, various utilities, PFC and BHEL, CEA have prepared a “National Perspective Plan for Renovation & Modernisation and Life Extension and Uprating (LE&U) of thermal power stations upto the year 2016-17”. This document was released by Honorable Minister of Power on 14.12.2009 on the occasion of Energy Conservation day. The revised guidelines for R&M of coal based thermal power station were also issued.

6.0 LE / R&M Programme during 12th Plan (2012 - 17)

Break-up of revised tentative LE and R&M works of 29367 MW, on account of slippage from 11th Plan, to be taken up during 12th Plan in terms of Central/State sector-wise is furnished below (details are furnished at Appendix I):

S.No.	Particulars	LE/R&M works identified during 12 th Plan No. of units & capacity (MW)		Total (State Sector + Central Sector)
		State Sector	Central Sector	
1.	LE	38 (6820)	32 (5246)	70 (12066)
2.	R&M	20 (4150)	45 (13151)	65 (17301)
	Total	58 (10970)	77 (18397)	135 (29367)

6.1 Achievement of R&M/LE Programme during the 12th Plan upto 30th September 2013:

6.1.1 Achievement of LE Programme during the 12th Plan upto 30th September 2013:

State Sector (2 No. unit)

1. Bathinda TPS Unit – 3 (110 MW) - Synchronised on 05.08.2012.
2. Prichha TPS Unit- 2 (110MW) - Synchronised on 05.05.2013.
3. Muzaffarpur TPS Unit -1 (110 MW) - Synchronised on 05.7.2013

Central Sector (1 No. unit)

1. Kawas CCPP, GT-2 (106 MW) Synchronised on 21.01.2013

Sub total (LE) - 4 Unit (436 MW)

6.1.2 Achievement of R&M Programme during the 12th Plan up to 30th September 2013:

State Sector (5 Nos. of units)

1. DPL TPS Unit – 6 (110 MW) - Synchronised on 07.05.2012.
2. Patratu TPS Unit – 10 (110 MW) - Synchronised on 24.05.2012.
3. Anpara' A TPS Unit – 1 to 3 (3x210 MW) scheme completed on 31.3.2013.

Central Sector (1 no. unit)

1. Tanda TPS Unit – 2 (110 MW) – Synchronised on 15.09.2012

Sub total (R&M) - 6 Units (960 MW)

Total (LE and R&M) - 10 Units (1396 MW)

6.2 Status of R&M activities under Backward Region Grant Fund (BRGF) Scheme.

R&M-cum-LE works at Barauni and Muzaffarpur thermal power stations under BRGF of Planning Commission.

The Barauni TPS units 6&7 (2x110 MW) were commissioned during May, 1983 and March, 1985 respectively whereas Muzaffarpur TPS unit-1&2 (2x110 MW) were commissioned during March, 1985 and March, 1986 respectively.

Under RSVY now BRGF, Planning Commission in a meeting held on 10.05.2005 identified Barauni TPS, units 6&7 and Muzaffarpur TPS units 1&2 for carrying out Life Extension (LE) works. Subsequently, a five party agreement between the Government of India, Govt. of Bihar, BSEB, BHEL and NTPC was signed on 29.5.2006.

Planning Commission vide their letter dated 16.11.2009 approved the revised cost estimates of Rs. 1053 crores including consultancy charges under the Special Plan for Bihar for LE works of Barauni TPS (Unit 6&7) and Muzaffarpur TPS (Unit 1&2) as per details given below:

Barauni TPS Unit (6&7) : Rs. 554.16 crores
Muzaffarpur TPS (6&7) : Rs. 471.80 Crores
Consultancy charges to NTPC : Rs. 27.04 Crores
(for Barauni TPS only)

TOTAL : Rs. 1053.00 Crores

Details of Funds released by Planning Commission upto 31st March 2013 :

i) BHEL : Rs. 675.07 crores
ii) KBUNL : Rs. 150.00 crores
iii) NTPC : Rs. 18.026 crores
Total : Rs. 843.096 crores

Commencement of work and Completion Schedule :

Name of TPS	Unit No.	Zero Date	Contractual Completion Date	Anticipated Completion Date	Present physical status
Barauni TPS	7	15.11.2009	15.11.20011	15.03.2014	BHEL again assured the supply of turbine box up material by 31.10.2013 against the target date of 28.08.2013. This may impact the subsequent activities such as turbine box up and TG on barring gear. DM plant(civil- inside) work completed. DM plant (civil- outside) work, 60% completed. Completion is expected by the end of November, 2013. HP,IP and LP rotors received at site after repair. Bolier hydro test (drainable) done. Ash handling system (civil.works) to be completed by 15.02.2014, FOPH readiness by 31.12.2013 and completion of CHP is expected by 28.02.2014. Works in BOP areas are in progress. As per BHEL communication synchronization expected by March, 2014.
	6	15.11. 2009	15.06.2012	30.06.2014	Dismantling work completed. IP, HP, LP rotors are sent to BHEL Hyderabad for repair. Boiler erection works is in progress. Piling works in ESP, ID fan are started. New building work of Ash slurry pump house, foundation work of DM pant, fire pump house and dust suppression system are in progress. As per BHEL communication synchronization expected by June, 2014.
Muzaffarpur TPS	1	15.04. 2010	15.04.2012		Unit synchronised on 05.07.2013.
	2	15.04. 2010	15.08.2012	15.02.2014	Boiler pressure part work completed. 60% ducting completed. Air pre heater work started. Boiler hydro test in progress. LP, IP Rotors dispatched for repair. IP rotor expected by 20.10. 2013, all other material expected by 31.10.2013.

7.0 Future vision for Life Extension / R&M Programme

The coal based thermal plants are the backbone of Indian power sector. Presently, 200/210/250/500 MW thermal units contribute about 55% of total generation in the country. They are performing better in terms of their plant load factor and availability. However, a large number of such 200/210 MW units have or are near completion of their normal operating life and need modernization and life extension. There exists a potential for enhancing their rated capacity by 4-8% and efficiency by 8 to 10% in various 200/210 MW LMZ machines. Few such units have been taken up as pilot projects under Energy Efficient R&M (EE R&M) programme through funding support from World Bank and KfW, Germany. The approach to R&M and Life Extension & Up-rating (LE&U) has shifted primarily from “generation maximization” to “generation optimization” with efficiency improvement and possible up-rating.

So far, R&M activities were confined to old, small size units to sustain their operation, improve plant availability and extend their operating life. However, such units are highly inefficient and beset with various operational problems. It is aimed at to gradually decommission such units.

8.0 External Co-operation for R&M of TPS

To demonstrate the Energy Efficiency R&M programme in thermal power stations in India, a few pilot R&M projects have been financed by some external funding agencies such as KfW Development Bank-Germany, World Bank, European Union (EU) etc. The soft loans are provided by these external agencies for energy efficiency R&M programmes. Also, KfW & World Bank have provided some grant for technical assistance for preparation of Feasibility Reports/DPRs at selected thermal units and carrying out some R&M related studies. METI (Ministry of Economy, Trade and Industry), Japan and MOP, Govt. of India have agreed to extend their cooperation in sharing of technical expertise as well as in actual implementation of mutually agreed techno-economical R&M solutions. In addition to this, KfW has also financed the project “Development of Tender Procedure and Model Contract for the R&M of Fossil Fuel Based Thermal Power Plants in India”. The details of the above programme are as follows:-

8.1 Energy Efficiency R&M Programme funded by KfW Bank-Germany

Under Energy Efficiency R&M Programme, KfW Development Bank–Germany has provided a soft loan of Euro 90 million for implementation of Energy Efficiency R&M of two units of 210MW viz Nasik Unit- 3 of MAHAGENCO and one Unit of Kolaghat TPS of WBPDC. In addition to the above, KfW Bank has also provided a grant of Euro 1.3 million for preparation of feasibility reports/DPR to identify & finalize the scope of works for R&M/LE for the following seven units at three thermal power stations through a consultant:-

- i) Nasik TPS, U-3 (210MW) of Mahagenco
- ii) Kolaghat TPS, U-1, 2 & 3 (3x210MW) of WBPDC.
- iii) Bokaro ‘B’ TPS, U-1, 2 & 3 (3x210MW) of DVC.

M/s Evonik Energy Services GmbH, Germany was selected as Consultant through ICB route to prepare feasibility study / DPRs for the above seven (07) units. The implementation of R&M/LE works based on the Detailed Project Report (DPRs) would be taken up by the concerned utilities. The present status of the programme is as under:-

i) Nasik TPS

The final DPR for Unit-3 (210 MW) was prepared by the consultant, and same has been accepted by MAHAGENCO and MERC. As per the DPR the estimated cost of the R&M works is ₹ 481.46 crores (62 millions Euro). Govt. of Maharashtra has approved the 20 % equity of ₹ 96.29 crores for the project. Mahagenco have appointed M/s Steag Energy Services (India) on 14.06. 2012 as an Implementation Support

Consultant. The tender documents for procurement of executing agency for BTG package have been prepared. KfW has given their No- Objection for the commercial and technical specification for all the packages on 17.08.2012.

ii) Kolaghat TPS

The DPRs for Unit-1,2& 3 (3x210 MW) of Kolaghat TPS,WBPDCL were prepared by the consultant and the same have been accepted by WBPDCL in September 2011. As per the DPR the estimated cost of the R&M works for unit-3 is ₹ 567 crores (90 million Euro). WBPDCL has requested KfW for enhancement of the fund to meet capital expenditure.

iii) Bokaro ‘B’ TPS

The revised DPRs for Unit-1, 2& 3 (3x210 MW) of Bokaro ‘B’ TPS were prepared by the consultant and sent to DVC for their comments/ acceptance on 21.03.2012. Based on the comments of DVC, the DPRs have been revised by STEAG and re-submitted the DPRs in August 2013. The acceptance of DVC is awaited.

8.2 Development of the Tender Procedures and Model Contract for the R&M of Fossil Fuel Based Power Plants in India.” Funded by KfW Development Bank– Germany.

The Sub-Group-I on “ Efficiency Enhancement in Fossil Based Power Plants” constituted under the Indo-German Energy Forum, in its first meeting held on 12.03.2008 identified the Development of Standard Documents for R&M Projects among the three other issues. The development of Standard Documents was envisaged to be done in two phases as under.

Phase-I Task

The objective of Phase-I activity is an assessment of tendering procedures currently being followed by public utilities in India and a review of documents used for standard R&M projects as well as the documents which have already been developed for projects financed particularly by World Bank. The Phase-I Activity was carried out by the consultant-M/s. Evonik Energy Services India appointed and funded by GIZ. M/s. Evonik Energy Services India submitted the report on Phase-I activity in September 2009.

Phase-II Task

The main objective of Phase-II activity is the preparation of the model documents/templates for R&M Projects in consultation with task force, power utilities & financing agencies. It is intended to apply the documents for the Energy Efficiency Programme financed by KfW.

A Task Force on “Development of Tender Procedures and Model Contracts for the Renovation & Modernization (R&M) of Fossil Fuel Based Power Plants in India” under the chairmanship of Member (Thermal), CEA has been constituted vide MoP letter no. 5/33/2009-S.Th. dated 29/10/2009 comprising the members from MOP,CEA, NTPC and various power utilities to carry out the Phase-II activity.

The first Meeting of Task Force was held on 20th November 2009 in CEA, New Delhi to discuss the report of Phase-I activity and further approach & methodology for development of the tender procedures and model contract for the R&M of fossil fuel based power plants under Phase-II activity. It was decided to carry out the activity through a consultant with KfW funding. The MoP nominated CEA as Project Implementing Agency in December 2009 to carry out the Phase-II Activity. M/s Lahmeyer International India Pvt. Ltd has been appointed as a consultant w.e.f 16-03-2012 for carrying out Phase -II activity.

The fifth meeting of the Task Force on Developing of Tendering Procedure and Model contract for the R&M of fossil Fuel Based Power Plant in India was held in CEA on 14.5.2013. Following Draft reports were discussed in the meeting.

1. Model Document on Feasibility Report
2. Model Document on Detailed Project Report,
3. Model Document on RLA/CA Report
4. Model Document on Energy Audit Report

Based on the comments and discussions all the above mentioned reports have been modified and submitted by M/s Lahmayer by the end of July, 2013. The documents are under finalization .

8.3 “Coal-Fired Generation Rehabilitation Project-India” funded by World Bank.

The World Bank has financed the “Coal-Fired Generation Rehabilitation Project-India” for demonstrating Energy Efficiency Rehabilitation & Modernization (EE R&M) at coal fired generating units through rehabilitation of 640 MW of capacity across three States-West Bengal, Haryana and Maharashtra. The above project has two components:-

Component-1. Energy Efficiency R&M at Pilot Projects

This component would fund implementation of Energy Efficient R&M of 640 MW capacity comprising Bandel TPS Unit-5(210 MW) of WBPDC, Koradi TPS Unit-6(210 MW) of Mahagenco and Panipat TPS Unit-3&4 (2x110 MW) of HPGCL. The World Bank has earmarked US \$ 180 million of IBRD loan and US \$ 37.9 million of GEF grants for the Component-1.

Component-2. Technical Assistance to CEA and Utilities

The Technical Assistance component of the project is aimed at providing support in implementation of EE R&M pilots, developing a pipeline of EE R&M interventions, addressing barriers to EE R&M projects and strengthening institutional capacities of implementing agencies for improved operation and maintenance practices. The World Bank has earmarked US \$ 7.5 million GEF grant for the Component-2.

8.3.1 World Bank funded Energy Efficiency Pilot R&M Projects

i) Bandel TPS, (Unit-5,210 MW)

Total cost of the project is around Rs. 652 crores(based on the bidding). Fund allocation for the Bandel TPS is around US \$ 59 million (Loan) and Grant US \$ 12.45 million. Cumulative expenditure incurred is Rs. 54.62 Crore. M/s Development Consultant Pvt. Ltd.(DCPL) has been appointed as a implementation support / quality assurance consultant, the contract was signed on 10-04-2012 for a total contract price Rs. 5.25 Cr

Status of Physical Progress:

➤ BTG Package:

Contract for BTG package has been awarded to M/s Doosan Heavy Industries & Construction Co. Ltd and their associate on 29-02-2012 at a total cost of Euro 37,584,887 and ₹ 29,09,782,849. Effective date of the contract is 02-04-2012. Basic engineering works have been started for boiler & turbine activities. L-2 schedule has been prepared and approved by WBPDC. Supply of plant & machinery has been started in Sept., 2013. The shut down of the unit for execution of the R&M works is expected on 05.11.2013,. Expected date of completion of BTG package is June, 2014.

➤ **CHP Package:**

The contract with M/s Vinar Systems Pvt. Ltd. has been signed on 3rd January, 2013. Overall cumulative progress for design engineering and procure till July, 2013 is 30.93%.

➤ **AHP Package:**

Contract is signed on 29th April, 2013 with M/s. MBPL. Project execution Plan, Master MQP list & L-2 schedule has been submitted. Design engineering and procurement is in progress.

➤ **Electrical Package:**

The contract has been signed with M/s Alstom T&D India Ltd. on 28-12-2012. Overall cumulative progress for design engineering and procurement is achieved till July, 2013 is 15.63%

ii) **Koradi TPS, (Unit-6,210 MW)**

Total cost of the project is ₹ 486 Cr. World Bank finance of around US \$ 59 million (Loan) and Grant US \$ 12.45 million is available for the unit Unit-6 of Koradi TPS. M/s Evonik Energy Services (Project design consultant) prepared the DPR. The same has been approved and accepted by MSPGCL Board on 26-06-2009. In-principle approval of MERC for capital expenditure had been received on 24-05-2010. The R&M project consists of four major packages BTG, Electrical, BOP & CHP.

Status of Physical Progress:

➤ **BTG Package**

MSPGCL has issued LOI on M/s BHEL on 29th May, 2013. The expected date completion of the project is February, 2016.

➤ **Electrical Package**

The Letter of Award issued to M/s ABB Ltd on March 19, 2012 and final contract was signed on May 25, 2012 for a contract price of ₹ 802 lakhs. Advance Payment of ₹ 80 Lakhs has been made to M/s ABB. Further, the expected date of completion of the contract has been extended to February, 2016.

➤ **BOP Package**

Letter of Award issued to M/s Tecpro Systems Ltd. on July 16, 2012 for a contract price of ₹ 2908 lakhs . The final contract was signed on August 10, 2012. Further, the expected date of completion of the contract has been extended to February, 2016.

iii) **Panipat TPS (Unit-3&4, 2x110 MW)**

The unit 3 &4 of Panipat TPS was initially identified for R&M under World Bank Programme and a DPR was prepared. In the financial sensitivity analysis of change in station heat rate R&M of these units were not financially viable. Therefore, HPGCL has requested World Bank to consider foreclosure of the Loan agreement.

8.3.2 Technical Assistance to CEA

The World Bank is providing technical assistance of US \$ 1.1 million as a part of GEF grant to CEA under “Coal Fired Generation Rehabilitation Project-India” for addressing the barriers to Energy Efficient R&M of coal fired generating units in India. The project is being implemented by CEA through appointment of consultants for carrying out following four studies:

- a) Review of institutional capacity and capacity strengthening interventions at CEA.
- b) Study on reduction of barriers to R&M interventions in thermal power stations in India.
- c) Study on developing markets for implementation of R&M in thermal power stations in India.
- d) Review of experience from Pilot R&M interventions in thermal power stations in India.

Various consultants for carrying out the studies have been appointed and the present status is as under:

Sl. No.	Consultancy services	Status as on (30.09.2013)
1.	Implementation Support Consultancy (ISC)	M/s ABPS Infrastructure was appointed as ISC on 28.10.2010 for assisting CEA in implementing the project.
2.	Study on Reduction of Barriers to R&M intervention in thermal power station in India.	M/s Mercados Energy Market India has been appointed as a consultant w.e.f. 24.04.2012. M/s Mercados visited various power utilities/entities for stake holder consultation during July-September, 2012 and submitted two draft guidelines i.e. ‘Risk identification & mitigation measures in R&M projects’ and ‘Early identification of potential technical surprises & way of addressing them’. The Pre-final Report on Study of International Best Practices in R&M, Risk identification & mitigation measures in R&M projects, Early identification of potential technical surprises & way of addressing them’ and Draft report on study of Identifying the Potential Reduction in GHG Emission and possible framework for monetizing the GHG reduction.
3.	Study on Developing Markets for implementation of R&M in thermal power stations in India	M/s Mercados Energy Market India has been appointed as a consultant w.e.f. 14.05.2012. They have submitted the draft report on “Estimation of R&M potential in India during XII and XIII Five Year Plan” in January 2013. After discussion with Task Force on 15.4.2013 M/s Mercados have submitted draft report on study on Developing Market of Implementation of R&M scheme in thermal power stations in India on 6 th March, 2013. Workshops were organized by CEA and M/s Mercados on 14.6.2013 in New Delhi and on 4 th July 2013 in Mumbai for open discussion with the various stakeholders.

4.	Review of Experience from Pilot R&M projects	M/s WAPCOS Ltd. has been has been appointed as a consultant w.e.f. 23-07-2012. M/s WAPCOS submitted inception report on 06-09-2012 and started consultation with utilities for collection of inputs on procurement experience in R&M projects. M/s WAPCOS submitted the draft report on procurement experience in May 2013.
5.	Review of Institutional Capacity and capacity strengthening interventions in CEA	M/s KPMG has been appointed as consultant w.e.f. 16-07-2012. M/s KPMG submitted inception report 30-08-2012. A workshop has been held in CEA in October'12 to have discussions with officers of CEA. They are carrying out the stakeholder consultation to prepare a report on 'Customer Expectation Survey'. M/s KPMG have submitted draft report on As – Is Assesment and customer expectation survey in May 2013. Report is under review and finalisation

8.4 Japan-India co-operation for Study on Efficiency and Environmental Improvement of Coal Fired Stations

A MOU between Central Electricity Authority and Japan Coal Energy Centre (JCOAL) for preliminary study of Efficiency and Environment improvement study in coal fired power plants was signed on 30.4.2010 to carryout necessary diagnostic activities in few candidate coal-fired power plants pertaining to Energy Efficient Renovation & Modernisation works and finding out measures to overcome barriers for promoting R&M, towards carrying out efficiency and environmental improvement of coal-fired power plants in India. Accordingly studies were taken up in Ukai and Wanakbori TPS (GSECL), Ramagundem STPS (NTPC) and Vijaywada TPS (APGENCO) for pre – primary studies. After Pre-Primary Studies, JCOAL finalized 3 units viz., Vijaywada TPS Unit-1 (210MW) of APGENCO, Wanakbori TPS Unit-1 (200 MW) of GSECL and Kahelgaon STPS Unit-2 (210 MW) of NTPC for full-fledged diagnosis. The final report had been submitted in December 2012.

The 2nd Phase MOU between CEA and JCOAL has been signed on 11.06.2012 for carrying out detail diagnostic study for energy efficiency oriented R&M activities in three nos. of units.

For selection of 3 nos. candidate units proposals were sent to various power utilities. Based on confirmation from DVC and NTPC, Durgapur TPS unit no.4 (210 MW LMZ Unit) and one unit each from Badarpur TPS and Unchahar TPS were selected for studies during the 2nd phase. Kick-off meeting in these station were held in October'12 and JCOAL team visited these stations during December, 2012. A workshop was held on 27.11.2012 on “Project on Efficiency and Environmental Improvement of Coal Fired Power Stations – Towards sustainable, stable and low carbon supply of electricity. The final report for carrying out study for energy efficiency oriented R&M activities was submitted on 15th April, 2013.

The Annual Joint Meeting among JCOAL, CEA and MOP was held on 23rd August 2013 (F/N). Meeting of Electricity Working Group of the Japan India Energy Dialogue was held on 23.8.2013 (A/N) was coordinated by TRM Division CEA.

8.5 Workshop and Training programme on Renovation & Modernisation and Operational Practices for the Indian Thermal Power Sector

A Contract has been signed between European Commission and STEAG Energy Services (India) Pvt. Ltd. for implementation of the project and the kick-off meeting has been held on 19th December, 2012 in Brussels. Ministry of Power has designated CEA as the Nodal Agency for this assignment.

As per the Contract, STEAG Energy Services (India) Pvt. Ltd. has to organize two workshops on the following topics:

- (i) A Road Map for R & M and O & M of existing Indian coal Fired Power Plants
- (ii) Training program to enhance the capacity of the Indian Thermal Power Sector managers to plan and carry out R&M in a timely and efficient manner.

The first workshop concerning a Road Map for R & M and O & M of existing Indian coal Fired Power Plants was held on 10th May 2013. The representatives from various utilities, consultants and other stakeholders participated in the Workshop. The Base Paper prepared by M/s Steag Energy Services (India) with the approval of CEA and EC was discussed in details and the recommendations were finalized.

A study tour on R & M to Europe is also planned to be organized.

Details of Units where LE/R&M works to be taken up during the 12th Plan
STATE SECTOR (LE Works)

S.N.	State	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present status
1	U.P.	Obra	10	1977	200	BHEL is executing agency. Unit # 10 & 11 taken under S/d since 22.03.2012. The revised scope of supply and services for turbine for name plate rating i.e. 200 MW in place of 216 MW has been finalised at revised total contract price for unit 10 to 13 at 1145.76 Crore. The revised zero date is 25.3.2013. The completion of first unit in 24 months and subsequent units shall be completed with a time interval of 3 month each.
2	U.P.	Obra	11	1977	200	
3	U.P.	Obra	12	1981	200	
4	U.P.	Obra	13	1982	200	
5	U.P.	Harduaganj	7	1978	110	BHEL is executing agency. Unit taken under S/d since 05.03.2011. Expected to be synchronised by July 2013. UPRVUNL apprehended that the completion may be delayed further.
6	U.P.	Parichha	1	1984	110	Order Placed on BHEL for LE of unit 2 and BOP of both units 1&2. Work in progress in BOP area LE work in unit-1 is dropped.
7	U.P.	Parichha	2	1985	110	Unit synchronised on 5.5.2013.
8	Punjab	Bathinda	3	1978	110	The unit taken under s/d on 14.01.2010, and synchronised on 05.8.2012.
9	Punjab	Bathinda	4	1979	110	BHEL is executing agency. Unit taken under s/d on 05.11.2012., 90% erection work of boiler, 40% of work of turbine and its auxiliaries, 55% C&I works, 73% electrical & BOP works and 94% civil works completed. As per latest status given by BHEL, Unit-4 expected to be synchronized by end of Oct' 2013.
10	Haryana	Panipat	3	1985	110	Was identified for World Bank funded project. As per DPR, Energy Efficiency R&M is not financially viable, hence no life extension works are to be taken up.
11	Haryana	Panipat	4	1985	110	
12	Maharashtra	Nashik	3	1979	210	Taken up under KfW funded project. .DPR approved by MSPGCL / MERC. Publishing of NIT is in process.
13	Maharashtra	Nashik	4	1980	210	To be decided inline with Nashik U#3. Consultant for DPR preparation has been appointed.
14	Maharashtra	Koradi	5	1978	200	2 nd stage Bid evaluation is in progress.
15	Maharashtra	Koradi	6	1982	210	WB funded project. DPR approved by MSPGCL/MERC. Electrical pkg. is awarded to M/s ABB. Order for BTG package placed on B HEL in May 2013.
16	Maharashtra	Bhusawal	2	1979	210	WB funded pipeline project. RLA studies

17	Maharashtra	Bhusawal	3	1982	210	completed. DPR yet to be prepared.
18	Maharashtra	Chandrapur	1	1983	210	WB funded pipeline project. RLA studies completed. DPR prepared. Mahagenco is to finalise scope of work.
19	Maharashtra	Chandrapur	2	1984	210	
20	Maharashtra	Parli	3	1980	210	WB funded pipeline project. RLA studies completed, DFR/DPR is awaited.
21	Chhattisgarh	Korba (West)	1	1983	210	RLA studies done by M/s Evonik. Preparation of tender documents is in process.
22	Chhattisgarh	Korba (West)	2	1984	210	
23	M.P.	Satpura	6	1979	200	DPR prepared by NTPC at an estimated cost of Rs. 2100Cr for units 6 to 9. Utility is exploring the possibility of carrying out LE works through LROT. However, need based R&M works are planned during AOH.
24	M.P.	Satpura	7	1979	210	
25	Tamilnadu	Tuticorin	1	1979	210	Scope of work finalised at estimated cost of Rs. 129 Cr. Work other than main plant is in progress
26	Tamilnadu	Tuticorin	2	1980	210	Scope of work finalised at estimated cost of Rs. 150 Cr. Work other than main plant is in progress
27	A.P.	Dr. N.T. TPS (Vijaywada)	1	1979	210	77 activities were taken up at an estimated cost of Rs. 193.83 Cr. Anticipated completion by 31.12.2013.
28	A.P.	Dr. N.T. TPS (Vijaywada)	2	1980	210	
29	Karnataka	Raichur	1	1985	210	Need based R&M works planned
30	Karnataka	Raichur	2	1986	210	Need based R&M works planned
31	Bihar	Barauni	6	1983	110	LOA awarded on 15.02.2010. Unit under s/d since 17.03.2012. As per schedule furnished by BHEL unit may be synchronised by June' 2014.
32	Bihar	Barauni	7	1985	110	R&M in progress. Boiler erection in progress. ESP erection works is in progress. BHEL furnished revised schedule for synchronisation as March, 2014.
33	Bihar	Muzaffarpur	1	1985	110	Unit was under s/d since 6.10.2003. Unit Synchronised on 5th of July, 2013.
34	Bihar	Muzaffarpur	2	1986	110	S/d taken on 29.03.2012. Dismantling work completed, BHEL confirmed revised schedule for Synchronisation by 15 th Feb, 2014.
35	W.Bengal	Kolaghat	1	1990	210	DPR prepared and accepted by WBPDC. Concurrence for funding from KfW is under process.
36	W.Bengal	Kolaghat	2	1985	210	To be decided inline with Kolaghat U#1
37	W.Bengal	Kolaghat	3	1984	210	To be decided inline with Kolaghat U#1
38	W.Bengal	Bandel	5	1982	210	World Bank funded project. Contract for BTG pkg. awarded to M/s DHIC and signed on 29.2.2012. Expected completion Sept 2014.
Sub Total State Sector (LE)			38		6820	

STATE SECTOR (R&M Programme)

S.N.	State	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present status
1	U.P.	Obra	7	1974	100	S/d since 01.07.2010. Dismantling works completed, erection started since 3.6.2011. Expected synchronisation is December 2013.
2	U.P.	Anpara	1	1986	210	Estimated cost of R&M is Rs. 68.96 Cr. Financed by PFC and UPRVUNL. The scheme completed in March 2013.
3	U.P.	Anpara	2	1986	210	
4	U.P.	Anpara	3	1988	210	
5	U.P.	Anpara'B	4	1993	500	R&M works is being executed by M/s BHEL & M/s MITSUI, Japan. The total cost of scheme is Rs. 691.97 crore out of which loan agreement to Rs. 553.576 Crore has been finalised by PFC and remaining Rs. 138.394 Crore from internal resources. Work to be carried out during Annual / Capital S/d period. Expected completion by March., 2015.
6	U.P.	Anpara'B	5	1994	500	
7	Punjab	Ropar	1	1984	210	Utility decided to do need based R&M at estimated expenditure of Rs. 55 Cr.
8	Punjab	Ropar	2	1985	210	
9	Punjab	Ropar	5	1992	210	Utility decided to do need based R&M at estimated expenditure of Rs. 65 Cr.
10	Punjab	Ropar	6	2001	210	
11	Haryana	Panipat	5	1993	210	RLA studies done. Scope of work finalised.
12	Gujarat	Wanakbori	1	1982	210	Utility decided to do need based R&M. Works for upgrading of C&I system has already been awarded.
13	Gujarat	Wanakbori	2	1983	210	
14	Gujarat	Ukai	3	1979	200	Utility decided to do need based R&M
15	Gujarat	Ukai	4	1979	200	Utility decided to do need based R&M
16	Rajasthan	Kota	1	1983	110	RRVUNL has identified 10 nos. schemes at an approx expenditure of Rs. 285 Cr. and in principal approval has been sought from regulators.
17	Rajasthan	Kota	2	1983	110	
18	Jharkhand	Patratu	9	1984	110	Unit was under s/d from 5.8.2006 due to fire incident. works is under progress. Synchronisation is expected by March , 2014 as confirmed by executing agency BHEL
19	Jharkhand	Patratu	10	1986	110	Unit was under s/d from 5.8.2006 due to fire incident. Synchronised on 24.05.2012.
20	W. Bengal	DPL	6	1985	110	Synchronised on 07. 05. 2012 after R&M.
Sub Total State Sector (R&M)			20		4150	
Total State sector (LE+R&M)			58		10970	

**CENTRAL SECTOR (LE Programme)
Coal Based**

Sl. No.	Utility	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present Status
1	DVC	Bokaro 'B'	1	1986	210	Considered under KfW funded project. DPRs were prepared by M/s Evonik. Acceptance from DVC is awaited.
2	DVC	Bokaro 'B'	2	1990	210	
3	DVC	Bokaro 'B'	3	1993	210	
4	DVC	Durgapur	4	1982	210	
5	NTPC	Badarpur	4	1978	210	Major work in Switchyard completed. ESP renovation in progress. Expected completion in FY 2013-14. For main plant package re-tendered due to poor response from Vendors.
6	NTPC	Badarpur	5	1981	210	
7	NTPC	Singrauli STPS	1	1986	200	Investment approval obtained.
8	NTPC	Singrauli STPS	2	1987	200	
9	NTPC	Singrauli STPS	3	1983	200	
10	NTPC	Singrauli STPS	4	1983	200	
11	NTPC	Singrauli STPS	5	1984	200	
12	NTPC	Korba STPS	1	1983	200	Investment approval obtained. Schemes are under tendering process.
13	NTPC	Korba STPS	2	1983	200	
14	NTPC	Korba STPS	3	1984	200	
15	NTPC	Ramagundam STPS	1	1984	200	Investment approval obtained. Tender for C&I and TG packages floated in March and April 2013 respectively.
16	NTPC	Ramagundam STPS	2	1984	200	
17	NTPC	Ramagundam STPS	3	1984	200	
Sub total C. S (LE Coal based)			17		3460	

Central Sector LE (Gas based)

S.N.	State	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present status
1		Dadri GT	GT-1	1991	131	Under tendering stage, all necessary approvals are in place. Bids are under evaluation.,
2		Dadri GT	GT-2	1991	131	
3		Dadri GT	GT-3	1991	131	
4		Dadri GT	GT-4	1991	131	
5		Auraiya GT	GT-1	1989	111.19	Order is placed on 27 th Nov.'2012 for gas turbines and C&I package of full plant. To be completed in 29 months.
6		Auraiya GT	GT-2	1989	111.19	
7		Auraiya GT	GT-3	1989	111.19	
8		Auraiya GT	GT-4	1989	111.19	
9		Kawas GT	GT-1A	1992	106	Order for GT renovation have been placed on M/s GE on 23/03/12. Works on unit-2 has been completed on 21.01.2013 and the rest are to be completed by 2013-14.
10		Kawas GT	GT-1B	1992	106	
11		Kawas GT	GT-2A	1992	106	
12		Kawas GT	GT-2B	1992	106	
13		Gandhar GT	GT-1	1994	131	Order for GT renovation have been placed on M/s Alstom on 16.05.2012. To be completed by 2013-14.
14		Gandhar GT	GT-2	1994	131	
15		Gandhar GT	GT-3	1994	131	
Sub Total (LE Gas based)			15		1785.8	

Sl. No.	Utility	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present status
1	NTPC	Singrauli STPS	6	1986	500	Investment approval accorded. Scheme under tendering process
2	NTPC	Singrauli STPS	7	1987	500	
3	NTPC	Korba STPS	4	1987	500	Investment approval accorded. Scheme under tendering process
4	NTPC	Korba STPS	5	1988	500	
5	NTPC	Korba STPS	6	1988	500	
6	NTPC	Ramagundam STPS	4	1988	500	Investment approval accorded. Scheme under tendering process
7	NTPC	Ramagundam STPS	5	1989	500	
8	NTPC	Ramagundam STPS	6	1989	500	
9	NTPC	Farakka Stage-II	4	1992	500	Under tendering stage, all necessary approvals are in place
10	NTPC	Farakka Stage-II	5	1994	500	
11	NTPC	Tanda	2	1989	110	Synchronised on 15.09 2012
12	NTPC	Unchahar	1	1988	210	Scheme finalised. Investment approval accorded. Schemes under tendering stage.
13	NTPC	Unchahar	2	1989	210	
14	NTPC	Unchahar	3	1999	210	
15	NTPC	Unchahar	4	1999	210	
16	NTPC	Vindhyachal	1	1987	210	Scheme finalised. Investment approval accorded. Schemes under tendering stage.
17	NTPC	Vindhyachal	2	1988	210	
18	NTPC	Vindhyachal	3	1989	210	
19	NTPC	Vindhyachal	4	1989	210	
20	NTPC	Vindhyachal	5	1990	210	
21	NTPC	Vindhyachal	6	1991	210	
22	NTPC	Vindhyachal	7	1999	500	
23	NTPC	Vindhyachal	8	2000	500	
24	NTPC	Simhadri	1	2002	500	Scheme finalised. Investment approval accorded. Schemes under tendering stage.
25	NTPC	Simhadri	2	2002	500	
26	NTPC	Talchar STPS	1	1995	500	Under tendering stage, all necessary approvals are in place.
27	NTPC	Talchar STPS	2	1996	500	
28	NTPC	Dadri	1	1991	210	Under tendering stage, all necessary approvals are in place.
29	NTPC	Dadri	2	1992	210	
30	NTPC	Dadri	3	1993	210	
31	NTPC	Dadri	4	1994	210	
32	NTPC	Rihand STPS Ph III	1	1988	500	Scheme finalised. Investment approval accorded. Schemes under tendering stage.
33	NTPC	Rihand STPS Ph III	2	1989	500	
34	NTPC	Kahalgaoon	1	1992	210	Under tendering stage, all necessary approvals are in place.
35	NTPC	Kahalgaoon	2	1994	210	
36	NTPC	Kahalgaoon	3	1995	210	
37	NTPC	Kahalgaoon	4	1996	210	
Sub total C.S. (R&M)			37		12890	
Sub total C.S. Coal Based (LE + R&M)			54		16350	

CENTRAL SECTOR R&M (Gas Based)

CENTRAL SECTOR R&M (Gas Based)						
1	NEEPCO	Kathalguri CCGT	GT-1	1995	33.50	The scope of work finalised. The proposals are in advance stage of approval for ₹ 102.25 Cr., completion is expected by March, 2014.
2		Kathalguri CCGT	GT-2	1995	33.50	
3		Kathalguri CCGT	GT-3	1995	33.50	For upgradation of control system of unit-4, orders for ₹ 4.14 Cr. Placed, materials received at site, works completed.
4		Kathalguri CCGT	GT-4	1995	33.50	
5		Kathalguri CCGT	GT-5	1996	33.50	
6		Kathalguri CCGT	GT-6	1996	33.50	
7		Kathalguri CCGT	ST-1	1998	30.00	
8		Kathalguri CCGT	ST-2	1998	30.00	
Sub Total Gas (R&M)			8		261	

Sub total Gas in C.S. (LE + R& M) 23 2046.8

Total R&M + LE 135 29367

Northern Region

(Unit wise Broad Status of LE works)

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Supply started
1	Name of Power Station	OBRA	i) Boiler : 100%Replacement damaged ceiling structure, Refractory and thermal insulation- Replacement 180 nos. HP and LP valves, 200 nos. route valves, replacement/repair of fuel oil system valves, replacement of 8 nos. spray control valves and piping for Desuper heater in super heater and reheater, replacement of 4 nos. control valves, 2 nos. drum safety valves, 2 nos. reheater safety valves, all other safety valves superheater will be serviced. 100%Replacement of valves in PRDS system. .Skin Casing, Hangers & supports of Main steam pipe. 100% alignment of water walls. Correction of Buck stays, guide channels, vertical channel, corner attachment from 8M to 48M, replacement of all peep holes & man holes. 100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, Economizer. O/H of Boiler Drum & Internals, 100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system. Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system. O/H & repair of damaged parts of FD fans. 100% Replacement of ID fans with 10% enhanced capacity. Cold air ducts, Hot air ducts, Flue gas ducts, Compensators in cold air ducts, Compensators in cold air ducts, Sampling coolers, Dampers and gates, Scanner air fan, Suit blowing system, wall blowers. O/H & Replacement of damaged parts of P.A. Fans., 100% Replacement of Raw coal scrapper feeder (2 Nos.), Wind box & Coal burners of coal burners & Coal dust pipes and bends with ceramic lining of Coal Milling and firing system. Complete O/H of Oil firing system: Replacement of Control & Instrumentation: Boiler Controls, FSSS (BMS), Secondary Air Damper Control Panels (SADC), Soot Blower Control Panels (SBC Panels), Cables between consoles and DCS cabinets, Interconnecting cables between DCS cabinets, Auto Control Loops for Boiler (maxDNA based).
2	Unit No. & capacity	U-10 (200 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	01/1979	
B. RLA Study / Consultancy			
Description		Boiler	TG.
Estimated Cost (Rs in Cr)		1 crore for RLA of the unit has been covered along with LE works	
Executing Agency		BHEL	
Expected/Actual start of work			
Completion date			
Actual Expenditure (Rs in Cr)			
			ii) TG : HP Turbine:: Fully bladed new rotor,- New blading set complete stages, Complete machined new shaft, Inner casing including guide blades sealing arrangement, safety governor, fasteners, Complete new modernized outer casing IP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms LP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Complete set of diaphragms. Inner casing, materials for modernisation of LP outer casing, coupling, sealing arrangement, fasteners, Rotor and diaphragms lifting device for units (9 to 13). Jacking oil pump (1 set). Electro hydraulic governing system (1 set). Auxiliary equipment: Ejectors, Condenser tubes 100% replacement Generator(1 set). : Stator winding bars and winding, Supply of end packets and shunts for stator and assembly, Generator C&I, Gas analyzer cabinet, Generator instrumentation cabinet, Conductivity instruments, Moisture measurement system, Group cables for generator C&I area for connection between junction boxes and cabinets, between cabinets, between C&I cabinets and UCB. TG Auxiliaries: Gland steam condenser: Supply of cupronickel tube bundles considered Supply of: Main oil cooler, L.P. heater 1-4 of cupronickel tube bundles, Deaerator, Pipes and supports cooling water line of MOC, Valves upto 65 mm, insulation and cladding, Spares for D/C, A/C oil pumps, S.O.P, Condensate Extraction water pumps, Bearing gear spares, Boiler Feed Pump: BFP cartridge (1 No), Hydraulic coupling R16K (2 Nos), RC valve (3 Nos), Connecting coupling strainer & warm up valve, (3 Nos), Drip pump valves & fittings (2 sets), Warm up valve & safety valves for BFP (1set). O/H of Booster Pump & H.P.Heters: Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area

C	R&M/ LE Works		iii) BOP : Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW. Station C&I Equipment, SWAS system, Flue gas analysers, Instrumentation cables for auto loop & measurement loops, Max DNA based DCS panels for measurement loops, Back-up control desk (for auto control & measurement loops) for critical operation for safe shut down of unit), Alarm system excepting for generator area., Sequence of event recording SOE (integral part of DCS), Interlocks & protection for fans & BFP (maxDNA based system), Static excitation system: Thruster cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares.
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date	20.6.2006	
4	Expected/Actual date of Start of work	25.03.2013 (A) After revised scope of work	
5	Expected/Actual date of Completion of work		
6	Estimated Cost (Rs in Cr)	Rs 1702.14 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 1136.81 Cr (On unit 9-13)	

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Work under progress
1	Name of Power Station	OBRA	i) Boiler : 100%Replacement damaged ceiling structure, Refractory and thermal insulation- Replacement 180 nos. HP and LP valves, 200 nos. route valves, replacement/repair of fuel oil system valves, replacement of 8 nos. spray control valves and piping for Desuper heater in super heater and reheater, replacement of 4 nos. control valves, 2 nos. drum safety valves, 2 nos. reheater safety valves, all other safety valves superheater will be serviced. 100%Replacement of valves in PRDS system. .Skin Casing, Hangers & supports of Main steam pipe. 100% alignment of water walls. Correction of Buck stays, guide channels, vertical channel, corner attachment from 8M to 48M, replacement of all peep holes & man holes. 100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, Economizer. O/H of Boiler Drum & Internals, 100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system. Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system. O/H & repair of damaged parts of FD fans. 100% Replacement of ID fans with 10% enhanced capacity. Cold air ducts, Hot air ducts, Flue gas ducts, Compensators in cold air ducts, Compensators in cold air ducts, Sampling coolers, Dampers and gates, Scanner air fan, Suit blowing system, wall blowers. O/H & Replacement of damaged parts of P.A. Fans., 100% Replacement of Raw coal scrapper feeder (2 Nos.), Wind box & Coal burners of coal burners & Coal dust pipes and bends with ceramic lining of Coal Milling and firing system. Complete O/H of Oil firing system: Replacement of Control & Instrumentation: Boiler Controls, FSSS (BMS), Secondary Air Damper Control Panels (SADC), Soot Blower Control Panels (SBC Panels), Cables between consoles and DCS cabinets, Interconnecting cables between DCS cabinets, Auto Control Loops for Boiler (maxDNA based).
2	Unit No. & capacity	U-11 (200 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	01/1979	
B. RLA Study / Consultancy			
	Description	Boiler	TG.
	Estimated Cost (Rs in Cr)	1 crore for RLA of the unit has been covered along LE	
	Executing Agency	BHEL	BHEL
	Expected/ Actual start of work		
	Completion date		
	Actual Expenditure (Rs in Cr)		
			ii) TG : TG HP Turbine:: Fully bladed new rotor,- New blading set complete stages, Complete machined new shaft, Inner casing including guide blades sealing arrangement, safety governor, fasteners, Complete new modernized outer casing IP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms LP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Complete set of diaphragms. Inner casing, materials for modernisation of LP outer casing, coupling, sealing arrangement, fasteners, Rotor and diaphragms lifting device for units (9 to 13). Jacking oil pump (1 set). Electro hydraulic governing system (1 set). Auxiliary equipment: Ejectors, Condenser tubes 100% replacement Generator(1 set). : Stator winding bars and winding, Supply of end packets and shunts for stator and assembly, Generator C&I, Gas analyzer cabinet, Generator instrumentation cabinet, Conductivity instruments, Moisture measurement system, Group cables for generator C&I area for connection between junction boxes and cabinets, between cabinets, between C&I cabinets and UCB. TG Auxiliaries: Gland steam condenser: Supply of cupronickel tube bundles considered Supply of: Main oil cooler, L.P. heater 1-4 of cupronickel tube bundles, Deaerator, Pipes and supports cooling water line of MOC, Valves upto 65 mm, insulation and cladding, Spares for D/C, A/C oil pumps, S.O.P, Condensate Extraction water pumps, Bearing gear spares, Boiler Feed Pump: BFP cartridge (I No), Hydraulic coupling R16K (2 Nos), RC valve (3 Nos), Connecting coupling strainer & warm up valve, (3 Nos), Drip pump valves & fittings (2 sets), Warm up valve & safety valves for BFP (1set). O/H of Booster Pump & H.P.Heters: Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area

C	R&M/ LE Works		iii) BOP : Capping Amount of Rs. 60 crores has been of BOP for all the five units of 200MW. Station C&I Equipment, SWAS system, Flue gas analysers, Instrumentation cables for auto loop & measurement loops, Max DNA based DCS panels for measurement loops, Back-up control desk (for auto control & measurement loops) for critical operation for safe shut down of unit), Alarm system excepting for generator area., Sequence of event recording SOE (integral part of DCS), Interlocks & protection for fans & BFP (maxDNA based system), Static excitation system: Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares.
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date	20.6.2006	
4	Date of Start of work	13.07.2011	
5	Expected/Actual date of Completion of work	November, 2013 (E)	
6	Estimated Cost (Rs in Cr)	Rs 1702.14 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 1136.81 Cr (On unit 9-13)	

Dismantling of boiler completed.

Complete refurbishment of boiler & ESP and Overhauling of turbine (at existing capacity)

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Supply started
1	Name of Power Station	OBRA	i) Boiler : 100%Replacement damaged ceiling structure, Refractory and thermal insulation- Replacement 180 nos. HP and LP valves, 200 nos. route valves, replacement/repair of fuel oil system valves, replacement of 8 nos. spray control valves and piping for Desuper heater in super heater and reheater, replacement of 4 nos. control valves, 2 nos. drum safety valves, 2 nos. reheater safety valves, all other safety valves superheater will be serviced. 100%Replacement of valves in PRDS system. .Skin Casing, Hangers & supports of Main steam pipe. 100% alignment of water walls. Correction of Buck stays, guide channels, vertical channel, corner attachment from 8M to 48M, replacement of all peep holes & man holes. 100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, O/H of Boiler Drum & Internals, Economizer., 100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system. Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system. O/H & repair of damaged parts of FD fans. 100% Replacement of ID fans with 10% enhanced capacity. Cold air ducts, Hot air ducts, Flue gas ducts, Compensators in cold air ducts, Compensators in cold air ducts, Sampling coolers, Dampers and gates, Scanner air fan. O/H & Replacement of damaged parts of P.A. Fans., Suit blowing system, wall blowers. 100% Replacement of Raw coal scrapper feeder (2 Nos.), Wind box & Coal burners of coal burners & Coal dust pipes and bends with ceramic lining of Coal Milling and firing system. Complete O/H of Oil firing system: Replacement of Control & Instrumentation: Boiler Controls, FSSS (BMS), Secondary Air Damper Control Panels (SADC), Soot Blower Control Panels (SBC Panels), Cables between consoles and DCS cabinets, Interconnecting cables between DCS cabinets, Auto Control Loops for Boiler (max DNA based).
2	Unit No. & capacity	U-12 (200 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	01/1979	
B. RLA Study / Consultancy			
Description		Boiler	TG.
Estimated Cost (Rs in Cr)	1 crore for RLA of the unit has been covered along with the uprating of units (200 MW to 216 MW)		
Executing Agency	BHEL	BHEL	
Expected/ Actual start of work			
Completion date			
Actual Expenditure (Rs in Cr)			
			ii) TG : HP Turbine:: Fully bladed new rotor,- New blading set complete stages, Complete machined new shaft, Inner casing including guide blades sealing arrangement, safety governor, fasteners, Complete new modernized outer casing IP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms LP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Complete set of diaphragms. Inner casing, materials for modernisation of LP outer casing, coupling, sealing arrangement, fasteners, Rotor and diaphragms lifting device for units (9 to 13). Jacking oil pump (1 set). Electro hydraulic governing system (1 set). Auxiliary equipment: Ejectors, Condenser tubes 100% replacement Generator(1 set). : Set of accumulator (1 set), Rewinding of generators rotors (1 No), Retaining ring (2 Nos), Generator C&I, Gas analyzer cabinet, Generator instrumentation cabinet, Conductivity instruments, Moisture measurement system, Group cables for generator C&I area for connection between junction boxes and cabinets, between cabinets, between C&I cabinets and UCB. TG Auxiliaries: Gland steam condenser: Supply of cupronickel tube bundles considered Supply of: Main oil cooler, L.P. heater 1-4 of cupronickel tube bundles, Deaerator, Pipes and supports cooling water line of MOC, Valves upto 65 mm, insulation and cladding, Spares for D/C, A/C oil pumps, S.O.P, Condensate Extraction water pumps, Bearing gear spares, Boiler Feed Pump: BFP cartridge (I No), Hydraulic coupling R16K (2 Nos), RC valve (3 Nos), Connecting coupling strainer & warm up valve, (3 Nos), Drip pump valves & fittings (2 sets), Warm up valve & safety valves for BFP (1set). O/H of Booster Pump & H.P.Heters: Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area

C	R&M/ LE Works		iii) BOP :
1	Executing Agency Boiler/ TG.	BHEL	Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW. Station C&I Equipment, SWAS system, Flue gas analysers, Instrumentation cables for auto loop & measurement loops, Max DNA based DCS panels for measurement loops, Back-up control desk (for auto control & measurement loops) for critical operation for safe shut down of unit), Alarm system excepting for generator area., Sequence of event recording SOE (integral part of DCS), Interlocks & protection for fans & BFP (maxDNA based system), Static excitation system: Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares.
2	No. of Activities Boiler/ TG.		
3	Zero date	20.6.2006	
4	Expected Date of Start of works	*	
5	Expected date of Completion of works		
6	Estimated Cost (Rs in Cr)	Rs 1702.14 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 1136.81 Cr (On unit 9-13)	

***After completion of R&M / LE works of boiler and O/H of turbines of units 10 &11 at rated capacity. Thereafter Unit 12 & 13 will be taken up.**

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A		Project Details	Description	Broad Scope of Works
				Supply started
1	Name of Power Station	OBRA		i) Boiler : 100%Replacement damaged ceiling structure, Refractory and thermal insulation- Replacement 180 nos. HP and LP valves, 200 nos. route valves, replacement/repair of fuel oil system valves, replacement of 8 nos. spray control valves and piping for Desuper heater in super heater and reheater, replacement of 4 nos. control valves, 2 nos. drum safety valves, 2 nos. reheater safety valves, all other safety valves superheater will be serviced. 100%Replacement of valves in PRDS system. .Skin Casing, Hangers & supports of Main steam pipe. 100% alignment of water walls. Correction of Buck stays, guide channels, vertical channel, corner attachment from 8M to 48M, replacement of all peep holes & man holes. 100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, O/H of Boiler Drum & Internals, Economizer.. 100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system. Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system. O/H & repair of damaged parts of FD fans. 100% Replacement of ID fans with 10% enhanced capacity. Cold air ducts, Hot air ducts, Flue gas ducts, Compensators in cold air ducts, Compensators in cold air ducts, Sampling coolers, Dampers and gates, Scanner air fan. O/H & Replacement of damaged parts of P.A. Fans., Suit blowing system, wall blowers. 100% Replacement of Raw coal scrapper feeder (2 Nos.), Wind box & Coal burners of coal burners & Coal dust pipes and bends with ceramic lining of Coal Milling and firing system. Complete O/H of Oil firing system: Replacement of Control & Instrumentation: Boiler Controls, FSSS (BMS), Secondary Air Damper Control Panels (SADC), Soot Blower Control Panels (SBC Panels), Cables between consoles and DCS cabinets, Interconnecting cables between DCS cabinets, Auto Control Loops for Boiler (maxDNA based).
2	Unit No. & capacity	U-13 (200 MW)	Upgradation to 216 MW	
3	Make			
	i) Boiler	BHEL		
	ii) TG.	BHEL		
4	Date of commissioning	01/1979		
B. RLA Study / Consultancy				
Description		Boiler	TG.	ii) TG :
Estimated Cost (Rs in Cr)		1 crore for RLA of the unit has been covered along with the uprating of units (200 MW to 216 MW)		HP Turbine:: Fully bladed new rotor,- New blading set complete stages, Complete machined new shaft, Inner casing including guide blades sealing arrangement, safety governor, fasteners, Complete new modernized outer casing IP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms LP Turbine: Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Complete set of diaphragms. Inner casing, materials for modernisation of LP outer casing, coupling, sealing arrangement, fasteners, Rotor and diaphragms lifting device for units (9 to 13). Jacking oil pump (1 set). Electro hydraulic governing system (1 set). Auxiliary equipment: Ejectors, Condenser tubes 100% replacement Generator(1 set). : Set of accumulator (1 set), Rewinding of generators rotors (1 No), Retaining ring (2 Nos), Generator C&I, Gas analyzer cabinet, Generator instrumentation cabinet, Conductivity instruments, Moisture measurement system, Group cables for generator C&I area for connection between junction boxes and cabinets, between cabinets, between C&I cabinets and UCB. TG Auxiliaries: Gland steam condenser: Supply of cupronickel tube bundles considered Supply of: Main oil cooler, L.P. heater 1-4 of cupronickel tube bundles, Deaerator, Pipes and supports cooling water line of MOC, Valves upto 65 mm, insulation and cladding, Spares for D/C, A/C oil pumps, S.O.P, Condensate Extraction water pumps, Bearing gear spares, Boiler Feed Pump: BFP cartridge (1 No), Hydraulic coupling R16K (2 Nos), RC valve (3 Nos), Connecting coupling strainer & warm up valve, (3 Nos), Drip pump valves & fittings (2 sets), Warm up valve & safety valves for BFP (1set). O/H of Booster Pump & H.P.Heters: Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-regenerative Area
Executing Agency		BHEL	BHEL	
Expected/ Actual start of work				
Completion date				
Actual Expenditure (Rs in Cr)				

C	R&M/ LE Works		iii) BOP : Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW. Station C&I Equipment, SWAS system, Flue gas analysers, Instrumentation cables for auto loop & measurement loops, Max DNA based DCS panels for measurement loops, Back-up control desk (for auto control & measurement loops) for critical operation for safe shut down of unit), Alarm system excepting for generator area., Sequence of event recording SOE (integral part of DCS), Interlocks & protection for fans & BFP (maxDNA based system), Static excitation system: Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares.
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date	20.6.2006	
4	Expected date of Start of work	*	
5	Expected date of Completion of work		
6	Estimated Cost (Rs in Cr)	Rs 1702.14 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 1136.81 Cr (On unit 9-13)	

***After completion of R&M / LE works of boiler and O/H of turbines of units 10 &11 at rated capacity. Thereafter Unit 12 & 13 will be taken up.**

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works	
			Order Placed and Supply of steel has started.	
1	Name of Power Station	Harduaganj	i) Boiler : Conversion of Tangent type of boiler into Membrane type boiler. Conversion of Ball mills into Bowl Mills.	
2	Unit No. & capacity	U-7 (105/110 MW) Upgradation to 120MW		
3	Make			
	i) Boiler	BHEL		
	ii) TG.	BHEL		
4	Date of commissioning	03/1978		
B. RLA Study / Consultancy (NTPC has been appointed for consultancy works)				
Description		Boiler	TG.	ii) TG :
Estimated Cost (Rs in Cr)				Replacement of old HP Turbine with New HP Turbine along with Inner casing, Diaphragm, Rotor (with blades).
Executing Agency				Replacement of old Inner MP casing with New Inner MP casing, Diaphragm and Rotor (with blades).
Expected/Actual start of work				Modernisation of LP casing, New Diaphragm and Rotor (with blades).
Completion date				Replacement of old governing system with new Electronic- Hydroelectric governing system.
Actual Expenditure (Rs in Cr)				Replacement of old 125 MVA transformer with new 150 MVA transformer
C	R&M/ LE Works			iii) BOP :
1	Executing Agency Boiler/ TG.		BHEL	New max DNA C&I system in place of old C&I system. BOP works for almost complete power station. Note: A capping amount of Rs 9.0 crores has been kept (will be paid on mutual agreement between BHEL and UPRVUNL on the bases of RLA studies will be carried out BHEL. Supply of materials/equipments has been started.
2	No. of Activities Boiler/ TG.			
3	Zero date			
4	Date of Start of work		March, 2011	
5	Expected Date of Completion		June,2013	
6	Estimated Cost (Rs in Cr)		Rs 392 Cr	
7	Actual Expenditure incurred (Rs in Cr)		Rs. 190.7 Cr.	

Present Status : Progress of work is very slow. UPRVUNL apprehended that the completion of work may further be delayed.

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Order Placed
1	Name of Power Station	Parichha	i) Boiler :
2	Unit No. & capacity	1 (110 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	03/1984	
B.	RLA Study / Consultancy		(NTPC has been appointed for consultancy works)
	Description	Boiler	TG.
	Estimated Cost (Rs in Cr)		
	Executing Agency		
	Expected/ Actual start of work		
	Completion date		
	Actual Expenditure (Rs in Cr)		
C	R&M/ LE Works		iii) BOP :
1	Executing Agency Boiler/ TG.	BHEL	CHP: Replacement 2 Nos. Plough feeders, 13 Nos Vibrofeeders, 13 Nos rack & pinion gates, bunker sealing arrangement at bunker floor, belt scrapers -17 Nos, idlers, pulleys, 1 No. ring granulator, transfer chutes, surge hopper in crusher house with liners, gear box of conveyor drive, strengthening of structure for all conveyors, safety switches, pull card, belt sway, for all conveyors.
2	No. of Activities Boiler/ TG.		AHP: Supply, fabrication and erection of bottom ash hoppers, structure for bottom ash hoppers along with refractory, 4-way solenoid valves, slurry pipe(150 M), L P water piping with fitting, air piping with fitting motorized valves. Replacement of 2 Nos ash slurry disposal pipe lines (1KM). Complete civil, electrical, and C&I work for CHP & AHP.
3	Zero date		DM Plant: Replacement of alkali storage tank, acid storage tank, acid transfer pump(1 No), alkali transfer pump(1No), anion pimps (4 Nos), degasser pumps (4 Nos), degasser blowers (2 Nos), acid & alkali dozing system, pipes.
4	Expected Date of Start of work		Compressed Air system: Replacement of 4 Nos instrument air compressors, 4 Nos air dryers with pipings.
5	Expected Date of Completion of work		Fire protection system: New Fire alarm system, Foam pourer system for FO/LDO tanks.
6	Estimated Cost (Rs in Cr)	Rs 343.25 Crs for both unit 1&2	Electrical system: Replacement of 7 Nos ABCB breakers with SF-6 breaker, Replacement of 11 Nos Isolators, 6 Nos lightening arrestors
7	Actual Expenditure incurred (Rs in Cr)		ESP augmentation

*UPRVUNL has informed telephonically that they have awarded study for techno-economical viability of the LE works to the consultant M/s Evonik. The consultant has submitted the report which shall be examined by UPRVUNL authority.

The approval of Govt. of U.P. for R&M scheme is under progress by Energy Task Force.

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Order Placed
1	Name of Power Station	Parichha	i) Boiler : Modification in Economiser system along with inlet/outlet headers & elements. Replacement of water wall panels including burner panel and radiant roof tubes. Superheater System: Replacement of Steam cooled wall tube (fully), LTSH coils and terminal tubes (fully), Radial Roof tubes 1 st pass & Roof panels of 2 nd pass (fully). Replacement of De-Superheater System, Re-heater coils & headers. Replacement of All conventional valves of size below 65mm. Replacement of all safety valves, escape pipes, drum safety valves, MS safety valves, CRH & HRH safety valves, Soot blower lines, Soot blower lines safety valve along with SB control station and thermal drain system to suit the new C&I system Replacement of volumetric feeders with Microprocessor based dual belt gravimetric feeders. Replacement of Seal air system for Pulverisers. Replacement of existing coal pipes to suit the XRP 623 mills. Replacement of existing wind boxes with HEA igniters. Piping, valves & fittings of HFO/ LDO system will be redesign and refurbished to suit the NEW C&I system. Replacement of existing Air cooled oil guns. Replacement of existing hot air and cold air ducting, fuel gas ducting. Replacement of existing Refractory and insulation wool. Replacement of soot blowers system along with soot blowers lines, control station, drain station and valves. Replacement of Hangers and supports, Critical piping for PRDS along with piping, valves, Auxiliary steam piping, Blow down piping. Replacement of Air preheater (2 Nos. per boiler) Refurbishment of existing FD fan & , P A fan (2 Nos each per boiler). Replacement of ID fans (3 Nos per boiler) along with hydraulic coupling. Replacement of seal Air fans (2 Nos per boiler) along with motorNew C&I system for boiler and its auxiliaries.
2	Unit No. & capacity	2 (110 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	02/1985	
			(NTPC has been appointed for consultancy works)
			ii) TG :

B.	RLA Study / Consultancy		
Description	Boiler	G.	ii) TG : Replacement of H.P. turbine along with inner casing, rotor with improved design bladings, improved design casing, improved gland boxes along with new gland rings. Replacement of M.P. inner casing, rotor with improved design bladings, improved gland boxes along with new gland rings. Modernisation of L.P. casing and replacement of old diaphragm with new diaphragm and rotor. Replacement of old governing system with new electronic governing system.
Estimated Cost (Rs in Cr)			
Executing Agency			
Expected/ Actual start of work			
Completion date			
Actual Expenditure (Rs in Cr)			

C	R&M/ LE Works		iii) BOP : CHP: Replacement 2 Nos. Plough feeders, 13 Nos Vibrofeeders, 13 Nos rack & pinion gates, bunker sealing arrangement at bunker floor, belt scrapers -17 Nos, idlers, pulleys, 1 No. ring granulator, transfer chutes, surge hopper in crusher house with liners, gear box of conveyor drive, strengthening of structure for all conveyors, safety switches, pull card, belt sway, for all conveyors. AHP: Supply, fabrication and erection of bottom ash hoppers, structure for bottom ash hoppers along with refractory, 4-way solenoid valves, slurry pipe(150 M), L P water piping with fitting, air piping with fitting motorized valves. Replacement of 2 Nos ash slurry disposal pipe lines (1KM). Complete civil, electrical, and C&I work for CHP & AHP. DM Plant: Replacement of alkali storage tank, acid storage tank, acid transfer pump(1 No), alkali transfer pump(1No), anion pumps (4 Nos), degasser pumps (4 Nos), degasser blowers (2 Nos), acid & alkali dosing system, pipes. Compressed Air system: Replacement of 4 Nos instrument air compressors, 4 Nos air dryers with pipings. Fire protection system: New Fire alarm system, Foam pourer system for FO/LDO tanks. Electrical system: Replacement of 7 Nos ABCB breakers with SF-6 breaker, Replacement of 11 Nos Isolators, 6 Nos lightening arrestors
1	Executing Agency Boiler/ TG.		
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Expected date of Start of work.		
5	Expected Date of Completion of work.		
6	Estimated Cost (Rs in Cr)	Rs 343.25 Cr for unit 2 BTG and BOP & ESP of unit 1&2	
7	Actual Expenditure incurred (Rs in Cr)		

- UPRVUNL has informed telephonically that they have awarded study for techno-economical viability of the LE works to the consultant M/s Evonik.
- The approval of Govt. of U.P. for R&M scheme is under progress by Energy Task Force.

Status of LE works of Punjab State Power Corporation Ltd. (PSPCL)

(As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Unit commissioned
1	Name of Power Station	Bathinda	i) Boiler : Complete replacement of existing indirect fired boiler with direct fired boiler. Replacement of air heaters, flue gas ducting, fuel firing system, milling system, upgradation for direct firing & fans etc.
2	Unit No. & capacity	U-3 (110 MW) Upgradation to 120 MW	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	29.7.1978	
B.	RLA Study / Consultancy		
	Description	Boiler TG.	ii) TG : Retrofitting of HP, IP & LP cylinders. Replacement of turbine gland sealing system, HP heaters, Control valves, RCV valves.
	Estimated Cost (Rs in Cr)	0.28	
	Executing Agency	CPRI, Bangalore	
	Actual start of work	02/01 02/01	
	Completion date	03/01 03/01	
	Actual Expenditure (Rs in Cr)	0.28	
C	R&M/ LE Works		iii) BOP : ESP rectification. Ash Handling System (Replacement of ash slurry pipe lines etc.) Complete replacement of Instrument & Controls. Electrical system : Replacement of existing 220 KV ABCB with SF-6 breakers. Replacement of Pneumatic 220 KV Isolators with motor operated mechanism, Replacement of 6.6 KV switchgear etc. Civil and structural works of boiler and auxiliaries.
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Actual Date of Start of work	14.01.2010	
5	Expected/Actual Date of Completion of work	05.08.2012(A)	
6	Estimated Cost (Rs in Cr)	483.95 Cr. For U-3 & 4	
7	Actual Expenditure incurred (Rs in Cr)	434.3 Cr. for U-3&4	

Physical Progress :

Order for R&M and uprating works on units – 3& 4 was placed on BHEL on Vide by PSPCL letter No 02/R&M-121 dated 14.11.2006. **Shut down taken from 14.01.2010.** After dismantlement work of Boiler, erection work of Boiler started from 18.06.2010. Boiler was lighted up on 29.05.2012, Chemical cleaning by EDTA has been completed on 02.06.2012. Turbine put on barring gear on 17.-7.2012, Unit synchronised on oil on 18.7.2012 and on coal on 5.8.2012.

The unit is recommissioned on 05.08.2012. Unit has achieved 120 MW load.

Status of LE works of Punjab State Power Corporation Ltd. (PSPCL)

(As on 30.09.2013)

A	Project Details	Description	Broad Scope of Works
			Order Placed
1	Name of Power Station	Bathinda	i) Boiler : Complete replacement of existing indirect fired boiler with direct fired boiler. Replacement of air heaters, flue gas ducting, fuel firing system, milling system, upgradation for direct firing & fans etc.
2	Unit No. & capacity	U-4 (110 MW) Upgradation to 120 MW	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of comming	31.01.1979	
B.	RLA Study / Consultancy		
	Description	Boiler TG.	ii) TG : Retrofitting of HP, IP & LP cylinders. Replacement of turbine gland sealing system, HP heaters, Control valves, RCV valves.
	Estimated Cost (Rs in Cr)	0.28	
	Executing Agency	CPRI, Bangalore	
	Actual start of work	11/01 11/01	
	Completion date	12/01 12/01	
	Actual Expenditure (Rs in Cr)	0.32	
C	R&M/ LE Works		
1	Executing Agency Boiler/ TG.	BHEL	iii) BOP : ESP rectification. Ash Handling System (Replacement of ash slurry pipe lines etc.) Complete replacement of Instrument & Controls. Electrical system : Replacement of existing 220 KV ABCB with SF-6 breakers. Replacement of Pneumatic 220 KV Isolators with motor operated mechanism, Replacement of 6.6 KV switchgear etc. Civil and structural works of boiler and auxiliaries.
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Actual date of Start of work	5.11.2011	
5	Expected Date of Completion of work.	July,2013	
6	Estimated Cost (Rs in Cr)	483.95 Cr. for U-3 & 4	
7	Actual Expenditure incurred (Rs in Cr)	446.95 Cr. for U-3&4	

Order for R&M and uprating works on units – 3& 4 was placed on BHEL Vide PSPCL letter No 02/R&M-121 dated 14.11.2006. Unit taken under s/d on 05.11.2012., 90% erection work of boiler, 40% of work of turbine and its auxiliaries, 55% C&I works, 73% electrical & BOP works and 94% civil works completed. As per latest status given by BHEL, Unit-4 expected to be synchronized by the end of Oct' 2013.

Western Region

(Unit wise Broad Status of LE works)

There is no unit in western region where order for LE has been placed.

Southern Region

(Unit wise Broad Status of LE works)

STATUS OF LE WORKS OF Dr. NARLA TATA RAO THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Dr.N.T.TPS	i) Boiler : The scope of works includes : 2) Replacement of hot & cold air dampers and gates for bowl mills. 3) Replacement of water walls, Superheater , Reheater, Soot blower system, 4) Replacement of ID fans with higher capacity ii) TG : The scope of works includes : 1) Repair /Refurbishment of HP,IP&LP turbine 2) Up graded design of boiler feed pump- 200 KHI, Recirculation valves, various valves & pipes of BFP, HP/ LP bypass and PRDS valves. 3) Replacement of various oil coolers. iii) Electrical & Instrument: The scope of works includes : 1) Replacement of 3 nos. CWP motors, 21 nos. ESP transformers, station battery with chargers, 6.6. kV Protection Relay, Generator Transformer, UATs, Bus- bar protection, Generator protection, CTs, 200 kV MOCBs with SF6 brakers etc. 2) Re-winding of HT motors of BFPs, CEPs, PA Fans, FD fans and mills. 3) Installation of DCS including field instruments, microprocessor based soot blowing System, FSSS, SWAS System, 4) Replacement of public address system iv) BOP : The scope of works includes : 1) Replacement of CW pumps and raw water pipeline. 2) Augmentation of DM plant, Ash handling system. Replacement of Air compressor, Renovation of Coal handling plant,
2	Unit No. & capacity		U-1 ,210MW	
3	Make		BHEL/ BHEL	
4	Date of Commissioning		U# 1-	
B	RLA Studies / Consultancy			
	Description	Boiler	TG	
1	Estimated Cost (Rs.Lacs.)	17.6		
2	Executing Agency	Utility Powertech Ltd., Noida		
3	Exp / Act Start date	Boiler-Turbine – Generator Stator-		
4	Comple-tion date	Boiler-25.08.2004 Turbine –25.08.2004 Generator - 16.08.2004		
5	Actual Exp. (Rs.Lacs.)	16.68		
C	R&M / LE works			
1	Estimated cost for both units no-1&2 (Rs. Cr.)		Rs.193.83	
2	Executing Agency : Boiler/ TG		Various agencies	
3	No. of activities : Boiler / TG			
4	Date of start / completion (E/A)		Start Dt: Oct., 2005/ Ongoing	
5	Actual Expenditure incurred (Rs. Cr.)			

STATUS OF LE WORKS OF Dr. NARLA TATA RAO THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Dr.N.T.TPS	i) Boiler : The scope of works includes : 1) Renovation of LTSH coil assembly 2) Replacement of hot & cold air dampers and gates for bowl mills. 3) Replacement of water walls, Superheater , Reheater, Soot blower system, 4) Replacement of ID fans with higher capacity 5) Replacement of CRH coil, SCAPH coil, Damaged water walls, Expansion joints, Damaged ducts from APH ouTlet to chimney, Damaged hangers, Feed water pipe lines, CRH, HRH, MS lines, boiler insulation, Air pre heater rotor assembly, ID fans dampers valves ii) TG : The scope of works includes : 1) Repair /Refurbishment of HP,IP&LP turbine 2) Up graded design of boiler feed pump- 200 KHI, Recirculation valves, various valves & pipes of BFP, HP/ LP bypass and PRDS valves. 3) Replacement of various oil coolers. 4) Re-insulation of generator rotor with F class. iii) Electrical & Instrument: The scope of works includes : 1) Replacement of 3 nos. CWP motors, 21 nos. ESP transformers, station battery with chargers, 6.6. kV Protection Relay, Generator Transformer, UATs, Bus- bar protection, Generator protection, CTs, 200 kV MOCBs with SF6 brakers etc. 2) Re-winding of HT motors of BFPs, CEPs, PA Fans, FD fans and mills. 3) Installation of DCS including field instruments, microprocessor based soot blowing System, FSSS, SWAS System, 4) Replacement of public address system iv) BOP : The scope of works includes : 1) Replacement of CW pumps and raw water pipeline. 2) Augmentation of DM plant, Ash handling system. Replacement of Air compressor, Renovation of Coal handling plant, 3) Replacement of CI & CS bends/ elbows with ceramic bends/ elbows. 4) Modernisation of goods lifts.
2	Unit No. & capacity		U-2 ,210MW	
3	Make		BHEL/ BHEL	
4	Date of Commissioning		U# 2-	
B	RLA Studies / Consultancy			
	Description	Boiler	TG	
1	Estimated Cost (Rs.Lacs.)	17.6		
2	Executing Agency	IRC Engg. Services India Pvt., Ltd., New Delhi		
3	Exp / Act Start date	Boiler-Turbine – Generator Stator-		
4	Comple-tion date	Boiler-09.08.2007 Turbine –25.08.2007 Generator Trf. - 13.12.2006		
5	Actual Exp. (Rs.Lacs.)	16.68		
C	R&M / LE works			
1	Estimated cost for both units no-1&2 (Rs. Cr.)		Rs.193.83	
2	Executing Agency : Boiler/ TG		Various Agencies	
3	No. of activities : Boiler / TG			
4	Date of start / completion (E/A)		Start Dt: Oct., 2005/ Ongoing	
5	Actual Expenditure incurred (Rs. Cr.)			

STATUS OF LE WORKS OF TUTICORIN THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Tuticorin TPS	i) Boiler : The scope of works includes : 1 ii) TG : The scope of works includes : 1) iii) Electrical & Instrument: The scope of works includes : 1 iv) BOP : The scope of works includes : 1)
2	Unit No. & capacity		U-1 ,210 MW	
3	Make		BHEL/ BHEL	
4	Date of Commissioning		U# 1-	
B	RLA Studies / Consultancy			
	Description	Boiler	TG	
1	Estimated Cost (Rs.Lacs.)			
2	Executing Agency			
3	Exp / Act Start date			
4	Comple-tion date			
5	Actual Exp. (Rs.Lacs.)			
C	R&M / LE works			
1	Estimated cost for both units no-1&2 (Rs. Cr.)			
2	Executing Agency : Boiler/ TG			
3	No. of activities : Boiler / TG			
4	Date of start / completion (E/A)			
5	Actual Expenditure incurred (Rs. Cr.)			

Eastern Region

(Unit wise Broad Status of LE works)

STATUS OF LE WORKS OF BIHAR (BSEB) THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description		Broad status of various activities
1	Name of Power Station		Barauni TPS		Unit under s/d since 17.03.2012. As per BHEL unit shall be synchronised by June,2014. i) Boiler : The scope of works includes : 1) Strengthening of Structure(columns, backstays, ceiling girders, floor grills, hand grills, painting) 2) Furnace bottom sealing arrangements 3) Replacement of water walls, Superheater , Reheater, Soot blower system, Economizer, drain& vent piping, Hangers & Supports 4) Pulverized fuel firing system-Coal mills (5 no.), Coal feeders (5 no.), PF piping 5 no. sets), Seal air system (2x100%) 5) Fuel oil firing system 6) Supply/Replacement of Draft & Ducting System (APH,PA fan, FD fan, ID fan, Air and Flue gas ducting 7) Refurbishment of ESP ii) TG : The scope of works includes : 1) Refurbishment of HP,IP&LP turbine 2) Replacement/ Refurbishment of Shaft turning gear, Turbine governing system, lubricating oil coolers, Hydrogen coolers, Jacking oil pump, Seal oil coolers, Condenser, HP heaters, LP Heaters, Steam jet air ejector, Deaerator, BFP, CEP, Chimney Steam condenser and chimney exhaust fan, Turbine drain system valves, Hangers& Supports 3) Replacement/ Refurbishment of existing AVR with digital DVR incl. necessary modifications and existing excitation system incl. supply of necessary spares. 4) Complete overhauling of generator stator, Testing & varnishing of rotors and refurbishment of silica gel Hydrogen drier incl. supply of necessary spares. 5) Replacement/Supply/Testing of transformers, isolated phase Bus-duct of generator, Protection panels, 6.6 KV Switchgears, Bus changeover scheme ,LT Switchgears and Bus ducts, LT Motors, HT Motors , Station Lighting, Cabling, Earthing and Lighting Protection, Station Batteries & Chargers, Emergency AC Supply System, 132 KV Switchyard. 6) Installation of Distributed Digital Control Monitoring & Information System(DDCMIS) and other C&I Systems iii) BOP : The scope of works includes : 1) Supply and installation of Tube well system, CW System, Aeration System, DM Plant, Softening plant, CW Chlorination System, Air Compressors, Cooling towers, Misc. pump house, AC plant, Ventilation system, Fire fighting system 2) Replacement/ Refurbishment/Repair of Coal Handling Plant, Ash Handling Plant & F.O. Unloading Plant.
2	Unit No. & capacity		U-6 ,110MW		
3	Make		BHEL/ BHEL		
4	Date of Commissioning		U# 6-01.05.1983		
B	RLA Studies / Consultancy				
	Description	Boiler	TG		
1	Estimated Cost (Rs.Cr.)	Cost included in R&M work			
2	Executing Agency	BHEL	BHEL		
3	Exp / Act Start date	Boiler-4.5.06 Turbine – 18.5.06 Generator Stator-15.5.06			
4	Comple-tion date	Boiler-17.5.06 Turbine –5.6.06 Generator Stator- 17.5.06			
5	Actual Exp. (Rs.Cr.)	R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost.			
C	R&M / LE works				
1	Estimated cost for both units no.6&7 (Rs. Cr.)		Rs.572.16 Cr. (including the cost of RLA*)		
2	Executing Agency : Boiler/ TG		BHEL/ BHEL		
3	No. of activities : Boiler / TG				
4	Date of start / completion (E/A)		LOA:16/02/2010 Zero Date: 16/11/2009 (BHEL to confirm revised schedule)		
5	Actual Expenditure incurred (Rs. Cr.)		Rs. 405.61 Cr. for both the units 1&2 (incl. restoration of Unit-6)		

* Planning Commission vide their letter dated 16.11.2009 approved the revised cost estimates of Rs.1053 crores including consultancy charges under the Special Plan for Bihar for both BTPS & MTPS. Dismantling work completed. HP rotor received at site after repair. IP, LP rotors are sent to BHEL Hyderabad and all turbine bearings sent to HERP, Varanasi for

repair. Boiler material supplied (2649/ 3005) MT, Water wall erection works complete, fit and welding under progress. ESP material supplied (1457/ 1457) MT, Mills material supplied (132/ 390) MT, fans material supplied (169/ 169) MT, APH material supplied (299/ 299) MT. New building work of Ash slurry pump house, foundation work of DM pant, fire pump house and dust suppression system in progress. C&I panels (60/62) installed. Casting of piles at ID fan A completed and that of ID fan B is under progress (23/32).

STATUS OF LE WORKS OF BIHAR (BSEB) THERMAL POWER STATION

(As on 30.09.2013)

A	Project details	Description	Broad status of various activities
1	Name of Power Station	Barauni TPS	Unit under shut down. As proposed by BHEL, anticipated date of synchronization is December, 2013.
2	Unit No. & capacity	U- 7, 110MW	i) Boiler : The scope of works includes : 1) Strengthening of Structure(columns, backstays, ceiling girders, floor grills, hand grills, painting) 2) Furnace bottom sealing arrangements 3) Replacement of water walls, Superheater ,Reheater, Soot blower system, Economizer, drain& vent piping, Hangers & Supports 4) Pulverized fuel firing system-Coal mills (5 no.), Coal feeders (5 no.), PF piping 5 no. sets), Seal air system (2x100%) 5) Fuel oil firing system 6) Supply/Replacement of Draft & Ducting System (APH,PA fan, FD fan, ID fan, Air and Flue gas ducting 7) Refurbishment of ESP
3	Make : Boiler/ TG	BHEL/ BHEL	
4	Date of Commissioning	U# 7-31.03.1985	
B	RLA Studies / Consultancy		
	Description	Boiler TG	
1	Estimated Cost (Rs.Cr.)	Cost included in R&M work	
2	Executing Agency	BHEL	BHEL
3	Exp/ Act Start date	Boiler-4.5.06 Turbine – 18.5.06 Generator Stator-15.5.06	
4	Completion date	Boiler-17.5.06 Turbine –5.6.06 Generator Stator- 17.5.06	
5	Actual Exp. (Rs.Cr.)	R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost.	
C	R&M / LE works		
1	Estimated cost for both units no.6&7 (Rs. Cr.)	Rs. 572.16 Cr. (including the cost of RLA*)	
2	Executing Agency : Boiler/ TG	BHEL/ BHEL	
3	No. of activities : Boiler / TG		
4	Date of start / completion (E/A)	LOA:16/02/2010 Zero Date: 16/11/2009 Mach, 2013.	
5	Actual Expenditure incurred (Rs. Cr.)	Rs. 405.61 Cr. for both the units 1&2 (incl. restoration of Unit-6)	
ii) TG : The scope of works includes : 1) Refurbishment of HP,IP&LP turbine 2) Replacement/ Refurbishment of Shaft turning gear, Turbine governing system, lubricating oil coolers, Hydrogen coolers, Jacking oil pump, Seal oil coolers, Condenser, HP heaters, LP Heaters, Steam jet air ejector, Deaerator, BFP, CEP, Chimney Steam condenser and chimney exhaust fan, Turbine drain system valves, Hangers& Supports 3) Replacement/ Refurbishment of existing AVR with digital DVR incl. necessary modifications and existing excitation system incl. supply of necessary spares. 4) Complete overhauling of generator stator, Testing & varnishing of rotors and refurbishment of silica gel Hydrogen drier incl. supply of necessary spares. 5) Replacement/Supply/Testing of transformers, isolated phase Bus-duct of generator, Protection panels, 6.6 KV Switchgears, Bus changeover scheme ,LT Switchgears and Bus ducts, LT Motors, HT Motors, Station Lighting, Cabling, Earthling and Lighting Protection, Station Batteries & Chargers, Emergency AC Supply System, 132 KV Switchyard. 6) Installation Of Distributed Digital Control Monitoring& Information System(DDCMIS) and other C&I Systems			
iii) BOP : The scope of works includes : 1) Supply and installation of Tube well system, CW System, Aeration System, DM Plant, Softening plant, CW Chlorination System, Air Compressors, Cooling towers, Misc. pump house, AC plant, Ventilation system, Fire fighting system 2) Replacement/ Refurbishment/Repair of Coal Handling Plant, Ash Handling Plant & F.O. Unloading Plant. In the first phase of R&M, the restoration of BOP has also been done by BHEL.			

*Planning Commission vide their letter dated 16.11.2009 approved the revised cost estimates of Rs.1053 crores including consultancy charges under the Special Plan for Bihar for both BTPS & MTPS. HP, LP & IP rotors and all turbine bearings have been received at site. HP,LP, and IP rotor alignment under progress. Condenser re-tubing completed. Boiler hydro test (drainable) done. All platen superheaters joints completed. Boiler material supplied (2657/ 3002) MT, erection works completed 1670 MT. ESP material supplied (1457/ 1457) MT, erection completed 1068 MT, Mills piling works completed,

mills material supplied (126/ 348) MT, Fans material supplied (164/ 169) MT, civil works of fan is progress, APH material supplied (299/299) MT, APH foundation completed, erection in progress. New building work of Ash slurry pump house, foundation work of DM pant, fire pump house and dust suppression system in progress. BHEL revised schedule for synchronisation is 15.03. 2014.

STATUS OF LE/R&M WORKS OF BIHAR (KBUNL) THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description		Broad status of various activities
1	Name of Power Station		Muzaffarpur TPS		Unit s/d on 06.10.2003 and Synchronised on 05.07.2013. i) Boiler: The scope of works includes : 1) Replacement/refurbishment of Furnace water walls, Economizer, Super Heater, Re heater, Steam cooled wall tubes, SH&RH DESH station, Soot blowing system, Drain and vents, Fuel preparation and firing system. 2) Fuel Oil Firing System. 3) Renovation/ Overhauling of APH &Draft system 4) Refurbishment of ESP 5) Replacement of Gates & dampers and Sample cooler along with valves and piping 6) Supply of Hangers and supports, BHEL Vision (electronic water level indicator) 7) Servicing of Boiler drum with internals and strengthening of boiler main structure and painting ii) TG: The scope of works includes : 1) Replacement/repairs/polishing & modification of HP/IP/LP Turbine 2) Replacement of all flexible hoses 3) Balancing of all finished rotor & repairing of casing 4) Refurbishment of Shaft Turning gear(U-1 only),Turbine Governing System, Turbine gland system, Deaerator, Steam jet air ejector 5) Supply/replacement of Lubricating oil coolers, Seal oil coolers, Hydrogen coolers, Jacking oil pumps, condenser tubes, HP Heaters, LP Heaters, BFP,CEP, Condensate booster pump, Turbine drain system valves, Turbine governing valves, Insulation, Turbine lube oil system, TG Bearing & Coupling bolts 6) Installation Of Distributed Digital Control Monitoring & Information System(DDCMIS) 7) Complete overhauling of generator stator & complete testing /varnishing of generator rotor. 8) Regarding Electrical works, Refurbishment / replacement/supply of transformers, Generator bus duct, Protection panels, Bus changeover schemes, 220/132KV Switchyard. iii) BOP : The scope of works includes : R & M of Bore well system ,Fire fighting system, Pre Treatment Plant, DM Plant , Chlorination Plant , Cooling Tower, Compressed Air System, Air Conditioning System, Ash Handling System, Fuel Oil System, Workshop, CW System, Raw Water System, Feed Water Booster Pumps, Chemistry Lab.
2	Unit No. & capacity		U-1,110MW		
3	Make		BHEL/BHEL		
4	Date of Commissioning		31.03.1985		
B	RLA Studies / Consultancy				
	Description	Boiler	TG		
1	Estimated Cost (Rs.Cr.)	a) Included in restoration cost for unit # 2 b) For unit # 1 Not charged			
2	Executing Agency	BHEL	BHEL		
3	Exp / Act Start date	Boiler-4.5.06 Turbine – 18.5.06 Generator Stator-15.5.06			
4	Comple-tion date	May 2008			
5	Actual Exp. (Rs.Cr.)	R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost.			
C	R&M / LE works				
1	Estimated cost for both units no.1&2 (Rs. Cr.)		471.80		
2	Executing Agency : Boiler/ TG		BHEL/ BHEL		
3	No. of activities : Boiler / TG		48 Packages		
4	Date of start / completion (E/A)		LOA:15/04/2010 15.07.2010 April ,2013 (E)		
5	Actual Expenditure incurred (Rs. Cr.)		356.4 Cr for both the units 1&2. (incl. restoration of Unit-2		

Status: Unit synchronized on 05.07.2013.

STATUS OF LE/R&M WORKS OF BIHAR (KBUNL) THERMAL POWER STATION

(As on 30.09.2013)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Muzaffarpur TPS	Unit under shut down i) Boiler: The scope of works includes : 1) Replacement/refurbishment of Furnace water walls, Economizer, Super Heater, Re heater, Steam cooled wall tubes, SH&RH DESH station, Soot blowing system, Drain and vents, Fuel preparation and firing system. 2) Fuel Oil Firing System 3) Renovation/ Overhauling of APH &Draft system 4) Refurbishment of ESP 5) Replacement of Gates & dampers and Sample cooler along with valves and piping 6) Supply of Hangers and supports, BHEL Vision (electronic water level indicator) 7) Servicing of Boiler drum with internals and strengthening of boiler main structure and painting ii) TG: The scope of works includes : 1) Replacement/repairs/polishing & modification of HP/IP/LP Turbine 2) Replacement of all flexible hoses 3) Balancing of all finished rotor & repairing of casing 4) Refurbishment of Shaft Turning gear(U-1 only),Turbine Governing System, Turbine gland system, Deaerator, Steam jet air ejector. 5) Supply/replacement of Lubricating oil coolers, Seal oil coolers, Hydrogen coolers, Jacking oil pumps, condenser tubes, HP Heaters, LP Heaters, BFP,CEP, Condensate booster pump, Turbine drain system valves, Turbine governing valves, Insulation, Turbine lube oil system, TG Bearing & Coupling bolts 6) Installation Of Distributed Digital Control Monitoring & Information System(DDCMIS) 7) Complete overhauling of generator stator & complete testing/varnishing of generator rotor 8) Regarding Electrical works, Refurbishment / replacement/supply of transformers, Generator bus duct, Protection panels, Bus changeover schemes, 220/132KV Switchyard. *Partly restored during restoration of unit -2. iii) BOP : The scope of works includes : R & M of Bore well system ,Fire fighting system, Pre Treatment Plant, DM Plant , Chlorination Plant , Cooling Tower, Compressed Air System, Air Conditioning System, Ash Handling System, Fuel Oil System, Workshop, CW System, Raw Water System, Feed Water Booster Pumps, Chemistry Lab. *Partly restored during restoration of unit -2. Both the streams of CHP become operational on 20.04.2010. R&M of one wagon Tippler completed in Sept.'2010.
2	Unit No. & capacity		U-2,110MW	
	Make		BHEL/BHEL	
4	Date of Commissioning		17.03.1986	
B	RLA Studies / Consultancy			
	Description	Boiler	TG	
1	Estimated Cost (Rs.Cr.)	a) Included in restoration cost for unit # 2 b) For unit # 1 Not charged		
2	Executing Agency	BHEL	BHEL	
3	Exp / Act Start date	Boiler-4.5.06 Turbine – 18.5.06 Generator Stator-15.5.06		
4	Completion date	Nov-2006		
5	Actual Exp. (Rs.Cr.)	R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost.		
C	R&M / LE works			
1	Estimated cost for both units no.1&2 (Rs. Cr.)		471.80	
2	Executing Agency : Boiler/ TG		BHEL/ BHEL	
3	No. of activities : Boiler / TG		48 Packages	
4	Date of start / completion (E/A)		LOA:15/04/2010 Sept.' 2011 (BHEL to confirm revised schedule)	
5	Actual Expenditure incurred (Rs. Cr.)		356.4 Cr for both the units 1&2. (incl. restoration of Unit-2	

Status: Boiler material supplied (1770/ 2123) MT, erection work in progress. LP, IP Rotors dispatched for repair expected by August 2013. All turbine bearings sent to HERP Varanasi for repair.C& I material supply completed. Mills material supplied (50/ 180) MT. Supply of fans, APH, ESP, Ducts and Dampers completed. Expected synchronisation by 15 Feb, 2014.

STATUS OF LE WORKS OF WEST BENGAL (WBPDC) THERMAL POWER STATION

(As on 30.09.2013)

A	Project details	Description	Broad status of various activities
1	Name of Power Station	Bandel	Contract for BTG Package awarded to M/s. DHIC and signed on 29.02.2012.
2	Unit No. & capacity	U-5 , 210MW	Main Plant Package (BTG)
3	Make : Boiler/TG	AVB/BHEL	Boiler: * Replacement of major Valves, Controllers & Hangers and Supports in Boiler & Turbine Area * Replacement of Water wall tubes, Attemperators * Replacement of Economiser coil * Replacement of Platen Superheater coils * Replacement of Final Superheater tubes * Complete replacement of Air pre heater tubes * Up-gradations of Mills and auxiliaries * Modification of ESP to achieve 90 mg/Nm ³ emission level at ESP Outlet Turbine: * Complete replacement of HP, IP & LP turbine * Complete tube replacement of Condenser, LP & HP Heaters * Replacement of BFP Cartridge with high efficient cartridge * Replacement of CEP, CW Pump Generator: * Replacement of Generator by new Generator
4	Date of Commissioning	23/03/1983	
B	RLA Studies / Consultancy		
	Description	Boiler	TG
1	Estimated Cost (Rs.Cr.)		
2	Executing Agency	M/s Evonik	
3	Exp / Act Start date		
4	Completion date	January 2005)	
5	Actual Exp. (Rs.Cr.)		
C	R&M / LE works (Estimated cost: Rs.652 Cr.		
1	Total No. of package	4 (four) – BTG, CHP, Electrical & AHP.	

2	Executing Agency : BTG package	M/s DHIC	
3	Zero date	29.02.2012	
4	Date of start (Original/ Expected /Actual)	Expected Date of start	
5	Date of completion (Original/ Expected /Actual)	Sept 2014 (E).	
6	Actual Expenditure incurred (Rs. Cr.)		

Physical Progress:

BTG Package:

Supply of plant & machinery has been started in Sept., 2013. The shut down of the unit for execution of the R&M works is expected on 05.11.2013,. Expected date of completion of BTG package is June, 2014.

CHP Package:

The contract with M/s Vinar Systems Pvt. Ltd. has been signed on 3rd January, 2013. Overall cumulative progress for design engineering and procure till July, 2013 is 30.93%.

AHP Package:

Contract is signed on 29th April, 2013 with M/s. MBPL. Project execution Plan, Master MQP list & L-2 schedule has been submitted. Design engineering and procurement is in progress.

Electrical Package:

The contract has been signed with M/s Alstom T&D India Ltd. on 28-12-2012. Overall cumulative progress for design engineering and procurement is achieved till July, 2013 is 15.63%