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Central Electricity Authority

ताप विद्युत नवीनीकरण एवं आधुनिकीकरण प्रभाग
Thermal Renovation and Modernisation Division



Quarterly Review Report
Renovation, Modernisation and Life Extension of
Thermal Power Stations
{1st Quarter of 2011-12, (April' – June', 2011)}

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Foreword

In order to meet the growing power demand in the country, Govt. of India have taken a number of initiatives which, inter-alia, include new multi modal generation capacity addition. To further supplement the above efforts in the area of efficient power generation, Renovation & Modernisation (R&M) and Life Extension (LE) of the existing old power stations have been recognized as one of most cost-effective option due to its short gestation period and low cost.

The Thermal Renovation & Modernisation (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 till the units are re-commissioned. Based on the information received from various utilities undertaking the R&M/LE works, the Quarterly Review Report (QRR) is prepared regularly by TRM Division and circulated to senior officers in MOP and CEA to keep them abreast with the latest status regarding the physical and financial progress of R&M/L works at various thermal units. The QRR is also available on CEA website <http://cea.nic.in> .

In order to carry out R&M/LE works, Bathinda TPS Unit – 3 (110 MW), Amarkantak Extn. TPS Unit – 1 (120 MW), Barauni TPS Unit – 7 (110 MW), Muzaffarpur TPS Unit – 1 (110 MW) & H'Gunj unit -7 (110MW) were already under shut down and supply of materials/equipments continued for above mentioned thermal units. Dismantling works at Bhatinda TPS unit -3 had been completed and erection work of boiler has been started. About 32% Boiler erection works at Muzaffarpur TPS Unit-1 has been completed and Hydro Test of boiler is expected by the end of July, 2011. The LE works at Amarkantak Extn TPS unit -1 is likely to be completed by Sept./Oct, 2011..

Under Indo-German Energy Forum (IGEF) assisted programme, the DPR for R&M/LE works for unit-3 of Nasik TPS has been prepared and accepted by MAHAGENCO. The DPRs of unit – 1, 2 & 3 of Bokaro TPS and unit – 1, 2 & 3 of Kolaghat TPS are under finalization. A consultant M/s Lahmeyer Institutional (India) Ltd has also been selected 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' under Phase II activity of IGEF Programme.

The World Bank is providing technical assistance of US\$1.1 million as a part of GEF grant under Coal Fired Generation Rehabilitation Project to CEA for addressing the barriers to Energy Efficiency R&M in India. M/s. ABPS Infrastructure Advisory Services Ltd., had been appointed in implementing the 'Technical Assistance to CEA' project and the short listing of consultants for other four consultancy services is under process.

As per the MOU signed between Central Electricity Authority and Japan Coal Energy Centre (JCOAL) for preliminary study of Efficiency and Environment improvement study in coal fired power plants between Central Electricity Authority and JCOAL, JCOAL have submitted detailed diagnosis report on 6th May, 2011 of the pre-primary studies at three thermal units viz., unit – 1 of Vijayawada TPS, unit 1 of Wanakbori TPS and unit 5 of Ramagundem STPS. Under 2nd phase, a tripartite MOU among CEA, JCOAL and JBIC is proposed to be signed for detailed studies at three selected thermal units viz., unit – 1 of Vijayawada TPS of APGENCO, unit - 1 of Wanakbori TPS of GSECL and one unit of NTPC.

We heartedly acknowledge and appreciate the co-operation of the Utilities/Organisations 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.

Highlights

1. R&M and LE programme from 7th Plan onwards till 10th Plan

S. No	5-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) 7/ (25)	18991 (17306) (1685)	14500	2200
4	10 th Plan (R&M) (LEP)	2002-03 to 2006-07	9/25 (14 out of 57 planned) (11 out of 106 *)	3445 (2460) (985)	2000	300

*Out of 106, 23 units were considered under PIE programme and 45 units were found techno-economically unviable.

** Equivalent MW has been worked out considering PLF during the respective plan period.

2. LE/R&M Programme during 11th Plan (2007 – 2012)

Sl No.	Particular	State Sector		Central Sector		Total (State sector + Central Sector)	
		No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
1.	LE works	33	4524	20	2794	53	7318
2.	R&M works	27	6015	49	12950	76	18965
	Total	60	10539	69	15744	129	26283

3. LE/R&M Programme during 12th Plan (2012 – 2017) tentative

Sl No.	Particular	State Sector		Central Sector		Total (State sector + Central Sector)	
		No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
1.	LE works	30	5860	42	10672.19	72	16532.19
2.	R&M works	03	630	20	4341	23	4971
	Total	33	6490	62	15013.19	95	21503.19

4. Achievement during 11th Plan (From April, 2007 to June, 2011)

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)
1.	LE works completed	9	904	3	267	12	1171
2.	R&M works completed	20	4485	39	10370	59	14855
3.	R&M works* additional completed			4	240	4	240
	TOTAL	29	5389	46	10877	75	16266

* In addition, R&M works in respect of 4 number of units of Talcher TPS of 60 MW each which were not originally envisaged for R&M works in National Perspective Plan were also completed by NTPC.

5. Important Achievements in Monitoring of R&M Projects

- i) KBUNL Muzaffarpur Unit-1 (110 MW) – About 76% Boiler materials reached at site and about 32% Boiler erection works completed.
As proposed by BHEL to meet synchronization of unit 1 by 30.11.2011, the following milestones have been targeted as under.
 - Hydrotest by 31.7.2011
 - Boiler light up by 15.9.2011
 - Turbine boxup by 15.10.2011
- ii) BSEB Barauni unit -7 (110MW) – About 83% Boiler materials reached at site. As proposed by BHEL, anticipated date of synchronization is 31st March, 2012.
- iii) Hardua Ganj unit – 7 (110MW) – 95% Boiler dismantling work is completed. Foundation work of ESP, CHP and condenser re tubing works are in progress.
- iv) Obra unit – 9 (200MW) – After rectifying the faults, the unit was lighted up again and synchronized on 26.6.2011 and maximum load achieved during trial run was 200MW with full opening of Control Valve Servo Mechanism (CVSM). But due to problem such as axial shift, hunting in CVSM, machine is forced to run in CVSM full opening condition, BHEL recommended that the unit load may be restricted to 150-160 MW. **Unit is expected to be stabilized at full load ie uprated capacity of 216 MW after another 2 to 3 months by doing the required modifications.**

6. External Co-operation for R&M (LE) of TPS

The following activities were undertaken:-

(A) KfW assisted Programme

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

a) Unit-3 of Nasik TPS

The Final DPR was prepared by M/s. Evonik and accepted by Mahagenco/MERC.

b) Unit 1, 2 &3 of Bokaro 'B' TPS

For finalization of the DPR of unit – 1, M/s Evonik have sought some confirmation for some parameters and the same is awaited from DVC.

c) Unit 1,2 & 3 of Kolaghat TPS

The revised draft DPR of unit - 3 based on the revised parameters is likely to be submitted by mid July, 2011 from M/s Evonik.

(ii) Phase – II activity for development of tendering procedures and preparation of Model Contract for R&M Projects.

M/s Lahmeyer Institutional (India) Ltd has been selected for further negotiations to carry out phase – II activities. The negotiation meeting was held on 20.6.2011 and a Draft Contract Document to be signed between CEA and M/s Lahmeyer Institutional (India) Ltd was also discussed.

(B) Technical Assistance to CEA funded by World Bank

M/s. ABPS Infrastructure Advisory Services Ltd., was appointed for implementing four numbers of project through consultant under the 'Technical Assistance to CEA' funded by World Bank. The Reports on short-listing of consultants and RfP documents for two consultancy services were submitted to World Bank on 29.04-2011. In reply to query raised by the World Bank, the details reports on short-listing of consultants, cost estimates, latest details of nature of association & revised TORs were sent to World Bank on 14-06-2011. 'No Objection' from World Bank is awaited.

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

JCOAL have submitted Detail-diagnosis report on 6th May, 2011 and the same were discussed in a meeting held with JCOAL on 18th May, 2011 at CEA. It was broadly agreed that unit – 1 of Dr. N.T. Rama Rao (Vijayawada) TPS of APGENCO and unit - 1 of Wanakbori TPS of GSECL would be taken up for further detailed study. CEA suggested that either Vindychal or Kahalgaon STPS of NTPC should be taken for detail-diagnosis as these two power stations have LMZ turbines. However, the final selection of the NTPC's unit is yet to be made. The draft of 2nd phase MOU to be executed among CEA, JCOAL and JBIC has been sent to MOP for their approval on 14.6.2011.

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 31.3.2010 was 159398 MW of which Thermal power plants contributed 84198 MW (Coal based) and 17055 MW (Gas based).

Many of the thermal power plants are not operating to their full potential. Also large numbers of thermal units are old and outlived their normal life. Renovation and Modernisation (R&M) and Life Extension (LE) of existing old power stations have been recognized as an effective option to achieve additional generation from existing units at low cost and short gestation period. Besides generation improvement and life extension, other benefits achieved from R&M / LE include improvement in availability, safety, reliability and environmental emissions.

Presently, a large number of 200/210 MW units have completed or are near completion of their normal design life. The perspective R&M programme aims at extending their operating life further and also up grade their performance through Energy Efficient 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 latest technology equipment and systems with a view to improving their performance in terms of output, reliability and 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 10th 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. But the same could, however not be sustained during 10th Plan. The plan wise details are given below :-

Sl. No.	5-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) 7/ (25)	18991 (17306) (1685)	14500	2200
4	10 th Plan (R&M) (LEP)	2002-03 to 2006-07	9/25 (14 out of 57 planned) (11 out of 106 *)	3445 (2460) (985)	2000	300

*Out of 106, 23 units were considered under PIE programme and 45 units were found techno-economically unviable.

** Equivalent MW has been worked out considering PLF during the respective plan period.

5.0 National Perspective Plan

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

In the Perspective Plan, 53 units (7318 MW) for LE works and 76 units (18965 MW) for R&M works have been identified in 11th Plan and for 12th Plan 72 units (16532 MW) for LE work and 23 units (4871 MW) for R&M work have been identified.

6.0 LE / R&M Programme during 11th Plan (2007 - 08 to 2011-12)

The Sector wise break up of units identified for LE/R&M works during 11th plan is furnished as under :-

Sl No.	Particular	State Sector		Central Sector		Total (State sector + Central Sector)	
		No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
1.	LE works	33	4524	20	2794	53	7318
2.	R&M works	27	6015	49	12950	76	18965
	Total	60	10539	69	15744	129	26283

6.1 Life Extension Programme Status during 2007-08 to 2010-11 of the 11th Plan:

During the first four years of 11th Plan (till Mar., 2011), LE works have been completed in 12 units comprising 9 units in the state sector and 3 units of NTPC in the central sector out of total 53 units planned for 11th plan. Sector wise details of units where LE works have been completed are furnished as under:-

6.1.1. State Sector (7 Nos. of units)

1. Obra TPS Unit – 1 (40 MW)
2. Obra TPS Unit – 2 (40 MW)
3. Obra TPS Unit – 6 (94 MW)
4. Obra TPS Unit – 9 (200 MW)*
5. Haduaganj TPS Unit – 5 (60 MW)
6. Panipat TPS Unit – 1 (110 MW)
7. Ukai TPS Unit – 1 (120 MW)
8. Ukai TPS Unit – 2 (120 MW)
9. Amarkantak TPS Unit – 2 (120 MW)

*The unit is under stabilization.

6.1.2 Central Sector (3 Nos. of units)

1. Anta CCGT (NTPC) GT – 1 to 3 (3x89 MW)

Sub total (LE) - 12 Units (1171 MW)

6.2. R & M Programme Status during 2007-08 to 2010-11 of the 11th Plan:

Similarly, during the first four years of the 11th Plan (till Mar., 2011), R&M works have been completed in 59 nos. of units comprising 20 nos. of units and 39 nos. of units in the state and central sector respectively as against total 76 nos. of units planned for the 11th plan. Sector wise details of units where R&M works have been completed are furnished as under:-

6.2.1 State Sector (20 Nos. of units)

1. Ropar TPS Unit – 1 to 6 (6x210 MW)
2. Koradi TPS Unit – 5 to 7 (1x200 + 2x210 MW)
3. Chandrapur TPS Unit – 1 to 6 (4x210 + 2x500 MW)
4. Parli TPS Unit – 3 to 5 (3x210 MW)
5. Rajghat TPS Unit – 1&2 (2x67.5 MW)

6.2.2 Central Sector

DVC (2 Nos. of units)

1. Durgapur TPS (DVC) Unit 3 & 4 (130 MW + 210 MW)

NTPC (37 nos. of units)

1. Korba STPS Unit – 1 to 6 (3x200 + 3x500 MW)
2. Vindhyachal STPS Unit – 1 to 6 (6x210 MW)
3. Ramagundem STPS Unit – 1 to 6 (3x200 + 3x500 MW)
4. Farakka STPS St-I, Unit – 1 to 3 (3x200 MW)
5. Tanda TPS Unit – 1, 3 & 4 (3x110 MW)
6. Talcher TPS , Unit – 5 & 6 (2x110 MW) *
7. Singrauli STPS Unit 1 to 7 (5x200 + 2x500 MW)
8. Unchahar TPS St. – 1, Unit 1 & 2 (2x210 MW)
9. Rihand St – 1, Unit 1 & 2 (2x500 MW)

* In addition, R&M completed in Talcher TPS Unit – 1 to 4 (4x60 MW) which were not originally envisaged for R&M works in National Perspective Plan by NTPC.

Sub total (R&M) - 63 Units (15095 MW)

Total (LE and R&M) - 75 Units (16266 MW)

6.3 Overall LE / R&M status during 11th Plan (From April'2007 to June'2011)

Out of 53 units (7318 MW) for LE works and 76 units (18965 MW) for R&M works planned for 11th plan, LE works in 12 units (1171 MW) and R&M works in 59 units (14855 MW) were completed during the first four years of the 11th plan. Gist of LE and R&M works completed during the 11th plan (till March, 2011) are tabulated below:

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 (till March, 2011)	9	904	3	267	12	1171
B)	R&M works						
2.	Completed during 11 th Plan (till March, 2011)	20	4485	39	10370	59	14855
3.	Additional Completed*			4	240	4	240
	TOTAL	29	5389	46	10877	75	16266

* In addition, R&M completed in Talcher TPS Unit – 1 to 4 (4x60 MW) which were not originally envisaged for R&M works in National Perspective Plan by NTPC.
(Details attached at **Appendix IA & IB**)

6.3.1 Target vis-a-vis achievement during the first four years of the 11th Plan:

Out of 129 units planned for LE/R&M works during 11th plan (60 units in State Sector and 69 units in Central Sector with a capacity 26283 MW), LE/R&M works in respect of 71 units (29 numbers in State Sector and 42 number in Central Sector) of total capacity of 16026 MW) were completed (till March, 2011). In addition, 4 numbers of units of Talcher TPS of 60 MW each which were not originally envisaged for R&M works in National Perspective Plan, were also completed thereby increasing the total number of units where R&M/LE works completed to 75 nos. with a capacity of 16266 MW. In terms of nos. of units as well as capacity, 55% and 61% of targets planned for 11th plan have been achieved respectively during the first four years of the 11th plan.

6.4 Progress during the quarter (April' – June' 2011)

6.4.1 LE works completed during the quarter (April' – June' 2011)

During the **first** quarter of year 2011-12 LE works have not been completed in any unit of state and central sector.

(a) State Sector

Nil

(b) Central Sector

Nil

6.4.2 R&M works completed during the quarter (April' – June' 2011)

During the **first** quarter of year 2011-12, R&M works have not been completed in any unit of state sector.

(a) State Sector (2 nos units)

Nil

(b) Central Sector

Nil

List of units where LE & R&M works have been completed during 11th Plan as on 30th June, 2011 is furnished at **Appendix I-A & I- B** respectively. Unit-wise status of LE works (single page Broad Status) pertaining to State Utilities is furnished at **Appendix – IV**.

7.0 LE and R&M Targets during 2011 – 12 of 11th Plan

Broad details of State / Central Sector wise LE/R&M works to be taken up during 2011 – 12 of 11th Plan are furnished below:

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)
1	LE works	6	760	-	-	6	760
2	R&M works	-	-	10	2580	10	2580
	TOTAL	6	760	10	2580	16	3340

Unit-wise and Sector details of LE and R&M works to be taken up during remaining one year of 11th Plan are furnished in **Appendix II A & II B** respectively.

Therefore, out of remaining 58 units, LE/R&M works are to be completed in respect of 16 nos. of units of total capacity of 3340 MW during remaining period of 1 year of the 11th Plan and LE/R&M works in respect of the rest 42 units of total capacity 6917 MW would likely to be slipped beyond 11th Plan (Details attached at **Appendix – III A & IIIB**).

8.0 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 60% 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 completing 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 & Upgrading (LE&U) has shifted primarily from “generation maximization” to “performance enhancement” with efficiency improvement and plant upgrading as an integral part.**

- 8.1** 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.

9.0 External Co-operation for R&M of TPS

The KfW-Germany has financed Energy Efficiency R&M programme on seven old thermal units of 210 MW at three thermal power stations in India. Similarly the World Bank has financed the Coal Fired Rehabilitation Programme – India for demonstration of Energy Efficiency Rehabilitation & Modernisation of Coal Fired Generating Units for rehabilitation of 640 MW capacity across the three states – West Bengal, Haryana and Maharashtra in India. In addition, KfW has agreed “in principle” to finance the project for Standardisation of the Tendering Procedures and Preparation of Model Contract for the R&M of Fossil Fuel Based Power Plants in India. Also, 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. The details of the above programme are as follows:-

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

Under Energy Efficiency Programme, KfW Development Bank –Germany has provided a soft loan of Euro 90 million for the implementation of energy efficient R&M at the following thermal power plants:

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

In addition to the above, KfW Bank has 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 above seven units through a consultant. M/s Evonik Energy Services GmbH, Germany have been selected as consultant through ICB route to prepare feasibility study / DPR for the above seven(07) units at three power stations. The implementation of R&M/LE works based on the Detailed Project Report (DPRs) would be taken up by the concerned utilities.

a) Nasik TPS

The DPR for Unit-3 (210 MW) was prepared in MERC format by M/s Evonik and submitted to Mahagenco. The DPR was submitted by Mahagenco to MERC for 'in principle' approval. The MERC has given the 'in principle' clearance on 01.04.2011. The final DPR has been prepared by M/s Evonik and accepted by MAHAGENCO.

b) Bokaro 'B' TPS

The DPR for Unit-1(210 MW) of Bokaro 'B' TPS has been prepared by M/s Evonik in May, 2011. DVC gave their comments/observations on the DPR. After incorporating the comments/observations of DVC & CEA, the M/s Evonik modified the DPR of unit – 1 and sent to DVC/CEA. For finalization of the DPR, M/s Evonik have sought some confirmation for some parameters and the same is awaited from DVC.

c) Kolaghat TPS

The Draft Feasibility Report (DFR) for unit 3 of Kolaghat TPS was submitted in first week of June 2010. After discussion between CEA, WBPDC and M/s Evonik the scope of R&M work were finalized. The DPR for Unit-3 (210 MW) of Kolaghat TPS was prepared by M/s Evonik and submitted to CEA in March, 2011. The same was examined by CEA/WBPDC In May , 2011 WBPDC have revised the parameters for consideration for preparation of DPR. The revised draft DPR based on the revised parameters is likely to be submitted by mid July, 2011 from M/s Evonik.

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

A task force on “development of tender procedure and model contracts for the Renovation & Modernization (R&M) of fossil fuel based power plants” under the chairmanship of Member (Thermal),CEA was constituted vide MoP letter no. 5/33/2009-S.Th. dated 29/10/2009 comprising the members from various power utilities. The scope of the assignment to be completed by the task force is divided in two phases as under:

Phase-I Task

It comprises of an assessment of tendering procedures currently being followed by public utilities in India and a review of documents used for standard R&M projects and the documents which have already been developed for energy efficient R&M projects financed by particularly World Bank.

Phase-II Task

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

The first meeting of task force was held on 20th November 2009 in CEA, N Delhi to discuss the report of phase-I activity i.e. “Review of tendering procedures and documents followed by public utilities for renovation & modernization projects” and further approach & methodology for development of the tendering procedures and model contract for the R&M of fossil fuel based power plants under Phase-II activity.

For selection of the consultant for carrying out phase II activity, NIT was published in India and Germany with last date of submission as 10th Jan.' 2011. The technical and financial evaluation of the bids was carried out by a tender agent appointed by KfW. Based on the evaluation, M/s Lahmeyer Institutional (India) Ltd has been selected for further negotiations. The negotiation meeting was held on 20.6.2011 and a Draft Contract Document to be signed between CEA and M/s Lahmeyer Institutional (India) Ltd was also discussed during the negotiation meeting held on 20.6.201.

9.3 “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) of coal fired generating units through rehabilitation of 640 MW of capacity across three States- West

Bengal, Haryana and Maharashtra. The project would also address critical barriers to large scale EE R&M in India. The project is funded through IBRD loan of USD 180 million and GEF grants of USD 45.4 million. Out of GEF grant of US \$ 45.4 million, US \$ 7.5 million have been earmarked for technical assistance components. Out of this technical assistance components, CEA has been provided a grant of US \$ 1.1 million to carry out various studies related to R&M of thermal power stations in India through appointment of some consultants. The above project has two components:-

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

This component would fund 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 address Critical Barriers to EE R&M

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.

9.3.1 World Bank funded EE R&M Pilot Projects

i) Bandel TPS, U-5 (210 MW) of WBPDC

DPR for the R&M project consisting following major packages have been prepared by the M/s Evonik Energy Services (Project design consultant):-

- a) Main Plant Package (BTG -Boiler, Turbine & Generator)
- b) Coal Handling Plant (CHP)
- c) Ash Handling Plant & Water System (AHP & Water)
- d) Electrical System.

The Cost of the project is around Rs. 478 crores (335 +143; Loan + Equity) with a Loan: Equity ratio as 70:30. The execution period of the project is 24 months as per tender document.

The first stage bidding for BTG (Main Plant Package) was held in September, 2009 and out of four bids received, only one was found responsive. Due to regularity norms, WBPDCCL could not proceed for next stage bidding having only one bid responsive. WBPDCCL took a decision for re-bidding and accordingly a proposal was placed before World Bank for their “No objection”. World Bank gave their “No objection” on 02.06.2010.

Accordingly WBPDCCL invited fresh bidding (single stage) for BTG package after getting No Objection from World Bank in September, 2010. The last date for submission of bid was 22-03-2011. Two bids were received. Bid evaluation report has been sent to World Bank in the first week of May, 2011 for their ‘No Objection’. The same is awaited. For other remaining three packages, finalization of Technical & Commercial specifications are in process.

ii) Koradi TPS, U-6 (210MW) of Mahagenco

The fund allocation for the EE R&M of U-5(210 MW) of Koradi TPS is around 59.00 million US \$ (loan) and grant US \$ 12.45 million. M/s Evonik Energy Services have been selected as Project Design Consultant w.e.f Nov., 2007. M/s Evonik prepared the DPR of the R&M project consisting four major packages BTG, Electrical, CHP & other BOP. The DPR with an estimated cost of Rs. 486 Crs. was accepted and approved by Mahagenco Board. Final reports for Environmental Audit & Due Diligence (EADD) and Rapid Social Assessment (RSA) were submitted and accepted by Mahagenco. 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 dated 24-05-2010.

The R&M project consists of four major packages BTG, Electrical, CHP & other BOP. NIT (1st stage) for BTG packages was floated on 7th August, 2010 with last submission date 15th Feb, 2011. Mahagenco is in the process of preparing evaluation report for the 1st stage. After preparing the evaluation report (1st stage), the same will be sent to World Bank for their ‘No Objection’.

For Electrical Package, tender specifications prepared. World Bank’s ‘No Objection’ received on 25-01-2011. The NIT was floated on 31-05-2011 and Pre Bid Meeting was held on 05-07-2011. The bid will be opened on 05-08-2011.

For BOP Package, tender specifications sent to World Bank for their “No Objection”. The “No Objection” has been received from World Bank and the Tender specifications will be presented for approval during the next meeting of MSPGCL Board.

For CHP Package, the Tender specifications are under preparation.

iii) Panipat TPS, U-3 & 4 (2x110MW) of HPGCL

Total cost of the R&M project of U-3&4 (2x110 MW) of Panipat TPS is around Rs. 448.4 Cr. Fund allocation for the Panipat TPS is around US \$ 62 million (Loan) and Grant US \$ 13 million. M/s SMEC, Gurgaon had submitted Rapid Social Assessment (RSA) report on 27.09.2010. M/s Energo Engineering Projects has been appointed as Design consultant on 03-11-2010 for preparation of DPR and other bid documents. M/s Energo has completed RLA study & Energy Audit of U-3&4. DPRs for both the units were submitted by M/s Energo on 30-06-2011.

9.3.2 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 scheme would be implemented through appointment of consultants for carrying out the 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.

M/s ABPS Infrastructure Advisory Services Ltd has been appointed as implementation support consultant (ISC) by CEA w.e.f. 28-10-2010 to assist CEA in procurement of the above consultants and in implementing the "Technical Assistance to CEA" project.

The Reports on short-listing of consultants and RfP documents for two consultancy services were submitted to World Bank on 29.04-2011. In reply to query raised by the World Bank, the details reports on short-listing of consultants, cost estimates, latest details of nature of association & revised TORs were sent to World Bank on 14-06-2011. 'No Objection' from World Bank is awaited.

9.4 Japan-India co-operation for Pre- Primary study of Efficiency and Environmental improvement of Coal fired stations

India and Japan have been going through a series of intense discussion to materialize the bilateral cooperation, based on the spirit of cooperation in the Power and Coal Sectors as envisaged in the Joint Statement, at the Japan-India Energy Policy Dialogue on September 17, 2008.

Furthermore, the discussion during the Steering Committee and the subsequent Working Group of Japan-India Energy Policy Dialogue on March 16, 2009, brought Japan and India respectively represented by METI and MOP, to an agreement that the efficiency improvement in existing thermal power stations in India is a highly prioritized area of cooperation. METI and MOP 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 the spirit of above a MOU between Central Electricity Authority and JCOAL for preliminary study of Efficiency and Environment improvement study in coal fired power plants was signed during the meeting of India-Japan high level Energy Dialogues held in New Delhi on 30.4.2010.

The purpose of this MOU is to carryout necessary diagnostic activities for 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. **Japan-India co-operation for Pre- Primary study of Efficiency and Environmental improvement of Coal fired stations.**

JCOAL had short listed four candidate coal fired power plants viz. Ukai and Wanakbori TPS (GSECL), Ramagundem STPS (NTPC) and Vijaywada TPS (APGENCO) for pre – primary studies. A Pre-Primary Questionnaire prepared by JCOAL was forwarded to concerned utilities and related data had been received from the utilities. A team of experts from JCOAL accompanied by CEA Officers visited four candidate coal fired power plants viz. Ukai and Wanakbori TPS (GSECL), Ramagundem STPS (NTPC) and Vijaywada TPS (APGENCO) during 26th Aug.' to 1st Sept.' 2010 for pre-primary studies and had short listed three units viz. Wanakbori TPS (GSECL), Ramagundem STPS (NTPC) and Vijaywada TPS (APGENCO) for further studies.

A JCOAL expert team had visited Wanakbori TPS (GSECL), Ramagundam STPS (NTPC) and Vijaywada TPS (APGENCO) during 21st to 27th Nov.' 2010 for detailed studies. The summary of the Draft report was submitted by JCOAL in last week of Dec. 2010. Findings of their studies have been submitted by them in March, 2011.

JCOAL have finally submitted Detail-diagnosis report on 6th May, 2011 and the same were discussed in a meeting held with JCOAL on 18th May, 2011 at CEA where representative from NTPC and GSECL were also present. It was broadly agreed that unit – 1 of Dr. N.T. Rama Rao (Vijayawada) TPS of APGENCO and unit - 1 of Wanakbori TPS of GSECL would be taken up for further detailed study.

In view of over all conditions of the Ramagundem unit – 5 being satisfactory, JCOAL conveyed the wish of NTPC that they would like to select one of the three TPS, that is, Vindychal, Rihand or Kahalgaon. CEA suggested that either Vindychal or Kahalgaon should be the target as these two power stations have LMZ turbines. However, **the final selection of the NTPC's unit is yet to be made.**

The 2nd phase MOU among CEA, JCOAL and JBIC is proposed to be signed. The draft of the same after getting approval from Chairperson, CEA have been sent to MOP for their approval on 14.6.2011.

9.5 Financial Assistance by World Bank under GEF facility as Grant for 12TH Plan

World Bank has made available GEF Grant for various studies viz. Design, Environment Audit & Due Diligence (EADDA) and Rapid Social Assessment (RSA) for LE works under 12th plan at various thermal units of Mahagenco. The units of Mahagenco proposed for above mentioned studies are Bhusawal units 2&3 (2x210MW) , Chandrapur units 1&2 (2x210MW) and Parli unit 3 (1x210MW).

List of Units where LE Works have been completed during 11th Plan

(AS ON 30.06.2011).

A. State Sector

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Com.	Cap. (MW)	Completion Year	Present status / Expected Date of Completion
1	UPRVUNL	Obra	1	1968	40	2009-10	Unit synchronised on 4 th May 2009
2			2	1968	40	2008-09	Unit synchronised on 2 nd February 2009
3			6	1973	94	2007-08	Unit synchronised on 20 th March 2008
4			9	1980	200	2010-11	Unit synchronised on 17 th September 2010. During stabilization two failure occurred on 15 th & 31 st Oct.2010. Expected date of resynchronization is Sept.'2011.
5		H'Gunj	5	1977	60	2008-09	Work completed, unit synchronised in May'08.
6	HPGCL	Panipat	1	1979	110	2008-09	Unit synchronised on 4th Nov'08.
7	GSECL	Ukai	1	1976	120	2008-09	Unit -1 was taken under s/d on 06.9.2006 for LE works, synchronized on 24.5.2008. Unit running at 100 -105 MW load.
8			2	1976	120	2009-10	Unit -2 was taken under s/d for LE on 12th August'08. Synchronised on 24-2-2010.
9	MPPGCL	Amarkantaka Extn.	2	1977	120	2010-11	Unit- 2 was taken under s/d for LE on 26.7.09. Synchronised on 26.8.2010.
Total State Sector (A)			9		904		

B. Central Sector

GAS FIRED

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Com.	Cap. (MW)	Completion Schedule (Actual / Targeted)	Present status / Expected Date of Completion
1	NTPC	Anta GT	1	1989	89	2009-10 (Actual)	Work completed in Feb.2010.
2			2	1989	89		
3			3	1989	89		
		Total	3		267		
Total Central Sector (B)			03		267		

Grand Total (A+B)	12		1171
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List of Units where R&M Works have been completed during 11th Plan

(AS ON 30.06.2011).

Appendix - I B

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A. State Sector

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Comm- issioning	Capacity (MW)	Completion Year
Delhi						
1	IPGCL	Rajghat	1	1989	67.5	2010-11
2			2	1989	67.5	
Punjab						
3	PSPCL	Ropar	1	1984	210	2007-08
4			2	1985	210	
5			3	1988	210	
6			4	1989	210	
7			5	1992	210	
8			6	1993	210	
		Total	6		1260	
Maharashtra						
9	Mahagenco	Koradi	5	1978	200	2007-08
10			6	1982	210	
11			7	1983	210	
		Total	3		620	
12		Chandrapur	1	1983	210	2008-09
13			2	1984	210	
14			3	1985	210	
15			4	1986	210	
16			5	1991	500	
17			6	1992	500	
		Total	6		1840	
18		Parli	3	1980	210	2008-09
19			4	1985	210	
20			5	1987	210	
			Total	3		
Sub Total (A)			20		4485	

B. Central Sector

Appendix - I B

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Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Commissioning	Cap. (MW)	Completion Year
1	DVC	Durgapur TPS	3	1966	130	2008-09
2			4	1984	210	2008-09
		Total	2		340	
1	NTPC	Vindhyanchal STPS	1	1987	210	2009-10
2			2	1987	210	
3			3	1989	210	
4			4	1990	210	
5			5	1990	210	
6			6	1991	210	
		Total	6		1260	
7		Korba STPS	1	1983	200	2009-10
8			2	1983	200	
9			3	1984	200	
10			4	1987	500	
11			5	1988	500	
12			6	1989	500	
		Total	6		2100	
13		Ramagundem STPS	1	1983	200	2009-10
14			2	1984	200	
15			3	1984	200	
16			4	1988	500	
17			5	1989	500	
18			6	1989	500	
		Total	6		2100	
19		Farakka Stg-I STPS	1	1986	200	2009-10
20			2	1986	200	
21			3	1984	200	
		Total	3		600	
22		Tanda TPS	1	1988	110	2009-10
23			3	1990	110	
24			4	1998	110	2010-11
		Total	3		330	
25		Talcher TPS Stg-II	5	1982	110	2009-10
26			6	1983	110	
		Total	2		220	

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Comm- issioning	Cap. (MW)	Completion Year	
27	NTPC	Singrauli STPS	1	1982	200	2009-10	
28			2	1982	200		
29			3	1983	200		
30			4	1983	200		
31			5	1984	200		
32			6	1986	500		
33			7	1987	500		
			Total	7			2000
34		Unchahar TPS	1	1988	210	2009-10	
35			2	1989	210		
		Total	2		420		
36		Rihand Stg - I STPS	1	1988	500	2009-10	
37			2	1989	500		
			Total	2			1000
Sub Total NTPC			37		10030		
Total Central Sector (B)			39		10370		
Total of R&M (A+B)			59		14855		

Details of Units Programmed for LE Works during 2011-12 of 11th Plan

A. State Sector

Status as on 30-06-2011

Sl. No .	Name of Utility	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Completion Schedule (Actual / Targeted)	Present status / Expected Date of Completion
UP							
1		Obra	11	1977	200	2011-12 (Target)	Contract agreement signed with BHEL in Feb, 2007. Shutdown of Unit No. 11 was taken on 10.7.2011.Dismantling work started.
2		H’Gunj	7	1978	110	2011-12 (Target)	LOI issued to BHEL on 25.03.09. Advance payment released in June'09, draft contract prepared by BHEL has been cleared by UPRVUNL and consultant NTPC. S/d for LE works taken in March, 2011, 95% Boiler dismantling work completed. Foundation work of ESP, CHP and condenser re tubing works are in progress.
Punjab							
3	PSEB	Bathinda	3	1978	110	2011-12 (Target)	Order placed on BHEL on 6.11.2006. S/d on unit -3 was taken from 14.1.2010, dismantling work compltd. and erection work of boiler started on 18.06.10. Unit expected to be recommisioned by Nov, 2011.
Madhya Pradesh							
4	MPPGCL	Amarkantak Ext.	1	1977	120	2011-12 (Target)	Works on 11 packages out of 12 completed for unit-1&2. Order for Turbine package placed on NASL in July 07. S/d of U-1 taken on 26.09.10 for LE works. Likely Completion in Sept./Oct, 2011.
	Bihar						
5	BSEB	Barauni	7	1985	110	2011-12 (Target)	U-6 has been restored by BHEL under Rashtriya Sam Vikas Yojana. LOA has been awarded to BHEL on 15th Feb.2010. 83% Boiler materials reached at site. HP rotor of U-7 reached BHEL site at Hyd., LP rotor is lying at Barauni for dispatch to BHEL works and order for IP rotor forging has been awarded to Shanghai Machining Corporation..
6	KBUNL	Muzaffar pur	1	1985	110	2011-12 (Target)	U-2 has been restored under RSVY. LOA awarded on 15.04.10. Kick Off meeting held on 21.05.10. 76% Boiler materials reached at site and 32% Boiler erection works completed. As proposed by BHEL to meet synchronization of unit 1 by 30.11.2011.
Total of State Sector (A)			6		760		
Total Central Sector (B)			-		-		
Grand Total (A+B)			6		760		

Details of Units Programmed for R&M Works during 2011-12 of 11th Plan

A. State Sector

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Commissioning	Capacity (MW)	Completion Schedule (Actual / Targeted)	Present Status
Total of State Sector (A)			Nil		Nil		

B. Central Sector

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Comm- issioning	Capacity (MW)	Completion Schedule (Actual / Targeted)	Present Status	
1	NTPC	Tanda	2	1989	110	2011-12 (Target)	Work in progress.	
		Total	1		110			
2		NCTPP, Dadri	1	1992	210	2011-12 (Target)	Scope of work finalized. CEA clearance on 6.10.08.	
3			2	1992	210			
4			3	1993	210			
5			4	1994	210			
			Total	4				840
6		Farakka Stg-II STPS	4	1992	500	2011-12 (Target)	Scheme under finalisation	
7			5	1994	500			
			Total	2				1000
8		Kahalgaon	1	1992	210	2011-12 (Target)	Scheme under finalisation by NTPC	
9			2	1994	210			
10			3	1995	210			
			Total	3				630
Total Central Sector (B)			10		2580			
Total of R&M (A+B)			10		2580			

Details of Units Programmed for LE Works during 11th Plan but likely to slip beyond 11th Plan**A. State Sector****Status as on 30-06-2011**

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Present status / Expected Date of Completion
1	UPRVUNL	Obra	10	1979	200	Contract agreement signed with BHEL in Feb, 2007. Shutdown of Unit No. 11 was taken on 10.7.2011, the S/d of unit –10 is expected to be taken from Oct, 2011. There after unit 12 & 13 will be taken up.
2			12	1981	200	
3			13	1982	200	
4		Parichha	1	1984	110	The approval for R&M scheme is under process by Energy Task Force of Govt. of Uttar Pradesh.
5			2	1985	110	
6		Panki	3	1976	105	DPR prepared. The R&M scheme is under consideration by Govt. of Uttar Pradesh.
7			4	1977	105	
8		Anpara”A’	1	1986	210	BHEL has been asked to furnish scope of work . Order expected to be placed in 11 th Plan, completion in 12 th Plan.
			2	1986	210	
			3	1988	210	
11	PSPCL	Ropar	1	1984	210	RLA completed. Order expected to be placed in 11 th Plan, completion in 12 th Plan.
12			2	1985	210	
13		Bathinda	4	1979	110	Order placed on BHEL on 6.11.2006. S/d on unit - 3 was taken from 14.1.2010,. Unit expected to be recommisioned by Nov, 2011. Thereafter unit-4 will be taken up.
14	GSECL	Gandhinagar	1	1977	120	*Order awarded to BHEL on 28 May 2007. BHEL has supplied 55% material at site. M/s GSECL mentioned that the matter regarding R&M/LE of Gandhinagar TPS units 1&2 (2x120MW) need not be pursued as per decision of Govt. of Gujarat, GSECL intended to replace existing coal based thermal power plant at Gandhinagar with gas based power plant.
15			2	1977	120	
16	WBPCL	Bandel	5	1982	210	Taken up under World Bank programme.The fresh bid of BTG Pkg has been floated with last date of submission is 22.03.11. Bid evaluation report sent to World Bank for their No objection and the same is awaited.
17	BSEB	Barauni	6	1983	110	U-6 has been restored by BHEL under Rashtriya Sam Vikas Yojana. LOA has been awarded to BHEL on 15th Feb.2010. 83% Boiler materials reached at site. HP rotor of U-7 reached BHEL site at Hyd., LP rotor is lying at Barauni for dispatch to BHEL works and order for IP rotor forging has been awarded to Shanghai Machining Corporation..
18	KBUNL	Muzaffarpur	2	1986	110	U-2 has been restored under RSVY. LOA awarded on 15.04.10. Kick Off meeting held on 21.05.10. 76% Boiler materials reached at site and 32% Boiler erection works completed. As proposed by BHEL to meet synchronization of unit 1 by 30.11.2011.

Total of State Sector (A)**18****2860**

B. Central Sector

(Page 2/2)

(i) Coal Fired

Sl. No .	Name of Utility	Name of Station	Unit No.	Year of Com m.	Cap. (MW)	Present status / Expected Date of Completion	
1	NTPC	Badarpur	4	1978	210	Tech. bids for Main Plant R&M Pkg. opened on 15.12.09. Evaluation of Tech. & comm.. bid in progress.	
2			5	1981	210		
3		Singrauli STPS	1	1982	200	Scheme under finalisation.	
4			2	1982	200		
5		Korba STPS	1	1983	200	Scheme under finalisation.	
6		Ramagunda m	1	1983	200	Scheme under finalisation.	
Total of (i)			6		1220		

(ii) Gas Fired

7	NTPC	Dadri GT	1	1992	131	Scheme finalised. CEA clearance on 30.05.08.
8			2	1992	131	
9			3	1992	131	
10		Auraiya GT	1	1989	111.19	Scheme finalised. Bidding process started for GT renovation and C&I pkgs.
11			2	1989	111.19	
12			3	1989	111.19	
13		Kawas GT	1	1992	106	Scheme finalised. Bidding process started for GT renovation and C&I pkgs.
14			2	1992	106	
15			3	1992	106	
16		Gandhar GT	1	1994	131	Scheme finalised. CEA clearance on 25.05.09.
17			2	1994	131	
Total of (ii)			11		1306.57	
Total Central Sector (B)			17		2527	

Grand Total (A+B)	35		5387
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Details of Units Programmed for R&M Works during 11th Plan but likely to slip beyond 11th Plan**A. State Sector**

Sl. No.	Name of Utility	Name of Station	Unit No.	Year of Commissioning	Capacity (MW)	Present Status
1	UPRVUNL	Anpara'B	4	1993	500	Scope of work yet to be finalised
2		Obra	5	1994	500	
3			7	1974	100	BHEL to submit scope of work
4			8	1975	100	
5	JSEB	Patratu	9	1984	110	Restoration works are in progress
6			10	1986	110	
7	DPL	Durgapur	6	1985	110	Works are in progress
Total of State Sector (A)			7		1530	
Total Central Sector (B)			-		-	
Total of R&M (A+B)			7		1530	

Northern Region

(Unit wise Broad Status of LE works)

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

As on 30.06.2011

A	Project Details	Description	Broad Scope of Works
			Completed
1	Name of Power Station	OBRA	i) Boiler : Replacement of Supporting structure-50t 100% Replacement of Refractory & thermal Insulation. 100% Replacement of safety calves, Feed control valves, drain and vent valves - 100%. 100% Replacement of Main steam pipes including bends & fittings. Replacement of Skin casing 300 m ² . 100% Replacement of Furnace Walls, Headers, Down Flow Pipes, riser tubes, Economiser, Platen SH, Conv SH, radiant SH, Ceiling SH, Attemperator, sing rods and supports. O/H of other boiler equipments Air –Pre- Heater: 100% repl. of tube plates, expansion joints Replacement of F.D.Fans (2 Nos), Replacement of I.D.Fan (1 No). 100% replacement of Cold and Hot Air ducts flue Gas Ducts with supports & hanger with insulation, Damper components, Sample coolers, Hot air for mill ducts. Coal Milling & Firing System: Replacement of 2 Nos Raw coal scraper feeder, armor plates, balls, reduction gear of the Mill (2 Nos), coal dust feeder, Coal burners, coal dust pipes,– 100% replacement HFO Guns (6 Nos) - 100% replacement. O/H of oil firing system. ESP: New ESP in place of Mechanical dust collector. 100% replacement of bottom ash handling system, fly ash handling system Ash slurry pumps (3 Nos), Ash slurry pipeline –. New installation of seal water pumps (1 W + 1 S). O/H of HP &LP flush water pump
2	Unit No. & capacity	U-1 (50 MW)	
3	Make		
	i) Boiler	KKBW	
	ii) TG.	LMW	
4	Date of commissioning	08/1967	
B.	RLA Study / Consultancy		
Description		Boiler	TG.
Estimated Cost (Rs in Cr)		Included in the cost of R&M works	
Executing Agency		TPE, Russia	TPE, Russia

Continued.....

C	LE Works		iii) BOP/ Other works:
1	Executing Agency Boiler/ TG.	TPE Russia, (balance of works were completed U.C.C.I. & ILK)	Phosphate dosing pump (1 No) piping, valve & dosing system-100% replacement Replacement of 4 Nos compressors of compressed air system. Installation of new air conditioning plant. One no New fire water pump, Fire detection system, Major O/H of 100T/20T E O T cranes. Replacement of cargo lift. Hoist & Beams for Ball mills, ID fans, feed water tank, ESP, Deatator, CW pump house, DM plant, ash water pump house & ash slurry pump house Replacement of circulating water pump(2 nos) New DM water treatment plant 2x75 m ³ / hr capacity along with clarifloculator of 350 m ³ / hr capacity and replacement of 350 m of 150 MSRL pipe line. O/H of all the equipment/instruments of WTP and raw water intake system. Refurbishment of Wagon tippers, Wagon tippers hoppers, coal crushers (2 Nos), Pusher car, water spray system, Replacement of about 2000 mts of conveyor belts of 1400mm. wide Provision of Dust suppression Extraction system at all transfer points crushers house. Replacement of other core handling equipment like vibrators, conveyor gallery's structure conveyor, motors, gear boxes, fluid couplings, drive, pulleys, idlers etc, Conveyor gallery. 1No new bulldozer D-155 and refurbishment of 3nos dozers (D-80A-12,BEML make Hoisting and handling facility, full cord switches, weighing system,. magnetic pulleys separators, transfers chutes, transfer chutes, conveyor short post and gearboxes etc. Electrical System: Rewinding (class-F insulation) of stator of generator & Excitors. Refurbishment of rotor winding, New excitation system. O/H & oil replacement of Generator transformer & UAT. 2 Nos 350kVA & 8 Nos 560 kVA New LT service transformers. 1 No 560 kVA New lighting transformer. Replacement of 6.6 KV unit switch boards (21 Nos.) & LT switchboard 5 Nos. Motors – replacement of 2Nos BFP motors, 2Nos ID fan Motors, 2 nos mill fans Motors, 2Nos ball mills Motors. All other motors to overhauled. LT motors: drain pump motor (2 Nos), SGT motors (1 No), RC feeder motors (12 Nos), Ball mill motors (4 Nos), sump motors (4 Nos). Common Auxiliaries: HP flush water pump motors (2 Nos), Ash disposal pump motors (1No). LP flush water pump motor (2 Nos), fire pump motor (1No), service pump motor (1No). Replacement of Generator protection panel, complete lighting system, power & control cables. New modern 7 loud phones and public address system. Completely replacement of new C&I system. of new C&I system.
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Date of Start Actual	21.7.2003	
5	Actual Date of Completion	30.4.2009	
6	Estimated Cost (Rs in Cr)	Rs. 486.40 Cr. for 5x50 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 186.31 Cr. (On unit 1 & 2)	

The work was awarded to TPE Russia, the contract Between UPRVUNL & TPE was discontinued. The balance of work was completed by U.C.C.I., and ILK.

After Refurbishment works unit – 1 is running at 50 MW load.

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			Completed
1	Name of Power Station	OBRA	i) Boiler : Replacement of Supporting structure-50t 100% Replacement of Refractory & thermal Insulation. 100% Replacement of safety valves, Feed control valves, drain and vent valves - 100%. 100% Replacement of Main steam pipes including bends & fittings. Replacement of Skin casing 300 m ² . 100% Replacement of Furnace Walls, Headers, Down Flow Pipes, riser tubes, Economiser, Platen SH, Conv SH, radiant SH, Ceiling SH, Attemperator, sing rods and supports. O/H of other boiler equipments Air –Pre- Heater: 100% repl. of tube plates, expansion joints Replacement of F.D.Fans (2 Nos), Replacement of I.D.Fan (1 No). 100% replacement of Cold and Hot Air ducts flue Gas Ducts with supports & hanger with insulation, Damper components, Sample coolers, Hot air for mill ducts. Coal Milling & Firing System: Replacement of 2 Nos Raw coal scraper feeder, armor plates, balls, reduction gear of the Mill (2 Nos), coal dust bunker, coal dust feeder, Coal burners, coal dust pipes, mill fans – 100% replacement HFO Guns (6 Nos) - 100% replacement. O/H of oil firing system. ESP: New ESP in place of Mechanical dust collector. 100% replacement of bottom ash handling system, fly ash handling system Ash slurry pumps (3 Nos), Ash slurry pipeline –. New installation of seal water pumps (1 W + 1 S). O/H of HP & LP flush water pump
2	Unit No. & capacity	U-2 (50 MW)	
3	Make		
	i) Boiler	KKBW	
	ii) TG.	LMW	
4	Date of commissioning	03/1968	
B.	RLA Study / Consultancy		
	Description	Boiler	TG.
	Estimated Cost (Rs in Cr)	Included in the cost of R&M works	
	Executing Agency	TPE, Russia	TPE, Russia
			ii) TG : HP & LP casing – repair works. Turbine Rotor with coupling – New Rotor. 100% Replacement of Nozzle Boxes, Nozzle Rings Diaphragms of HP & LP part Repl of last 3 stages ESC, MSV, Condensate, Extraction water pumps, L.P.Heaters, Deaerator, BFP – repair & OH. Replacement of tubes & tube Bundles.. O/H of L.P. Heaters (4 Nos). Complete Replacement of H.P. Heaters (3 Nos). Stud, nuts for casing, control valves - 100% repl. Auxiliary piping. & fitting : Valve below 1” - 100% repl. Other sizes 10 to 50 % .100% Replacement of replacement. Auxiliary piping. O/H of other equipment. Condensate Plant: Replacement of tubes (15 %). Replacement of circulating water pump (2 Nos), CW valves
C	R&M/ LE Works		iii) BOP/ Other works:
1	Executing Agency Boiler/ TG.	TPE, Russia, U.C.C.I. & ILK.	Phosphate dosing pump (1 No) piping, valve & dosing system-100% replacement Replacement of 4 Nos compressors of compressed air system. Installation of new air conditioning plant. One no New fire water pump, Fire detection system, Major O/H of 100T/20T E O T cranes. Replacement of cargo lift. Hoist & Beams for Ball mills, ID fans, feed water tank, ESP, Deatator, CW pump house, DM plant, ash water pump house & ash slurry pump house Replacement of circulating water pump(2 nos) New DM water treatment plant 2x75 m ³ / hr capacity along with clarifloculator of 350 m ³ / hr capacity and replacement of 350 m of 150 MSRL pipe line. O/H of all the equipment/instruments of WTP and raw water intake system. Refurbishment of Wagon tippers, Wagon tippers hoppers, coal crushers (2 Nos), Pusher car, water spray system, Replacement of about 2000 mts of conveyor belts of 1400mm. wide Provision of Dust suppression Extraction system at all transfer points crushers house. Replacement of other core handling equipment like vibrators, conveyor gallery's structure conveyor, motors, gear boxes, fluid couplings, drive, pulleys, idlers etc, Conveyor gallery. 1No new bulldozer D-155 and refurbishment of 3nos dozers (D-80A-12,BEML make Hoisting and handling facility, full cord switches, weighing system,. magnetic pulleys separators, transfers chutes, transfer chutes, conveyor short post and gearboxes etc. Electrical System: Rewinding (class-F insulation) of stator of generator & Excitors. Refurbishment of rotor winding, New excitation system. O/H & oil replacement of Generator transformer & UAT. 2 Nos 350kVA & 8 Nos 560 kVA New LT service transformers. 1 No 560 kVA New lighting transformer. Replacement of 6.6 KV unit switch boards (21 Nos.) & LT switchboard 5 Nos. Motors – replacement of 2Nos BFP motors, 2Nos ID fan Motors, 2 nos mill fans Motors, 2Nos ball mills Motors. All other motors to overhauled. LT motors: All motor overhauled. & ball mill lop motors (4 Nos) replaced. Common Auxiliaries: Already indicated in unit – 1. Completely replacement of new C&I system.
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Actual Date of Start of work	21.7.2003	
5	Date of Completion	05.02.2009	
6	Estimated Cost (Rs in Cr)	Rs. 486.40 Cr. For 5 x 50 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 186.31 Cr on units 1& 2.	

The unit was under forced shutdown since 01.07.1991 and it was almost cannibalized.

After Refurbishment works unit – 2 is running at 50 MW load.

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			LE works completed
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-9 (200 MW) Upgradation to 216 MW	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	01/1980	
B. RLA Study / Consultancy			
Description	Boiler	TG.	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, Tools and tackles for generator for unit 9-13, Rotor and diaphragms lifting device (common for unit 9-13) Spares for commissioning (common for unit 9-13) 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
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	
Actual start of work			
Expected date of Completion			
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	Date of Start (Original)	02.11.2008	
5	Expected Date of Completion	17.09. 2010 (Unit is under stabilization.	
6	Estimated Cost (Rs in Cr)	Rs 1635 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 942 Cr (On unit 9-13)	

- **During stabilization two failures occurred on 15th & 31st Oct. 2010. Turbine reopened in Nov.'10 for identification and rectification of problem. Expected date of resynchronization is Sept., 2011 as per BHEL commitment.**
- **Unit synchronized on 28.06.2011. BHEL suggested UPRVUNL to operate the unit 150-160 MW.**

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

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) 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.
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)	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
Executing Agency		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	After Stabilization of unit-9. Expected date of start of work Oct.', 2011.	
5	Expected date of Completion of work		
6	Estimated Cost (Rs in Cr)	Rs 1635 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 942 Cr (On unit 9-13)	

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

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) 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)	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
	Executing Agency	BHEL BHEL	
	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	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.
2	No. of Activities Boiler/ TG.		
3	Zero date	20.6.2006	
4	Date of Start of work	10.07.2011	
5	Expected date of Completion of work		
6	Estimated Cost (Rs in Cr)	Rs 1635 crores for units (9 to 13)	
7	Actual Expenditure incurred (Rs in Cr)	Rs 942 Cr (On unit 9-13)	

Dismantling of boiler started.

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

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

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-12 (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-generative Area
	Executing Agency	BHEL BHEL	
	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	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 1635 crores for units (9 to 13) 5x200 MW units.	
7	Actual Expenditure incurred (Rs in Cr)	Rs 942 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 30.06.2011)

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.
	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 (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 :
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 work	*	
5	Expected date of Completion of work		
6	Estimated Cost (Rs in Cr)	Rs 1635 crores for units (9 to 13)	
7	Actual Expenditure incurred (Rs in Cr)	Rs 942 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 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			Completed
1	Name of Power Station	OBRA	i) Boiler : Replacement of boiler pressure parts, tubes, coils & Headers with clamping. Replacement of top, middle, bottom Air blocks. Replacement of MPS & EPS with new ESP along with Fly ash handling system. Renovation of Ball Mills(repl of ream gear, pinion gear, middle pinion shaft, reduction gear assly, couplings, modification of ball mill internals, reduction gear foundation (3 nos/set each). Replacement of HP Valves and lines (LP drain, air vent, gate valve/ stop valve, Replacement of complete skin casing, structure, sealing of pent house, hot air, cold air & flue gas ducting., skin casing of slag hoppers. Replacement of coal burner assembly – 20 Nos, vapor burner assembly – 12 Nos, slag crusher coal burner assembly – 5 Nos Refractory and Re-insulation of feed line, down comers main steam lines, bottom headers, complete water walls pent house, false sealing and other parts of boiler and auxiliaries. Coal dust system-Replacement of compressors, RC & PC feeders, pipelines, bends etc.
2	Unit No. & capacity	U-6 (94/100 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	05/1978	
B.	RLA Study / Consultancy		
	Description	Boiler	TG.
	Estimated Cost (Rs in Cr)		21 lakhs (include d)
	Executing Agency		BHEL
	Actual start of work		
	Completion date		
	Actual Expenditure (Rs in Cr)		
			ii) TG : Major O/H of turbine, repair of HP rotor & , LP rotor. Replacement of diaphragms of second and third stage of HP cylinder, gland seal box, sealing rings, studs, cap nuts etc. Repairing of HP rotor tesion heads and replacement of warn out shrouds. Replacement of 12 blades of 30 th stage and 6 blades of 25 th stage with repl of satellite strip of blades of last stage followed by slow speed balancing. Procurement and replacement sealing rings studs cap nuts etc. of turbine. Procurement and replacement of new diaphragms 2 nd & 3 rd stage of HP cylinder of turbine.Procurement and replacement of Gland Seal box. Remetallisation & replacement of T G bearing. Replacement of liners of control valves & changing of valves stem and seat of control valves. Reinsulation of turbine, pipelines and dearators. Procurement and replacement of condenser tubes, gaskets. Retubing of L.P.H 2 & 4. O/H and maintenance of auxiliaries of Turbine

C	R&M/ LE Works		iii) BOP :
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Date of Start (Original/Expected/Actual)		
5	Date of Actual Completion	18.3.2008	
6	Estimated Cost (Rs in Cr)	Rs 52.47 Cr	
7	Actual Expenditure incurred (Rs in Cr)	Rs 52.47 Cr	

Unit-6 is running at 76 MW after R&M works

* The status incorporated updated as per Chief Engineer (R&M), UPRVUNL, Lucknow letter dated on 13.01.2010.

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

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.
2	No. of Activities Boiler/ TG.			BOP works for almost complete power station.
3	Zero date			
4	Date of Start of work	March, 2011		
5	Expected Date of Completion	June,2012		
6	Estimated Cost (Rs in Cr)	Rs 290.0 Cr		
7	Actual Expenditure incurred (Rs in Cr)	Advance payment has been made		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.

95% dismantling completed

Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 30.06.2011)

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	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. 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 pimps (4 Nos), degasser pumps (4 Nos), degasser blowers (2 Nos), acid & alkali dozing 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
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 444.90 Cr including Taxes & duties, freight & Insurance (for 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 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 30.06.2011)

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 444.90 Cr including Taxes & duties, freight & Insurance (for 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 consultant has submitted the report which shall be examined by UPRVUNL authority in July-August' 2010.

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 30.06.2011)

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. After dismantlement work of Boiler, erection work of Boiler started from 18.06.2010.
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. 10% erection works of Turbine and Auxiliary and 10% civil works of Boiler, Turbine and BOP completed.
	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 Date of Completion of work	November, 2011	
6	Estimated Cost (Rs in Cr)	483.95 Cr. For U-3 & 4	
7	Actual Expenditure incurred (Rs in Cr)	212 Cr.	

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. Expected to be recommissioned by November, 2011.**

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

(As on 30.06.2011)

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 commissioning	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		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	Expected Date of Start of work	January, 2012	
5	Expected Date of Completion of work	September, 2012	
6	Estimated Cost (Rs in Cr)	483.95 Cr. For U-3 & 4	
7	Actual Expenditure incurred (Rs in Cr)	212 Cr.	

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 3, expected to be recommissioned by Nov, 2011 and thereafter shut down of Unit 4 will be taken up.

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

(As on 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			Order yet to be Placed
1	Name of Power Station	GGSTPS, Ropar	i) Boiler :
2	Unit No. & capacity	U-1 (210 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	26.9.84	

B.	RLA Study / Consultancy	NTPC has been appointed for consultancy works for units – 1 & 2), Rs 9.00 Cr. have been charged by NTPC for consultancy works)	
	Description	Boiler	TG.
	Estimated Cost (Rs in Cr)	4.7373 Cr	
	Executing Agency	M/s Evonik Energy services (India Pvt Ltd)	
	Actual start of work	1.1.2006	
	Completion date	4.7.2009	
	Actual Expenditure (Rs in Cr)	Rs.4.23 Cr (Work) + Rs 3.07 Cr (consultancy)	
		ii) TG :	

C	R&M/ LE Works	BOP :	
1	Executing Agency Boiler/ TG.	Not yet finalised	
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Expected date of Start of work.	Not yet finalised	
5	Expected date of Completion of work.	Not yet finalised	
6	Estimated Cost (Rs in Cr)	Rs 774.69 Crores (For Units 1 & 2)	
7	Actual Expenditure incurred (Rs in Cr)		
		Detailed Project Report (DPR) finalized, The detailed project report for carrying out R&M and I.E. works submitted to Board for approval.	

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

(As on 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			Order Placed
1	Name of Power Station	GGSTPS, Ropar	i) Boiler :
2	Unit No. & capacity	U-2 (210 MW)	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	29.3.85	

B.	RLA Study / Consultancy		ii) TG :	
Description		Boiler		TG.
Estimated Cost (Rs in Cr)				
Executing Agency		M/s Evonik Energy services (India Pvt Ltd)		
Actual start of work		1.1.2006		
Actual date of Completion		4.7.2009		
Actual Expenditure (Rs in Cr)		Rs.4.23 Cr (Work) + Rs 3.07 Cr (consultancy)		

C	R&M/ LE Works		BOP :
1	Executing Agency Boiler/ TG.	Not yet finalised	Detailed Project Report (DPR) finalized, The detailed project report for carrying out R&M and I.E. works submitted to Board for approval.
2	No. of Activities Boiler/ TG.	Not yet finalised	
3	Zero date		
4	Expected Date Start of work	Not yet finalised	
5	Expected date of Completion of work	Not yet finalised	
6	Estimated Cost (Rs in Cr)	Rs 774.69 Crores (For Units 1 & 2)	
7	Actual Expenditure incurred (Rs in Cr)		

Status of LE works of Haryana (HPGCL) Thermal Power Station (As on 30.06.2011)

A	Project Details	Description	Broad Scope of Works
			Completed
1	Name of Power Station	Panipat	i) Boiler : Material required for replacement of economizer tubes, water wall up to 37M , buck stage, front and rear side steam cooled wall, ceiling super heater LTSH, platen SH and final SH, reheater, suit blowing system, SH/RH spray control valve, feed control valves, additional oil elevation, furnace insulation, refurbishment of critical piping and replacement of Russian type actuators etc.
2	Unit No. & capacity	Unit-1 Upgrading 110 MW to 117.8 MW	
3	Make		
	i) Boiler	BHEL	
	ii) TG.	BHEL	
4	Date of commissioning	03/1979	
B.	RLA Study / Consultancy		
	Description	Boiler TG.	ii) TG : Turbine, Generator and Auxiliaries :- Material required for uprating of turbine to 117.8 MW by modification of inner casing rotor of impulse type HP IP and LP turbines to suit reaction type of blading, provision of additional HP elevation valves, HP/LP seal steam valves, barring gear system etc. Re-coring and rewinding of Generator stator, rewinding of rotor, replacement of static excitation system, diaphragm valves and regulating valves etc. Replacement of HP heater 1 & 2 and LP heater 1 & 2, hydrogen coolers, level control valves, actuators, overhauling of BFW hydraulic couplings with modified cartridge and other pumps and motors, replacement of valves, critical piping insulation etc.
	Estimated Cost (Rs in Cr)	Included in refurbishment works	
	Executing Agency	BHEL BHEL	
	Actual start of work	Carried out during S/D for refurbishment works	
	Completion date	Completed during S/D for refurbishment works	
	Actual Expenditure (Rs in Cr)	Included in uprating works	
C	R&M/ LE Works		iii) BOP : Refurbishment/ Augmentation of Fuel oil handling system, ash handling plant, Overhauling of CW/BCW system, provision of new compressors, debris filter and on line tube cleaning system, Refurbishment of air conditioning ventilation system with additional 2x20 Ton AC. Refurbishment of fire fighting system, overhauling of DM plant, servicing of 6.6 KV switchgear, HT & LT motors, refurbishment of old cables etc. Control & Instrumentation :- Material required for replacement of old C&I system for boiler and turbine with Max-DNA microprocessor based electronic system and man machine interface, replacement of regulating actuators for auto loops in boiler and turbine control, UPS and batteries enunciation system, suit blowing system, FSSS, SADC and turbo-visory system etc. Control & Instrumentation :- Material required for replacement of old C&I system for boiler and turbine with Max-DNA microprocessor based electronic system and man machine interface, replacement of regulating actuators for auto loops in boiler and turbine control, UPS and batteries enunciation system, suit blowing system, FSSS, SADC and turbo-visory system etc.
1	Executing Agency Boiler/ TG.	BHEL	
2	No. of Activities Boiler/ TG.		
3	Zero date		
4	Actual date of Start	25.9.07	
5	Actual date of Completion of work	04.11.08	
6	Estimated Cost (Rs in Cr)	Ex-work Rs 104 Crores + Ex-work price for service Rs 16 Crores	
7	Actual Expenditure incurred (Rs in Cr)		

Western Region

(Unit wise Broad Status of LE works)

STATUS OF LE WORKS OF GUJRAT (GSECL) THERMAL POWER STATION

(As on 30.06.2011)

	PROJECT DETAILS	DESCRIPTION	Major works carried out during LE Works	
1	Power Station	Ukai TPS	Completed	
2	Unit No. & capacity	U-1, 120MW		
3	Make			
	i) Boiler	BHEL		
	ii)TG:	BHEL		
4	Date of Commissioning	19.03.1976		
B RLA Studies / Consultancy			a) Boiler : (1) Repair/replacement of water wall , Platen SH, final SH, final RH header, final RH coils (56 Nos) , primary RH coils (94 Nos) , Hanger support. (2) Replacement of Economizer. (3)Replacement/repair RH/SH de-superheating system, penthouse. (4) Installation of HEA igniter assembly, repair/replacement of Duct & Dampers, Soot blower, Erection of New ID fan, Overhauling of FD & PA fan. (5) Replacement of Tubular Air preheater. (6) ESP–Modification & addition of 2 new fields. (7) Servicing of coal mills, replacement of worn-out parts (8)Installation of Gravimetric coal feeder. (9) Boiler Instrumentation modification. b) TG: (1) Replacement of stator winding with-F class insulation (2) Replacement of TG bearings from 1 to 7. (3) Replacement of Hydrogen sealing rings. (4) Repairing of IP casings. (5) Replacement of HP/IP rotors. (6) Repairing of LP rotors. (7) Servicing of modified steam chest. (8) C& I work & Turbovisory fittings. (9) Complete replacement of C&I system by DDCMIS. (10) Retrofitting of BFP with new design BFP Carridge. c) C&I /Other works (if any): 1) CHP (2) AHP (Ash Handling Plant), (3) Raw water & cooling water system, ACW & BCW (4) Fire fighting & detection system, Crane & hoists (5)Water treatment plant (O/H of clarificator and DM water plant) (6) Fuel oil handling system & LDO transfer and unloading pump O/H work (7) Compressed Air System. (8) AC & Ventilation system. (9) Servicing of GT, ST , HT, & LT motors, LT Auxilliary Transformer, Breaker & Isolators, 415 V MCC & Switchgear. (10) Replacement of 6.6 KV (MOCB) by VCB.	
	Descrip- tion	Boiler		TG
1	Estimated Cost (Rs.Cr.)	Cost included in LE work		
2	Executing Agency	BHEL		BHEL
3	Exp / Act Start date	18.09.2003		
4	Comple-tion date	31.01.2004		
5	Actual Exp. (Rs.Cr.)	142.5 Lakhs		
C	R&M / LE works			
1	Estimated cost (Rs. Cr.)	260 (for unit 1&2 incl RLA studies)		
2	Executing Agency : Boiler/ TG	BHEL / BHEL		
3	No. of activities : Boiler / TG	169 including BOP		
4	Date of start / completion (E/A)	06.09.2006(A) 24.5.2008 (A)		
5	Actual Expenditure incurred (Rs. Cr.)	245.90 (for U1&2 incl RLA)		

Note: Unit is restricted to operate at 100-110 MW against rated capacity of 120MW due to high generator vibration. Inspite of assurance by BHEL during meeting held in MOP on 18.11.10 to arrange meeting between GSECL & BHEL(Hyderabad) for deciding course of action for proper balancing by 30.11.10, the same has not been done so far as informed by GSECL. Performance Guarantee Test (PGT) yet to be conducted by BHEL.

STATUS OF LE WORKS OF GUJRAT (GSECL) THERMAL POWER STATION

(As on 30.06.2011)

A	PROJECT DETAILS		DESCRIP-TION	Major works carried out during Ukai R&M/LE
1	Name of Power Station		Ukai TPS	Completed
2	Unit No. & capacity		U-2, 120MW	
3	Make			
	i) Boiler		BHEL	
	ii)TG:		BHEL	
4	Date of Commissioning		23.6.1976	
B	RLA Studies / Consultancy			a) Boiler : (1) Repair/replacement of water wall , Platen SH, final SH, final RH header, final RH coils (56 Nos) , primary RH coils (94 Nos) , Hanger support. (2) Replacement of Economizer. (3)Replacement/repair RH/SH de-superheating system, penthouse. (4)Installation of HEA igniter assembly, repair/replacement of Duct & Dampers, Soot blower, Erection of New ID fan, Overhauling of FD & PA fan. (5) Replacement of Tubular Air preheater. (6) ESP–Modification & addition of 2 new fields. (7) Servicing of coal mills, replacement of worn-out parts (8)Installation of Gravimetric coal feeder. (9) Boiler Instrumentation modification. b) TG: (1) Replacement of stator winding with-F class insulation (2) Replacement of TG bearings from 1 to 7. (3) Replacement of Hydrogen sealing rings. (4) Repairing of IP casings. (5) Replacement of HP/IP rotors. (6) Repairing of LP rotors. (7) Servicing of modified steam chest. (8) C& I work & Turbovisory fittings. (9) Complete replacement of C&I system by DDCMIS. (10) Retrofitting of BFP with new design BFP Carriage. c) C&I /Other works (if any): 1) CHP (2) AHP (Ash Handling Plant), (3) Raw water & cooling water system, ACW & BCW (4) Fire fighting & detection system, Crane & hoists (5)Water treatment plant (O/H of clarificator and DM water plant) (6) Fuel oil handling system & LDO transfer and unloading pump O/H work (7) Compressed Air System. (8) AC & Ventilation system. (9) Servicing of GT, ST , HT, & LT motors, LT Auxilliary Transformer, Breaker & Isolators, 415 V MCC & Switchgear. (10) Replacement of 6.6 KV (MOCB) by VCB.
	Description	Boiler	TG	
1	Estimated Cost (Rs.Cr.)	Cost included in LE work		
2	Executing Agency	BHEL	BHEL	
3	Exp / Act Start date	20.03.2003		
4	Comple-tion date	30.04.2003		
5	Actual Exp. (Rs.Cr.)	142.5 Lakhs		
C	R&M / LE works			
1	Estimated cost (Rs. Cr.)	260 (for unit 1&2 incl RLA studies)		
2	Executing Agency : Boiler/ TG	BHEL /BHEL		
3	No. of activities : Boiler / TG	169 including BOP		
4	Date of start / completion (E/A)	12.8.2008(A) 24.02.10(A)		
5	Actual Expenditure incurred (Rs. Cr.)	245.90 (for U1&2 incl RLA)		

Note: Unit is restricted to about 100-110 MW only. GSECL, Badodra has informed telephonically that unit no. 2 is being taken for shut down for 25 days w.e.f. 12.7.2011 for turbine related work and BHEL has been requested to carry out PG test during this period.

STATUS OF LE WORKS OF GUJRAT (GSECL) THERMAL POWER STATION

(As on 30.06.2011)

A	PROJECT DETAILS		DESCRIP-TION		BROAD STATUS OF VARIOUS ACTIVITIES	
1	Name of Power Station		Gandhinagar TPS		Supply Started. (A) Main Plant Auxiliaries: (Boiler/ TG / C&I/ Electricals and Switchyard) : - Order awarded to M/s BHEL on 12.10.06 / 28.05. 2007. 70% - 80% of Design & Engineering completed. 55% - 60% of materials for unit no. 1 and 2 have been received. - Due to poor work performance of R&M/LE works and excessive time taken by BHEL at Ukai TPS resulting in loss to GSECL. GSECL management has decided to discontinue all the activities for R&M/LE works of Gandhinagar TPS unit Nos. 1&2 (2x120MW). Accordingly BHEL have been informed to stop all the related activities for R&M/LE works of Gandhinagar unit nos. 1&2 (2x120MW).	
2	Unit No. & capacity		1 & 2 (2x120 MW)			
3	Make : Boiler / TG		BHEL / BHEL			
4	Date of Commissioning		U-1: 13.3.1977 U-2: 23.3.1977			
B	RLA Studies / Consultancy					
	Descrip-tion	RLA study of Main Plant (Boiler, TG, C&I, Elec, S/Y) and BOP	Providing Consultancy for RLA Study and R&M/LE works for Main Plant (Boiler, TG,C&I, Elec, S/Y) and BOP			
1	Estimated Cost (Rs.Cr.)	Rs. 1.8 Cr. for both the units	Rs. 8.4 Cr. for both the units			
2	Executing Agency	M/s PPIL, New Delhi	M/s NTPC, Noida			
3	Exp / Act Start date	Shut down date of Unit No. 2 : 30.09.2003 to 28.03.2004	01.04.2000 (Starting of Consultancy works)			
4	Comple-tion date	13.07.2005	24.03.2010			
5	Actual Exp. (Rs.Cr.)	1.62 Cr. for both units 1&2.	4.03 Cr. for both units (considering invoices up to June-2009)			
C	R&M / LE works for Main Plant Auxiliaries and BOP					
	Description	Main Plant: (Boiler/ TG/C&I)	BOP	TOTAL		
1	Estimated cost (Rs. Cr.)	Rs 361 Cr.	Rs 60 Cr.	Rs. 421* Cr.		
2	Executing Agency : Boiler/ TG	BHEL New Delhi	Differe nt Agenci es	--		
3	No. of activities : Boiler / TG	216 Nos.	20 Nos.	236 Nos.		
					(B) BOP /Other works (if any): All the activities for BOP have also been stopped except four nos. of BOP packages where orders have been placed (Rs. 13.6276 Crores) and works for which were under process. The present status for these four nos. of BOP Packages is as under:	
					Sl No	Name of BOP Packages/Ord ered value
					1.	O/H of CHP (Mech) LOI/detailed order issued to M/s Elecon Engg. Comp. Ltd. Vallabh Vidhyanagar on 20.05.09/27.07.09. About 300 tonnes of material is received.
					2.	O/H of Air Washing unit & ventilation system. LOI/Order issued to M/s Calvin Engg. Ahmadabad on 07.07.07/11.08.09. Unit-1: Ducting/Cooling system works comp. except installation of CWP. Unit-2:Ducting/Cooling system works 90% comp. except installation of CWP.
					3.	O/H of Transformers LOI/Order issued to M/s Dalvi Transformers and Services, Vadodara on 30.05.09/21.07.09. Unit-1: 80% works comp. Unit-2 : Comp.
					4.	O/H of cooling tower (civil work) LOI/Order to M/s Standard Builders, Neyveli is issued on 12.06.09/04.08.09. Unit-1: Comp. except epoxy painting of 1500 m ² . Unit-2 : Comp.

4	Date of start / completion (E/A)	GSECL informed CEA in May, 2010 that due to non satisfactory performance of R&M-cum-LE works by M/s BHEL at Ukai TPS unit 1&2, GSECL has decided to amicably short close Gandhinagar unit 1&2 R&M works contract. However, CEA vide letter dated 16/18 June, 2010 opined GSECL that Gandhinagar R&M and Ukai R&M are two separate contracts, discussed and negotiated separately at different periods of time and two contracts should not be linked with each other and therefore should be dealt separately. However, GSECL vide their letter dated 01.7.2010 reiterated their earlier stand that they can not agree for carrying R&M works for Gandhinagar unit no. 1&2. Managing Director (GSECL) in an informal meeting with Chairperson, CEA on 30.09.2010, again reiterated their earlier stand and informed that they intended to replace existing coal based thermal power plant at Gandhinagar with gas based power plant in view of the environmental compulsion and they would be conveying the decision taken in the matter at higher level to CEA.		
5	Actual Expenditure incurred (Rs. Cr.)	Rs. 142.72 Cr.	Rs. 10.67 Cr	Rs. 157.42** Cr.

- * Exp. excluding Consultancy Charges ie Rs. 8.40 Crores.
- **Exp. including Consultancy Charges ie Rs. 4.03 Crores

Note : M/s GSECL mentioned that the matter regarding R&M/LE of Gandhinagar TPS units 1&2 (2x120MW) need not be pursued as per decision of Govt. of Gujarat, GSECL intended to replace existing coal based thermal power plant at Gandhinagar with gas based power plant.

STATUS OF LE WORKS OF MADHYA PRADESH (MPPGCL) THERMAL POWER STATION

(As on 30.06.2011)

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Note : S/d of U-1 was taken from 26.09.10 for LE works. Likely completion in Sept./Oct, 2011.

STATUS OF LE WORKS OF MADHYA PRADESH (MPPGCL) THERMAL POWER STATION
(As on 30.06.2011)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Amarkantak Ext. TPS	Completed a) Boiler: Following works have completed during 2006-08. i. Replacement of boiler pressure parts. ii. Replacement of Dampers and Actuators iii. Replacement of Fabric Expansion Joints iv. Replacement of one no. ash slurry pump motor set. v. Replacement of valves and pipings. vi. Renovation of Mills. The R&M works of Air Heaters in unit no.2 is completed during COH in the year 2009-10.
2	Unit No. & capacity		U-2 (120 MW)	
3	Make : Boiler/TG		AVB / BHEL	
4	Date of Commissioning		U-2: 31.3.1978	
B	RLA Studies / Consultancy			b) TG : Order for R&M works of turbine-Generator and its auxiliaries placed on M/s NASL. Supply is almost completed. The renovation work in unit no. 2 has been commenced from 26.7.09 and will be completed by July 2010. c) BOP : The following R&M works of Electrical Equipments and C&I have been completed during 2004-06: i. Replacement of relays. ii. Replacement of 4 nos. 220 KV MOCBs by SF-6 breakers iii. Replacement of 8 nos. LT transformers by Dry Type transformers. iv. Retrofitting / replacement of 415 V switchgears / MCCs/ DBs. v. Retrofitting / replacement of 6.6. KV switch gears. vi. R&M works of C&I equipments. ** Unit is giving an output of 100-105 MW.
	Description	Boiler	TG	
1	Estimated Cost (Rs.Cr.)	Cost included in R&M/LE works.		
2	Executing Agency	Various agencies	NASL	
3	Expected / Act Start date			
4	Expected / Act Completion date			
5	Actual Expenditure. (Rs.Cr.)			
C	R&M / LE works			
1	Estimated cost (Rs. Cr.) (for unit 1&2)	Rs. 124.03 Cr. (for R&M of Boilers, Elect. C&I and TG works) Out of which BTG 59.79 Cr pertains to TG & associated Auxiliaries.		
2	Executing Agency : Boiler/ TG	M/s NASL- TG package		
3	No. of activities : Boiler / TG			
4	Date of start / completion (E/A)	26.07.09 (A) / 26.8.2010 (A)**		
5	Actual Expenditure incurred (Rs. Cr.) (for unit 1&2) up to 31.03.10	Rs. 62 Cr.(approx.) on R&M of Boilers, Elect and C&I +Rs 39 Crs.on TG.(Total-Rs 101 Crs.)		

Eastern Region

(Unit wise Broad Status of LE works)

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

(As on 30.06.2011)

Project details		Description		Broad status of various activities
A				
1	Name of Power Station	Barauni TPS		Ongoing. About 83% Boiler materials reached at site. As proposed by BHEL, In the first phase of R&M, the restoration of BOP has also been done by BHEL and is running at 70-75 MW load.
2	Unit No. & capacity	U-6 ,110MW		
3	Make	BHEL/ BHEL		
4	Date of Commissioning	U# 6-01.05.1983		
B	RLA Studies / Consultancy			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 In the first phase of R&M, the restoration work of TG-Set has been completed by BHEL and the unit no. 6 is running at a load of 70-75 MW. 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.
	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.)	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 June' 2012.		
5	Actual Expenditure incurred (Rs. Cr.)	Restoration cost –Rs. 49.90 cr. Consultancy charge- Rs. 7.74 Cr.		

***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. As per BHEL commitment in meeting with Chief Secretary, Bihar on 24.01.2011, the commissioning schedule of Unit 6&7 is Oct., 2012 and March, 2012 respectively.**

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

(As on 30.06.2011)

A	Project details	Description		Broad status of various activities
1	Name of Power Station	Barauni TPS		About 83% Boiler materials reached at site. As proposed by BHEL, anticipated date of synchronization is 31 st March, 2012.
2	Unit No. & capacity	U- 7, 110MW		
3	Make : Boiler/ TG	BHEL/ BHEL		
4	Date of Commissioning	U# 7-31.03.1985		
B	RLA Studies / Consultancy			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 Boiler & Turbine – Dismantling and Erection works – Agency mobilized at site on 07.03.2011 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 Dismantling of Turbine of U-7 completed, HP rotor is sent to BHEL, (Hyd.) but machining has not been started. LP rotor dispatched to BHEL works 22.02.2011. Order for IP rotor forging has been awarded to Shanghai Machining Corporation by BHEL. All three rotors shall reach Barauni site by Aug.'2011 as committed by BHEL. 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. Civil works of Mills & ESP, CHP works, AC & Ventilation system and cooling water system has not been started.
	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.)	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 Nov.' 2011.		
5	Actual Expenditure incurred (Rs. Cr.)	239 Cr.		

Note : As per BHEL commitment in meeting with Chief Secretary, Bihar on 24.01.2011, the commissioning schedule of Unit 6&7 is Oct., 2012 and March, 2012 respectively.

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

(As on 30.06.2011)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Muzaffarpur TPS	About 76% Boiler materials reached at site and about 32% Boiler erection works completed.
2	Unit No. & capacity		U-1,110MW	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 Boiler erection works started on 31.12.10. 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. As proposed by BHEL to meet synchronization of unit 1 by 30.11.2011, the following milestones have been targeted as under. - Hydrotest by 31.7.2011 - Boiler light up by 15.9.2011 - Turbine boxup by 15.10.2011
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 June' 2011	
5	Actual Expenditure incurred (Rs. Cr.)		355 Cr. (Incd Restoration of Unit-2	

Note : As per BHEL commitment in meeting with Chief Secretary, Bihar on 24.01.2011, the commissioning schedule of Unit 1&2 is 30.11.2011& 15.08. 2012 respectively.

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

(As on 30.06.2011)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Muzaffarpur TPS	On-Going.Partly restored during restoration of unit -2 and is running at 80-90 MW on sustainable basis.
2	Unit No. & capacity		U-2,110MW	
	Make		BHEL/BHEL	
4	Date of Commissioning		17.03.1986	
B	RLA Studies / Consultancy			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.
	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 April’ 2012	
5	Actual Expenditure incurred (Rs. Cr.)		56.8 (for unit @ 2 restoration)& BOP (partly)	

***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. As per BHEL commitment in meeting with Chief Secretary, Bihar on 24.01.2011, the commissioning schedule of Unit 1&2 is 30.11.2011& 15.08.2012 respectively.**

STATUS OF LE WORKS OF WEST BENGAL (WBPDC) THERMAL POWER STATION
(As on 30.06.2011)

A	Project details		Description	Broad status of various activities
1	Name of Power Station		Bandel	WBPDC has taken a decision for rebidding. Main Plant Package(B-T-G) International Competitive Bidding in accordance with IBRD's Two Stage bidding procedure has been adopted. 1 st Stage Bid evaluated and evaluation report submitted to World Bank. Due to lack of more than one qualified bidders for 2 nd stage bid WBPDC has taken a decision for retendering. NIT for rebidding has been floated and last date for submission of the bid is 22.03.2011. Two bids were received. Bid evaluation report has been sent to World Bank in the first week of May, 2011 for their 'No Objection. For other remaining three packages, finalization of Technical & Commercial specifications are in process.
2	Unit No. & capacity		U-5 , 210MW	
3	Make : Boiler/TG		AVB/BHEL	
4	Date of Commissioning		23/03/1983	
B	RLA Studies / Consultancy			
	Description	Boiler	TG	Electrical System Package, Coal Handling Package & Ash Handling Package – : Finalization of technical specification is in process.
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.478 Cr. (Loan, 335 Cr + Equity, 143 Cr.)			
1	Total No. of package	4 (four) – BTG, CHP, Electrical & AHP.		
2	Executing Agency : BTG package	Yet to be finalized.		
3	Zero date			
4	Date of start (Original/ Expected /Actual)	Expected Date of start-May,2011		
5	Date of completion (Original/ Expected /Actual)	Yet to be finalized.		
6	Actual Expenditure incurred (Rs. Cr.)	*		

*Till date, payment made to three consultancy services only for preparing DPR & tender document. All these charges were funded by PHRD Grant.

