



भारत सरकार

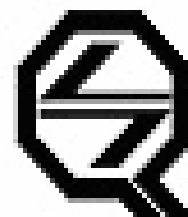
GOVERNMENT OF INDIA

केंद्रीय विद्युत प्राधिकरण

Central Electricity Authority

ताप विद्युत नवीनीकरण एवं आधुनिकीकरण

Thermal Renovation and Modernisation Division



TG of Unchahar TPS Unit 1

**Quarterly Review Report**  
**Renovation, Modernisation and Life Extension of**  
**Thermal Power Stations**  
**{4<sup>th</sup> Quarter of 2012-13, (January – March, 2013) during 12<sup>th</sup> Plan}**

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## **Foreword**

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

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

The R&M works at DPL TPS unit-6 (110 MW) and Patratu TPS unit -10 (110 MW) has been completed during Ist Quarter of 2012-13. Synchronization of Bhatinda TPS unit -3 (110 MW) after LE works and Tanda Unit -2 (110 MW) after R&M has been completed during 2<sup>nd</sup> Quarter of 2012-13. LE works on Kawas GT-1A (106 MW) have been completed in 3<sup>rd</sup> Quarter. R&M works completed in Anpara 'A' (3x210 MW) during the 4<sup>th</sup> Quarter. In order to carry out R&M/LE works, Bathinda TPS Unit - 4 (110 MW), Barauni TPS Unit - 6&7 (2x110 MW), Muzaffarpur TPS Unit - 1&2 (2x110 MW), Harduaganj TPS Unit -7 (110MW), Obra TPS Unit 7,10 & 11 (1x100+2x200 MW), Patratu TPS Unit 9 (110 MW) and Parichha TPS unit 2 (110 MW) were under shut down and works are under progress on the above mentioned thermal units.

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

Under Indo-German Energy Forum (IGEF), Phase-II activity, M/s Lahmeyer International (India) Ltd. has been appointed as a consultant and the contract was signed on 16.03.2012 between CEA and M/s Lahmeyer to provide the consultancy services for 'Development of Tendering Procedures and Model Contract document for R&M of Fossil Fuel Based Power Plants in India'. The project is funded by KfW Bank/Germany. M/s Lahmeyer has submitted the draft Model Feasibility Report for R&M projects in December 2012. And the other documents are being prepared by M/s Lahmeyer.

The World Bank is providing Technical Assistance to CEA of US \$ 1.1 million as a part of GEF grant under "Coal Fired Generation Rehabilitation Project -India" for addressing barriers to Energy Efficiency R&M in India. M/s. ABPS Infrastructure Advisory Services Ltd., is working as ISC (Implementation Support Consultant) to assist CEA for implementing the project under title 'Technical Assistance to CEA'. Few draft reports have been submitted the details are furnished in para 8.3.2.

The 2<sup>nd</sup> MOU between CEA and JCOAL has been signed on 11.06.2012 for carrying out diagnosis activity for the project on efficiency and environmental improvement of coal fired power stations. Accordingly, Unit no. 4 of Durgapur TPS of DVC and one unit each from Badarpur TPS St.-II and Unchahar St-I of NTPC have been identified for studies by the JCOAL team. JCOAL team visited these stations during December, 2012 and draft report submitted in 2<sup>nd</sup> week of March'2013.

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

नई दिल्ली  
दिनांक : 22.04.2013

(तेजिंद्र पाल सिंह)  
मुख्य अभियन्ता

## Highlights

### 1. LE/ R&M Achievements during 11<sup>th</sup> Plan (2007 – 2012)

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

### 2. LE / R&M Programme during 12<sup>th</sup> Plan (2012 - 2017)

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

### 3. Important Achievements of R&M and LE Projects during 2012-13 (upto 31.03.2013)

LE - 2 Unit (216 MW)

R&M - 6 Units (960 MW)

Total (LE and R&M) - 8 Units (1176 MW)

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

The status of activities under external cooperation for R&M/LE of TPS is furnished below (as on 31.03.2013) :-

#### (A) KfW funded Programme

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

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

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

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

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

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

The final DPRs have been prepared and sent to DVC in March 2012. The acceptance of DPRs by DVC is awaited.

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

M/s Lahmeyer International (India) Ltd. has been appointed as a Consultant wef 16-03-2012 to provide the consultancy services for 'Development of Tendering Procedures and Model Contract document for R&M of Fossil Fuel Based Power Plants in India'. M/s Lahmeyer has submitted the draft Model Feasibility Report for R&M projects in December 2012. And the other documents are being prepared by M/s Lahmeyer.

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

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 Technical Assistance to CEA project is being implemented by CEA through appointment of consultants for carrying out various studies related to R&M of thermal power stations. All the consultants for carrying out various studies under the above project have been appointed.

M/s Mercados Energy Market India has been appointed as a Consultant for "Study on Reduction of Barriers to R&M Interventions in TPS in India" and also for the "Study on Developing Markets for Implementation of R&M in TPS in India". M/s KPMG has been appointed as a Consultant w.e.f. 16-07-2012 for the consultancy services "Review of Institutional Capacity and Capacity Strengthening Interventions in CEA". M/s WAPCOS Ltd. has been appointed as a Consultant for the study "Review of Experience from Pilot R&M Interventions in TPS in India" wef 23-07-2012. The draft guidelines for Risk Identification & Mitigation measures in R&M projects' and 'Early identification of potential technical surprises & way of addressing them' have been prepared.

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

The 2<sup>nd</sup> Phase MOU between CEA and JCOAL has been signed on 11.06.2012 for carrying out detail diagnostic study for energy efficiency oriented R&M activities in three nos. of units at various thermal power plant viz Durgapur TPS of DVC, Unchahar & Badarpur TPS on NTPC. A kick-off meeting at the above stations were held in October 2012 and JCOAL team visited these stations during December, 2012 for studies. A workshop was held on 27.11.2012 on "Project on Efficiency and Environmental Improvement of Coal Fired Power Stations – Towards sustainable, stable and low carbon supply of electricity. A draft report for carrying out study for energy efficiency oriented R&M activities was submitted in the 2<sup>nd</sup> week of March, 2013 during de-briefing meeting at respective utility.

**(D) JICA Study on Renovation & Modernization / Complete Replacement of State Sector old inefficient coal based thermal power station in India.**

A study on renovation & modernization / complete replacement of state sector old inefficient coal based thermal power station in India was undertaken by JICA under directives of Government of India covering the state sector power station viz. Obra A TPS Unit No. 1 to 8 (U.P), Satpura TPS Unit No. 1 to 5 (M.P), Bhusawal TPS Unit No. 2 & 3 (Maharashtra) and Parli TPS Unit No. 3 to 5 (Maharashtra). Final Report of their observation has been submitted by JICA on 21.06.2012.

# **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 31.03.2013 was 223343.6 MW of which thermal power plants contributed 151530.5 MW (67.85%). The contribution of Coal, Gas and Diesel based thermal power plants of total installed capacity is 58.31%, 9% and 0.54% respectively.

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

Many of the thermal power plants are not operating to their full potential and large numbers of thermal units are old and outlived their normal life. 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 Efficiency R&M (EE R&M).

## **2.0 Objective of R&M Programme**

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

## **3.0 Objective of Life Extension Programme**

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

## **4.0 Renovation and Modernisation (R&M) and Life Extension Programme (LEP) from 7<sup>th</sup> Plan onwards till 11<sup>th</sup> Plan**

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

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

\*Tentative figure.

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

## 5.0 National Perspective Plan

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

## 6.0 LE / R&M Programme during 12<sup>th</sup> Plan (2012 - 2017)

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

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

## **6.1 Achievement of R&M/LE Programme during the 12<sup>th</sup> Plan upto 31<sup>st</sup> March 2013:**

### **6.1.1 Achievement of LE Programme during the 12<sup>th</sup> Plan upto 31<sup>st</sup> March 2013:**

During 12<sup>th</sup> Plan, LE works have been completed as per details given below:-

#### **State Sector (1 No. unit)**

1. Bathinda TPS Unit – 3 (110 MW) - Synchronised on 05.08.2012.

#### **Central Sector ( 1 No. unit)**

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

**Sub total (LE) - 2 Unit (216 MW)**

### **6.1.2 Achievement of R&M Programme during the 12<sup>th</sup> Plan up 31<sup>st</sup> March 2013:**

During 12<sup>th</sup> Plan, R&M works have been completed as details given below:-

#### **State Sector (2 Nos. of units)**

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

#### **Central Sector (1 no. unit)**

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

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

**Total (LE and R&M) - 8 Units (1176 MW)**

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

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

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

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

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

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

TOTAL : Rs. 1053.00 Crores

**Details of Funds released by Planning Commission upto 31<sup>st</sup> March 2013 :**

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

**Total : Rs. 843.096 crores**

**Commencement of work and Completion Schedule :**

| Name of TPS     | Unit No. | Zero Date   | Contractual Completion Date | Anticipated Completion Date | Present physical status                                                                                                                                                                                                                                                                      |
|-----------------|----------|-------------|-----------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Barauni TPS     | 7        | 15.11.2009  | 15.11.20011                 | 30.06.2013                  | HP & LP rotors received at site after repair. IP rotor not yet received. Boiler hydro test (drainable) done. ESP column & bracing erection in progress. 47% Boiler material erected. Works in BOP areas are in progress.                                                                     |
|                 | 6        | 15.11. 2009 | 15.06.2012                  | 15.12.2013                  | Dismantling work completed. IP,HP,LP rotors are sent to BHEL Hyderabad for repair. Boiler erection works started. Piling works in ESP, ID fan ares started. New building work of Ash slurry pump house, foundation work of DM pant, fire pump house and dust suppression system in progress. |
| Muzaffarpur TPS | 1        | 15.04. 2010 | 15.04.2012                  | April, 2013                 | 4 mills are ready, 5 <sup>th</sup> mill expected by April end. Expected synchronization by 30 <sup>th</sup> April'2013                                                                                                                                                                       |
|                 | 2        | 15.04. 2010 | 15.08.2012                  | 15.08.2013                  | Boiler erection work in progress. LP, IP Rotors dispatched for repair expected by May 2013. Drainable hydro test expected in May'13. KBUNL has informed that as per present work the unit may get slip to Oct 2013.                                                                          |

**7.0 Future vision for Life Extension / R&M Programme**

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

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

## **8.0 External Co-operation for R&M of TPS**

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

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

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

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

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

#### **i) Nasik TPS**

The final DPR for Unit-3 (210 MW) was prepared by the consultant, and same has been accepted by MAHAGENCO and MERC. As per the DPR the estimated cost of the R&M works is ₹ 481.46 crores (62 millions Euro). Govt. of Maharashtra has approved the 20 % equity of ₹ 96.29 crores for the project. Mahagenco have appointed M/s Steag Energy Services ( India) on 14.06. 2012 as an Implementation Support Consultant. The tender documents for procurement of executing agency for BTG package have been prepared. KfW has given their No- Objection for the commercial and technical specification for all the packages on 17.08.2012. The approval of tender document by MAHAGENCO Board and signing of the loan agreement with KfW is in process.

#### **ii) Kolaghat TPS**

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

#### **iii) Bokaro ‘B’ TPS**

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

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

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

### **Phase-I Task**

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

### **Phase-II Task**

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

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

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

The fourth Meeting of Task Force was held on 03-08-2012 wherein Inception Report, submitted by the M/s Lahmeyer, was discussed. Based on the comments/observations of CEA/KfW & members of the Task Force, M/s Lahmeyer revised the Inception Report and submitted the final Inception Report on 29-08-2012. M/s Lahmeyer have also submitted model Feasibility Report on 24-08-2012 & concept paper on tendering procedure on 21-09-2012. M/s Lahmeyer submitted the revised draft model Feasibility Report incorporating the comments of CEA in December 2012 which has been sent to members of Task Force, KfW, IGEF and stakeholders for consultation.

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

The World Bank has financed the “Coal-Fired Generation Rehabilitation Project-India” for demonstrating Energy Efficiency Rehabilitation & Modernization (EE R&M) at coal fired

generating units through rehabilitation of 640 MW of capacity across three States-West Bengal, Haryana and Maharashtra. The above project has two components:-

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

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

**Component-2. Technical Assistance to CEA and Utilities**

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

**8.3.1 World Bank funded Energy Efficiency Pilot R&M Projects**

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

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

**Status of Physical Progress:**

➤ **BTG Package:**

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

➤ **CHP Package:**

The contract was awarded to M/s Vinar System Pvt. Ltd. on 14-11-2012 and contract was signed on 3<sup>rd</sup> January,2013.

➤ **AHP Package:**

1<sup>st</sup> Stage Bid Evaluation is in process and contract is awarded on 5<sup>th</sup> March,2013.

➤ **Electrical Package:**

The contract was awarded to M/s Alstom T&D India Ltd. on 19-10-2012 and contract was signed on 28-12-2012.

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

Total cost of the project is ₹ 486 Cr. Fund allocation for the Koradi TPS is around US \$ 59 million (Loan) and Grant US \$ 12.45 million. M/s Evonik Energy Services (Project

design consultant) prepared the DPR. The same has been approved and accepted by MSPGCL Board on 26-06-2009. In-principle approval of MERC for capital expenditure had been received on 24-05-2010. The R&M project consists of four major packages BTG, Electrical, BOP & CHP.

**Status of Physical Progress:**

➤ **BTG Package**

Bids (2<sup>nd</sup> stage) were opened on 23-08-2012 and bid evaluation report has been completed and the same has been forwarded to World Bank on 30.1.2013 for NOC.

➤ **Electrical Package**

The Letter of Award issued to M/s ABB Ltd on March 19, 2012 and final contract was signed on May 25, 2012 for a contract price of ₹ 802 lakhs. Advance Payment of ₹ 80 Lakhs has been made to M/s ABB. Further, the expected date of completion of the contract is August 26, 2015.

➤ **BOP Package**

Letter of Award issued to M/s Tecpro Systems Ltd. on July 16, 2012 for a contract price of ₹ 2908 lakhs . The final contract was signed on August 10, 2012. Further, the expected date of completion of the contract is August 26, 2015.

➤ **Post Award Consultancies**

• **Koradi,U-6: Implementation Support Consultant :**

Contract was signed with Tata Consulting Engineering Ltd.(TCE) on June 1, 2012 for contract price ₹ 4.12 crs. The expected date of completion of the contract is August 26, 2015.

• **Koradi,U-6: Quality Assurance Consultant :**

RfP documents issued to all short-listed consultants on November 16, 2011. Final date of proposal submission will be decided after the BTG package supplier is identified.

**iii) Rapid Social Assessment Consultant for three plants Chandrapur TPS (Unit 1&2,2x210 MW), Bhusawal TPS (Unit-2, 210 MW) and Parli TPS (Unit-3, 210 MW)**

Contract was signed on 29-07-2011 with M/s Harshal Gramin Vikas Bahu Sanstha for contract price of ₹13.52 lacs. The final report was submitted by the consultant on 11.01.2013 to Bhusawal TPS.

**iv) Chandrapur TPS,U-1&2**

**Design Consultant :**

Contract was signed on 11-10-2010 with M/s Energo for a contract price of ₹ 140 lacs. RLA and Energy Audit has been completed and reports are being finalized by the consultant based on the comments received from the CSTPS. DPR with Options is under preparation. The contract is extended up-to 10.05.2013.

**Environment and Due Diligent (EADD) Consultant :**

Contract was signed on 12-10-2010 with M/s Ernst & Young Ltd for a contract price of ₹ 37 lacs. The consultant have submitted the revised Final EADD Report to CSTPS and the same was forwarded to World Bank on 05-12-2012. The same is likely to be finalized soon.

v) **Bhusawal TPS,U-2:**

**Design Consultant :**

Contract was signed on 14-06-2011 with M/s Energo for a contract price of ₹ 106 lacs. RLA study is completed. Energy Audit Report & Assessment Report of all systems are being reviewed and expected to be completed shortly. The DPR with various options is under preparation.

**EADD Consultant :**

Contract was signed on 17-06-2011 with M/s Enzen Global Solutions Pvt. Ltd. for a contract price of ₹ 26.32 lacs Final EADD Report has submitted on 25-05-2012. The report is to be modified as per the discussion held with World Bank Officials on 30-07-2012 at MSPGCL H.O. Corrected final report is received.

vi) **Parli TPS,U-3,**

**Design Consultant :**

Contract was signed on 05-09-2011 with M/s Energo for a contract price of ₹ 111 lacs. RLA study & Energy audit completed and report are received. Market survey and scope of work has been submitted on 14.3.2013.

**EADD Consultant :**

Contract was signed on 05-08-2011 with M/s Enzen for a contract price of ₹ 25.89 lacs. The revised report based on the discussions held with World Bank Officials on 30-07-2012 received by Parli TPS and forwarded to World Bank on 05.11.2012. Draft final report submitted on 12.2.2013.

**Status of Financial Progress :**

|                                                           |                  |
|-----------------------------------------------------------|------------------|
| Original Estimated Cost incl. R&M project & Consultancies | : ₹ 500.19 crore |
| Cumulative expenditure incurred up to Nov. 2012           | : ₹ 1.94 crore   |

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

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

**Status of Financial Progress :**

|                            |                |
|----------------------------|----------------|
| The Cumulative expenditure | : ₹ 0.53 crore |
|----------------------------|----------------|

**Assessment of O&M Practices:**

HPGCL has shown interest to carry out assessment of O&M Practices under World Bank fund. Accordingly EOIs have been evaluated and short listing of consultants have been sent to World Bank for their approval.

### 8.3.2 Technical Assistance to CEA

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

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

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

| Sl. No. | Consultancy services                                                                     | Status as on (31.12.2012)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | Implementation Support Consultancy (ISC)                                                 | M/s ABPS Infrastructure was appointed as ISC on 28.10.2010 for assisting CEA in implementing the project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2.      | Study on Reduction of Barriers to R&M intervention in thermal power station in India.    | M/s Mercados Energy Market India has been appointed as a consultant w.e.f. 24.04.2012. M/s Mercados visited various power utilities/entities for stake holder consultation during July-September, 2012 and submitted two draft guidelines i.e. ‘Risk identification & mitigation measures in R&M projects’ and ‘Early identification of potential technical surprises & way of addressing them’. These guidelines have been discussed in the 2 <sup>nd</sup> Task Force meeting held on 21-12-2012. The Draft Report on Study of International Best Practices in R&M and Draft report on study of Identifying the Potential Reduction in GHG Emission and possible framework for monetizing the GHG reduction. The reports have been sent to members of the task force for their comments. |
| 3.      | Study on Developing Markets for implementation of R&M in thermal power stations in India | M/s Mercados Energy Market India has been appointed as a consultant w.e.f. 14.05.2012. They have submitted the draft report on “Estimation of R&M potential in India during XII and XIII Five Year Plan” in January 2013. The Draft report on study on Developing Market of Implementation of R&M scheme in thermal power stations in India has been submitted on 6 <sup>th</sup> March’ 13 and sent to members of the task force for their comments.                                                                                                                                                                                                                                                                                                                                      |

|    |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                   |
|----|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. | Review of Experience from Pilot R&M projects                                     | M/s WAPCOS Ltd. has been has been appointed as a consultant w.e.f. 23-07-2012. M/s WAPCOS submitted inception report on 06-09-2012 and started consultation with utilities for collection of inputs on procurement experience in R&M projects. WAPCOS experts have visited the Panipat TPS in October'12, Amarkantak TPS & Koradi TPS in March '13 for review of R&M experiences. |
| 5. | Review of Institutional Capacity and capacity strengthening interventions in CEA | M/s KPMG has been appointed as consultant w.e.f. 16-07-2012. M/s KPMG submitted inception report 30-08-2012. A workshop has been held in CEA in October'12 to have discussions with officers of CEA. They are carrying out the stakeholder consultation to prepare a report on 'Customer Expectation Survey'.                                                                     |

Total contractual value for all the above consultants is: ₹ 349.647 Lakhs

The Expenditure incurred during the current F.Y.2012-13 is: ₹ 92.25 Lakhs.

The cumulative expenditure incurred till date is : ₹ 111.92 Lakhs.

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

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

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

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

#### **8.5 JICA Study on Renovation & modernization complete replacement of state sector old inefficient coal based thermal power units in India.**

A study on Renovation & modernization complete replacement of state sector old inefficient coal based thermal power stations in India was assigned to JICA by Government of India in respect of the following state sector power stations:

- a) Obra A TPS Unit No. 1 to 8 (U.P) – complete replacement.
- b) Satpura TPS Unit No. 1 to 5 (M.P) – complete replacement.
- c) Bhusawal TPS Unit No. 2 & 3 (Maharashtra) – complete replacement.
- d) Parli TPS Unit No. 3 to 5 (Maharashtra) – complete replacement or R&M.

JICA had conducted site visit during the period of March-April 2012 in above all the TPSs and the Final Report was submitted on 21.06.2012 by JICA.

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Details of Units where LE/R&M works to be taken up during the 12<sup>th</sup> Plan

(As on 31.3.2013)

STATE SECTOR (LE Programme)

| S.N. | State       | Name of Station | Unit No. | Year of Comm. | Cap. (MW)  | Present status                                                                                                                                                                                                                                                                                                                                                                                                                |
|------|-------------|-----------------|----------|---------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | U.P.        | Obra            | 10       | 1977          | 200        | BHEL is executing agency. Unit taken under S/d since 22.03.2012. The revised scope of supply and services for turbine for name plate rating i.e. 200 MW in place of 216 MW has been finalised at revised total contract price for unit 10 to 13 at 1145.76 Crore. The revised zero date is 25.3.2013. The completion of first unit in 24 months and subsequent units shall be completed with a time interval of 3 month each. |
| 2    | U.P.        | Obra            | 11       | 1977          | 200        |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3    | U.P.        | Obra            | 12       | 1981          | 200        |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4    | U.P.        | Obra            | 13       | 1982          | 200        |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 5    | U.P.        | Harduaganj      | 7        | 1978          | 110        | BHEL is executing agency. Unit taken under S/d since 05.03.2011. Expected to be synchronised by June 2013.                                                                                                                                                                                                                                                                                                                    |
| 6    | U.P.        | Parichha        | 1        | 1984          | 110        | Order Placed on BHEL for LE of unit 2 and BOP of both units 1&2. Work in progress in BOP area                                                                                                                                                                                                                                                                                                                                 |
| 7    | U.P.        | Parichha        | 2        | 1985          | 110        | Estimated cost of R&M Scheme is Rs. 287 Crore (BTG works of U-2 & BOP works of U-1&2) and Scheme financed by PFC. Work in progress.                                                                                                                                                                                                                                                                                           |
| 8    | Punjab      | <b>Bathinda</b> | <b>3</b> | <b>1978</b>   | <b>110</b> | BHEL is executing agency. The unit taken under s/d on 14.01.2010, and synchronised on 05.8.2012.                                                                                                                                                                                                                                                                                                                              |
| 9    | Punjab      | Bathinda        | 4        | 1979          | 110        | BHEL is executing agency. Unit taken under s/d on 05.11.2012., 31% erection work of boiler, 15% of work of turbine and its auxiliaries, 10% C&I works, 22% electrical & BOP works and 50% civil works completed. As per latest status given by BHEL, Unit-4 will be synchronized by end of July 2013.                                                                                                                         |
| 10   | Haryana     | Panipat         | 3        | 1985          | 110        | Was identified for World Bank funded project. As per DPR, Energy Efficiency R&M is not financially viable, hence no life extension works are to be taken up.                                                                                                                                                                                                                                                                  |
| 11   | Haryana     | Panipat         | 4        | 1985          | 110        |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 12   | Maharashtra | Nashik          | 3        | 1979          | 210        | Taken up under KfW funded project. .DPR approved by MSPGCL / MERC. Publishing of NIT is in process.                                                                                                                                                                                                                                                                                                                           |
| 13   | Maharashtra | Nashik          | 4        | 1980          | 210        | To be decided inline with Nashik U#3. Consultant for DPR preparation has been appointed.                                                                                                                                                                                                                                                                                                                                      |
| 14   | Maharashtra | Koradi          | 5        | 1978          | 200        | 2 <sup>nd</sup> stage Bid evaluation is in progress.                                                                                                                                                                                                                                                                                                                                                                          |
| 15   | Maharashtra | Koradi          | 6        | 1982          | 210        | WB funded project. DPR approved by MSPGCL/MERC. Electrical pkg. is awarded to M/s ABB. First stage bidding completed for BTG & BOP pkg.                                                                                                                                                                                                                                                                                       |

|                                    |              |                          |           |      |             |                                                                                                                                                                                                                     |
|------------------------------------|--------------|--------------------------|-----------|------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16                                 | Maharashtra  | Bhusawal                 | 2         | 1979 | 210         | WB funded pipeline project. RLA studies completed. DPR yet to be prepared.                                                                                                                                          |
| 17                                 | Maharashtra  | Bhusawal                 | 3         | 1982 | 210         |                                                                                                                                                                                                                     |
| 18                                 | Maharashtra  | Chandrapur               | 1         | 1983 | 210         | WB funded pipeline project. RLA studies completed.                                                                                                                                                                  |
| 19                                 | Maharashtra  | Chandrapur               | 2         | 1984 | 210         |                                                                                                                                                                                                                     |
| 20                                 | Maharashtra  | Parli                    | 3         | 1980 | 210         | WB funded pipeline project. RLA studies completed, DFR/DPR is awaited.                                                                                                                                              |
| 21                                 | Chhattisgarh | Korba (West)             | 1         | 1983 | 210         | RLA studies done by M/s Evonik. Preparation of tender documents is in process.                                                                                                                                      |
| 22                                 | Chhattisgarh | Korba (West)             | 2         | 1984 | 210         |                                                                                                                                                                                                                     |
| 23                                 | M.P.         | Satpura                  | 6         | 1979 | 200         | DPR prepared by NTPC at an estimated cost of Rs. 2100Cr for units 6 to 9. Utility is exploring the possibility of carrying out LE works through LROT. However, need based R&M works are planned during AOH.         |
| 24                                 | M.P.         | Satpura                  | 7         | 1979 | 210         |                                                                                                                                                                                                                     |
| 25                                 | Tamilnadu    | Tuticorin                | 1         | 1979 | 210         | Scope of work finalised at estimated cost of Rs. 129 Cr. Work other than main plant is in progress                                                                                                                  |
| 26                                 | Tamilnadu    | Tuticorin                | 2         | 1980 | 210         | Scope of work finalised at estimated cost of Rs. 150 Cr. Work other than main plant is in progress                                                                                                                  |
| 27                                 | A.P.         | Dr. N.T. TPS (Vijaywada) | 1         | 1979 | 210         | 77 activities were taken up at an estimated cost of Rs. 193.83 Cr. Anticipated completion by 31.12.2013.                                                                                                            |
| 28                                 | A.P.         | Dr. N.T. TPS (Vijaywada) | 2         | 1980 | 210         |                                                                                                                                                                                                                     |
| 29                                 | Karnataka    | Raichur                  | 1         | 1985 | 210         | Need based R&M works planned                                                                                                                                                                                        |
| 30                                 | Karnataka    | Raichur                  | 2         | 1986 | 210         | Need based R&M works planned                                                                                                                                                                                        |
| 31                                 | Bihar        | Barauni                  | 6         | 1983 | 110         | LOA awarded on 15.02.2010. Unit under s/d since 17.03.2012. As per BHEL unit shall be synchronised by Dec.' 2013.                                                                                                   |
| 32                                 | Bihar        | Barauni                  | 7         | 1985 | 110         | R&M in progress. Boiler erection in progress. ESP erection works is in progress. BHEL revised schedule for synchronisation is 15.06. 2013.                                                                          |
| 33                                 | Bihar        | Muzaffarpur              | 1         | 1985 | 110         | BHEL is executing agency. LOA awarded on 15.04.2010 for both the units 1&2. Unit was under s/d since 6.10.2003. Boiler lightup & turbine box up completed. Synchronisation is expected by April, 2013 with 5 mills. |
| 34                                 | Bihar        | Muzaffarpur              | 2         | 1986 | 110         | BHEL is executing agency. S/d taken on 29.03.2012. Dismantling work completed, BHEL confirmed revised schedule for Synchronisation by October, 2013.                                                                |
| 35                                 | W.Bengal     | Kolaghat                 | 1         | 1990 | 210         | KfW funded project. DPR prepared and accepted by WBPDC.                                                                                                                                                             |
| 36                                 | W.Bengal     | Kolaghat                 | 2         | 1985 | 210         | To be decided inline with Kolaghat U#1                                                                                                                                                                              |
| 37                                 | W.Bengal     | Kolaghat                 | 3         | 1984 | 210         | To be decided inline with Kolaghat U#1                                                                                                                                                                              |
| 38                                 | W.Bengal     | Bandel                   | 5         | 1982 | 210         | World Bank funded project. Contract for BTG pkg. awarded to M/s DHIC and signed on 29.2.2012 with pkg cost Euro 37.6 million plus INR 291 Crores. Expected completion <b>Sept 2014.</b>                             |
| <b>Sub Total State Sector (LE)</b> |              |                          | <b>38</b> |      | <b>6820</b> |                                                                                                                                                                                                                     |

**STATE SECTOR (R&M Programme)**

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

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

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

**Central Sector LE (Gas based)**

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

### R&M Programme Central Sector

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

**CENTRAL SECTOR R&M (Gas Based)**

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

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

**Total R&M + LE      135      29367**

## **Northern Region**

**(Unit wise Broad Status of LE works)**

**Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 31.3.2013)**

| A                                 | Project Details       | Description                                                      | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|-----------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                       |                                                                  | <b>Supply started</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1                                 | Name of Power Station | <b>OBRA</b>                                                      | <b>i) Boiler :</b> 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.<br>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.<br>100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, Economizer. O/H of Boiler Drum & Internals,<br>100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system.<br>Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system.<br>O/H & repair of damaged parts of FD fans.<br>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.<br>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.<br>Complete O/H of Oil firing system:<br><b>Replacement of Control &amp; Instrumentation:</b> 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,<br><b>Auto Control Loops for Boiler ( maxDNA based).</b>                                                                                                           |
| 2                                 | Unit No. & capacity   | <b>U-10 (200 MW)</b>                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3                                 | Make                  |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   | i) Boiler             | <b>BHEL</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   | ii) TG.               | <b>BHEL</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4                                 | Date of commissioning | <b>01/1979</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>B. RLA Study / Consultancy</b> |                       |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b>                |                       | <b>Boiler</b>                                                    | <b>TG.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Estimated Cost (Rs in Cr)         |                       | 1 crore for RLA of the unit has been covered along with LE works |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Executing Agency                  |                       | <b>BHEL</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Expected/Actual start of work     |                       |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Completion date                   |                       |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Actual Expenditure (Rs in Cr)     |                       |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   |                       |                                                                  | <b>ii) TG :</b><br><b>HP Turbine::</b> 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<br><b>IP Turbine:</b> Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms<br><b>LP Turbine:</b> 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).<br><b>Jacking oil pump (1 set).</b><br><b>Electro hydraulic governing system (1 set).</b><br><b>Auxiliary equipment:</b> Ejectors, Condenser tubes 100% replacement<br><b>Generator(1 set).</b> : 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.<br><b>TG Auxiliaries:</b> Gland steam condenser: Supply of cupronickel tube bundles considered<br>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,<br>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:<br>Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area |

| <b>C</b> | <b>R&amp;M/ LE Works</b>                   |                                                       | <b>iii) BOP :</b><br><br><b>Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW.</b><br><br><b>Station C&amp;I Equipment,</b> 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),<br><b>Static excitation system:</b> Thruster cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares. |
|----------|--------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Executing Agency Boiler/ TG.               | BHEL                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2        | No. of Activities Boiler/ TG.              |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3        | Zero date                                  | 20.6.2006                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4        | Expected/Actual date of Start of work      | 25.03.2013 (A)<br>After revised scope of work         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5        | Expected/Actual date of Completion of work |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6        | Estimated Cost (Rs in Cr)                  | Rs 1702.14 crores for units (9 to 13) 5x200 MW units. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 7        | Actual Expenditure incurred (Rs in Cr)     | <b>Rs 1136.81 Cr (On unit 9-13)</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                            |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 31.3.2013)

| A                                 | Project Details                | Description                                           | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|--------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                                |                                                       | <b>Work under progress</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1                                 | Name of Power Station          | <b>OBRA</b>                                           | <b>i) Boiler :</b> 100%Replacement damaged ceiling structure, Refractory and thermal insulation-<br>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.<br>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.<br>100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, Economizer. O/H of Boiler Drum & Internals,<br>100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping,<br>O/H of PRDS system.<br>Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system.<br>O/H & repair of damaged parts of FD fans.<br>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.<br>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.<br>Complete O/H of Oil firing system:<br><b>Replacement of Control &amp; Instrumentation:</b> 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,<br><b>Auto Control Loops for Boiler ( maxDNA based).</b>                                                                                                        |
| 2                                 | Unit No. & capacity            | <b>U-11 (200 MW)</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3                                 | Make                           |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | i) Boiler                      | BHEL                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | ii) TG.                        | BHEL                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4                                 | Date of commissioning          | 01/1979                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>B. RLA Study / Consultancy</b> |                                |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | <b>Description</b>             | <b>Boiler</b>                                         | <b>TG.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                   | Estimated Cost (Rs in Cr)      | 1 crore for RLA of the unit has been covered along LE |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | Executing Agency               | BHEL                                                  | BHEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                   | Expected/ Actual start of work |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | Completion date                |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   | Actual Expenditure (Rs in Cr)  |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                   |                                |                                                       | <b>ii) TG :</b><br><b>TG HP Turbine::</b> 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<br><b>IP Turbine:</b> Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms<br><b>LP Turbine:</b> 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).<br><b>Jacking oil pump (1 set).</b><br><b>Electro hydraulic governing system (1 set).</b><br><b>Auxiliary equipment:</b> Ejectors, Condenser tubes 100% replacement<br><b>Generator(1 set).</b> : 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.<br><b>TG Auxiliaries:</b> Gland steam condenser: Supply of cupronickel tube bundles considered<br>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,<br>Boiler Feed Pump: BFP cartridge (I No), Hydraulic coupling R16K (2 Nos), RC valve (3 Nos), Connecting coupling strainer & warm up valve, (3 Nos), Drip pump valves & fittings (2 sets), Warm up valve & safety valves for BFP (1set). O/H of Booster Pump & H.P.Heters:<br>Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area |

| C | R&M/ LE Works                              |                                                       | <b>iii) BOP :</b><br><br><b>Capping Amount of Rs. 60 crores has been of BOP for all the five units of 200MW.</b><br><br><b>Station C&amp;I Equipment,</b> 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),<br><b>Static excitation system:</b> Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares. |
|---|--------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Executing Agency Boiler/ TG.               | BHEL                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2 | No. of Activities Boiler/ TG.              |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3 | Zero date                                  | 20.6.2006                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4 | Date of Start of work                      | 13.07.2011                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5 | Expected/Actual date of Completion of work | November, 2013 (E)                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 6 | Estimated Cost (Rs in Cr)                  | Rs 1702.14 crores for units (9 to 13) 5x200 MW units. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7 | Actual Expenditure incurred (Rs in Cr)     | <b>Rs 1136.81 Cr (On unit 9-13)</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|   |                                            |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Dismantling of boiler completed.**

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

## Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 31.3.2013)

| A                                 | Project Details                | Description                                                                                      | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                                |                                                                                                  | <b>Supply started</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1                                 | Name of Power Station          | <b>OBRA</b>                                                                                      | <b>i) Boiler :</b> 100%Replacement damaged ceiling structure, Refractory and thermal insulation-<br>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.<br>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.<br>100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, O/H of Boiler Drum & Internals, Economizer.,<br>100% Replacement of Super Heaters, Attenuator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system.<br>Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system. O/H & repair of damaged parts of FD fans.<br>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.<br>O/H & Replacement of damaged parts of P.A. Fans., Suit blowing system, wall blowers.<br>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.<br>Complete O/H of Oil firing system:<br><b>Replacement of Control &amp; Instrumentation:</b> 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,<br><b>Auto Control Loops for Boiler ( maxDNA based).</b>                                                                                      |
| 2                                 | Unit No. & capacity            | <b>U-12 (200 MW)</b>                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3                                 | Make                           |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                   | i) Boiler                      | <b>BHEL</b>                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                   | ii) TG.                        | <b>BHEL</b>                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4                                 | Date of commissioning          | <b>01/1979</b>                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>B. RLA Study / Consultancy</b> |                                |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                   | <b>Description</b>             | <b>Boiler</b> <b>TG.</b>                                                                         | <b>ii) TG :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                   | 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) | <b>HP Turbine::</b> 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<br><b>IP Turbine:</b> Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms<br><b>LP Turbine:</b> 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).<br><b>Jacking oil pump (1 set).</b><br><b>Electro hydraulic governing system (1 set).</b><br><b>Auxiliary equipment:</b> Ejectors, Condenser tubes 100% replacement<br><b>Generator(1 set).</b> : 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.<br><b>TG Auxiliaries:</b> Gland steam condenser: Supply of cupronickel tube bundles considered<br>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,<br>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:<br>Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area |
|                                   | Executing Agency               | <b>BHEL</b> <b>BHEL</b>                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                   | 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                                                  | <b>Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW.</b><br><br><b>Station C&amp;I Equipment,</b> 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),<br><b>Static excitation system:</b> Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares. |
| 2 | No. of Activities Boiler/ TG.          |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 3 | Zero date                              | 20.6.2006                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 4 | Expected Date of Start of works        | *                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 5 | Expected date of Completion of works   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 6 | Estimated Cost (Rs in Cr)              | Rs 1702.14 crores for units (9 to 13) 5x200 MW units. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7 | Actual Expenditure incurred (Rs in Cr) | <b>Rs 1136.81 Cr (On unit 9-13)</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|   |                                        |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**\*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 31.3.2013)

| A                                 | Project Details       | Description                                                                                      | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|-----------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                       |                                                                                                  | <b>Supply started</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1                                 | Name of Power Station | <b>OBRA</b>                                                                                      | <b>i) Boiler :</b> 100%Replacement damaged ceiling structure, Refractory and thermal insulation-<br>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.<br>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.<br>100% Replacement of Furnace walls, Down Flow pipes, Riser Tubes, O/H of Boiler Drum & Internals, Economizer.,<br>100% Replacement of Super Heaters, Attemperator, Re-Heater, Sling Rods and supports, Spray Water piping, O/H of PRDS system.<br>Replacement of baskets, seals and sector plates gear boxes of Air and Flue gas system.<br>O/H & repair of damaged parts of FD fans.<br>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.<br>O/H & Replacement of damaged parts of P.A. Fans., Suit blowing system, wall blowers.<br>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.<br>Complete O/H of Oil firing system:<br><b>Replacement of Control &amp; Instrumentation:</b> 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,<br><b>Auto Control Loops for Boiler ( maxDNA based).</b>                                                                                                    |
| 2                                 | Unit No. & capacity   | <b>U-13 (200 MW) Upgradation to 216 MW</b>                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3                                 | Make                  |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   | i) Boiler             | BHEL                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   | ii) TG.               | BHEL                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4                                 | Date of commissioning | 01/1979                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>B. RLA Study / Consultancy</b> |                       |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b>                |                       | <b>Boiler</b>                                                                                    | <b>TG.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 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)     |                       |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   |                       |                                                                                                  | <b>ii) TG :</b><br><b>HP Turbine::</b> 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<br><b>IP Turbine:</b> Fully bladed new rotor, New blading set complete stages, Complete machined new shaft, Inner casing, sealing arrangement, fasteners, Complete set of diaphragms<br><b>LP Turbine:</b> 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).<br><b>Jacking oil pump (1 set).</b><br><b>Electro hydraulic governing system (1 set).</b><br><b>Auxiliary equipment:</b> Ejectors, Condenser tubes 100% replacement<br><b>Generator(1 set). :</b> 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.<br><b>TG Auxiliaries:</b> Gland steam condenser: Supply of cupronickel tube bundles considered<br>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,<br>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:<br>Turbine supervisory instrument including field sensors, cables, electronics. Auto Control Loops for Turbo-Generator & Re-generative Area |

| <b>C</b> | <b>R&amp;M/ LE Works</b>               |                                                       | <b>iii) BOP :</b><br><br><b>Capping Amount of Rs. 60 crores has been of BOP for all the five units of 5x200MW.</b><br><br><b>Station C&amp;I Equipment,</b> 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.,<br>Sequence of event recording SOE (integral part of DCS), Interlocks & protection for fans & BFP (maxDNA based system),<br><b>Static excitation system:</b> Thyristor cubicle, Digital regulation panel, Field breaker cubicle, Field flashing cubicle, Trunking cubicle, Mandatory spares. |
|----------|----------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Executing Agency Boiler/ TG.           | BHEL                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2        | No. of Activities Boiler/ TG.          |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3        | Zero date                              | 20.6.2006                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4        | Expected date of Start of work         | *                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5        | Expected date of Completion of work    |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 6        | Estimated Cost (Rs in Cr)              | Rs 1702.14 crores for units (9 to 13) 5x200 MW units. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7        | Actual Expenditure incurred (Rs in Cr) | <b>Rs 1136.81 Cr (On unit 9-13)</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|          |                                        |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**\*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 31.3.2013)**

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

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

**Status of LE works of Uttar Pradesh (UPRVUNL) Thermal Power Station (As on 31.3.2013)**

| A         | Project Details                        | Description                                | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|----------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                                        |                                            | <b>Order Placed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1         | Name of Power Station                  | <b>Parichha</b>                            | <b>i) Boiler :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2         | Unit No. & capacity                    | <b>1<br/>(110 MW)</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3         | Make                                   |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | i) Boiler                              | BHEL                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | ii) TG.                                | BHEL                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4         | Date of commissioning                  | 03/1984                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>B.</b> | <b>RLA Study / Consultancy</b>         |                                            | <b>(NTPC has been appointed for consultancy works)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|           | <b>Description</b>                     | <b>Boiler</b>                              | <b>TG.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|           | Estimated Cost (Rs in Cr)              |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | Executing Agency                       |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | Expected/ Actual start of work         |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | Completion date                        |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | Actual Expenditure (Rs in Cr)          |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>C</b>  | <b>R&amp;M/ LE Works</b>               |                                            | <b>iii) BOP :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1         | Executing Agency Boiler/ TG.           | BHEL                                       | <p>CHP: Replacement 2 Nos. Plough feeders, 13 Nos Vibrofeeders, 13 Nos rack &amp; 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.</p> <p>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&amp;I work for CHP &amp; AHP.</p> <p>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 &amp; alkali dozing system, pipes.</p> <p>Compressed Air system: Replacement of 4 Nos instrument air compressors, 4 Nos air dryers with pipings.</p> <p>Fire protection system: New Fire alarm system, Foam pourer system for FO/LDO tanks.</p> <p>Electrical system: Replacement of 7 Nos ABCB breakers with SF-6 breaker, Replacement of 11 Nos Isolators, 6 Nos lightening arrestors</p> <p><b>ESP augmentation</b></p> |
| 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)              | <b>Rs 343.25 Crs for both unit 1&amp;2</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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 31.3.2013)**

| A | Project Details       | Description       | Broad Scope of Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---|-----------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                       |                   | <b>Order Placed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1 | Name of Power Station | <b>Parichha</b>   | <b>i) Boiler :</b> 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 <sup>st</sup> pass & Roof panels of 2 <sup>nd</sup> 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<br>Replacement of volumetric feeders with Microprocessor based dual belt gravimetric feeders.<br>Replacement of Seal air system for Pulverisers.<br>Replacement of existing coal pipes to suit the XRP 623 mills. Replacement of existing wind boxes with HEA igniters.<br>Piping, valves & fittings of HFO/ LDO system will be redesign and refurbished to suit the NEW C&I system.<br>Replacement of existing Air cooled oil guns.<br>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.<br>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)<br>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   | <b>2 (110 MW)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3 | Make                  |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|   | i) Boiler             | <b>BHEL</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|   | ii) TG.               | <b>BHEL</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4 | Date of commissioning | <b>02/1985</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|   |                       |                   | <b>(NTPC has been appointed for consultancy works)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|   |                       |                   | <b>ii) TG :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| B.                             | RLA Study / Consultancy |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|-------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description                    | Boiler                  | G. | <b>ii) TG :</b> 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.<br>Replacement of M.P. inner casing, rotor with improved design bladings, improved gland boxes along with new gland rings.<br>Modernisation of L.P. casing and replacement of old diaphragm with new diaphragm and rotor.<br>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                          |                                                                      | <b>iii) BOP :</b> 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.<br>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.<br>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.<br>Compressed Air system: Replacement of 4 Nos instrument air compressors, 4 Nos air dryers with pipings.<br>Fire protection system: New Fire alarm system, Foam pourer system for FO/LDO tanks.<br>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)              | <b>Rs 343.25 Cr for unit 2 BTG and BOP &amp; ESP of unit 1&amp;2</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 7 | Actual Expenditure incurred (Rs in Cr) |                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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

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

(As on 31.3.2013)

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

## **Physical Progress :**

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

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

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

**(As on 31.3.2013)**

| <b>A</b>  | <b>Project Details</b>                 | <b>Description</b>                            | <b>Broad Scope of Works</b>                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|----------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                                        |                                               | <b>Order Placed</b>                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1         | Name of Power Station                  | <b>Bathinda</b>                               | <b>i) Boiler :</b><br>Complete replacement of existing indirect fired boiler with direct fired boiler.<br>Replacement of air heaters, flue gas ducting, fuel firing system, milling system, upgradation for direct firing & fans etc.                                                                                                                                                                                     |
| 2         | Unit No. & capacity                    | <b>U-4 (110 MW)<br/>Upgradation to 120 MW</b> |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3         | Make                                   |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | i) Boiler                              | <b>BHEL</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | ii) TG.                                | <b>BHEL</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4         | Date of comming                        | <b>31.01.1979</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>B.</b> | <b>RLA Study / Consultancy</b>         |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | <b>Description</b>                     | Boiler    TG.                                 | <b>ii) TG :</b><br>Retrofitting of HP, IP & LP cylinders.<br>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                                          |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>C</b>  | <b>R&amp;M/ LE Works</b>               |                                               | <b>iii) BOP :</b><br>ESP rectification.<br>Ash Handling System (Replacement of ash slurry pipe lines etc.)<br>Complete replacement of Instrument & Controls.<br>Electrical system :<br>Replacement of existing 220 KV ABCB with SF-6 breakers.<br>Replacement of Pneumatic 220 KV Isolators with motor operated mechanism, Replacement of 6.6 KV switchgear etc.<br>Civil and structural works of boiler and auxiliaries. |
| 1         | Executing Agency Boiler/ TG.           | <b>BHEL</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2         | No. of Activities Boiler/ TG.          |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3         | Zero date                              |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4         | Actual date of Start of work           | <b>5.11.2011</b>                              |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 5         | Expected Date of Completion of work.   | <b>July,2013</b>                              |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 6         | Estimated Cost (Rs in Cr)              | <b>483.95 Cr. for U-3 &amp; 4</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 7         | Actual Expenditure incurred (Rs in Cr) | <b>434.3 Cr. for U-3&amp;4</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                           |

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. Shut down of Unit 4 taken on 5.11.2011. 60% erection work of boiler, 21% of work of turbine and its auxiliaries, 15% of C&I works, 45% electrical & BOP works and 82% civil works were completed. Delay in supply from Hyderabad unit to be expedited.

## **Western Region**

**(Unit wise Broad Status of LE works)**

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

## **Southern Region**

**(Unit wise Broad Status of LE works)**

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

(As on 31.3.2013)

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

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

(As on 31.3.2013)

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

# STATUS OF LE WORKS OF TUTICORIN THERMAL POWER STATION

(As on 31.3.2013)

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

## **Eastern Region**

**(Unit wise Broad Status of LE works)**

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

(As on 31.3.2013)

| A | Project details                                |                                                                                               | Description                                                                       |  | Broad status of various activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---|------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Name of Power Station                          |                                                                                               | Barauni TPS                                                                       |  | <b>Unit under s/d since 17.03.2012. As per BHEL unit shall be synchronised by Dec’ 2013.</b><br><br><b>i) Boiler :</b> The scope of works includes :<br>1) Strengthening of Structure( columns, backstays, ceiling girders, floor grills, hand grills, painting)<br>2) Furnace bottom sealing arrangements<br>3) Replacement of water walls, Superheater , Reheater, Soot blower system, Economizer, drain& vent piping, Hangers & Supports<br>4) Pulverized fuel firing system-Coal mills (5 no.), Coal feeders (5 no.), PF piping 5 no. sets), Seal air system (2x100%)<br>5) Fuel oil firing system<br>6) Supply/Replacement of Draft & Ducting System (APH,PA fan, FD fan, ID fan, Air and Flue gas ducting<br>7) Refurbishment of ESP<br><br><b>ii) TG :</b> The scope of works includes :<br>1 ) Refurbishment of HP,IP&LP turbine<br>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<br>3) Replacement/ Refurbishment of existing AVR with digital DVR incl. necessary modifications and existing excitation system incl. supply of necessary spares.<br>4) Complete overhauling of generator stator, Testing & varnishing of rotors and refurbishment of silica gel Hydrogen drier incl. supply of necessary spares.<br>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.<br>6) Installation of Distributed Digital Control Monitoring & Information System(DDCMIS) and other C&I Systems<br><br><b>iii) BOP :</b> The scope of works includes :<br>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<br>2) Replacement/ Refurbishment/Repair of Coal Handling Plant, Ash Handling Plant & F.O. Unloading Plant. |
| 2 | Unit No. & capacity                            |                                                                                               | U-6 ,110MW                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3 | Make                                           |                                                                                               | BHEL/ BHEL                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4 | Date of Commissioning                          |                                                                                               | U# 6-01.05.1983                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| B | RLA Studies / Consultancy                      |                                                                                               |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|   | Description                                    | Boiler                                                                                        | TG                                                                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1 | Estimated Cost (Rs.Cr.)                        | Cost included in R&M work                                                                     |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2 | Executing Agency                               | BHEL                                                                                          | BHEL                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3 | Exp / Act Start date                           | Boiler-4.5.06<br>Turbine – 18.5.06<br>Generator Stator-15.5.06                                |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4 | Comple-tion date                               | Boiler-17.5.06<br>Turbine –5.6.06<br>Generator Stator- 17.5.06                                |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5 | Actual Exp. (Rs.Cr.)                           | R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost. |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| C | R&M / LE works                                 |                                                                                               |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1 | Estimated cost for both units no.6&7 (Rs. Cr.) |                                                                                               | Rs.572.16 Cr. (including the cost of RLA*)                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2 | Executing Agency : Boiler/ TG                  |                                                                                               | BHEL/ BHEL                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3 | No. of activities : Boiler / TG                |                                                                                               |                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4 | Date of start / completion (E/A)               |                                                                                               | LOA:16/02/2010<br>Zero Date: 16/11/2009<br><br>(BHEL to confirm revised schedule) |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5 | Actual Expenditure incurred (Rs. Cr.)          |                                                                                               | Rs. 405.61 Cr. for both the units 1&2 (incl. restoration of Unit-6)               |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

\* Planning Commission vide their letter dated 16.11.2009 approved the revised cost estimates of Rs.1053 crores including consultancy charges under the Special Plan for Bihar for both BTPS & MTPS. Dismantling work completed. IP,HP,LP rotors are sent to BHEL Hyderabad for repair. Boiler erection works started. Piling works in ESP, ID fan areas started.

New building work of Ash slurry pump house, foundation work of DM pant, fire pump house and dust suppression system in progress.

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

(As on 31.03.2013)

| A | Project details                                | Description                                                                                   |      | Broad status of various activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|---|------------------------------------------------|-----------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1 | Name of Power Station                          | Barauni TPS                                                                                   |      | Unit under shut down. As proposed by BHEL, anticipated date of synchronization is 30 <sup>th</sup> June, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| 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                      |                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|   | Description                                    | Boiler                                                                                        | TG   | <b>i) Boiler :</b> The scope of works includes :<br>1) Strengthening of Structure( columns, backstays, ceiling girders, floor grills, hand grills, painting)<br>2) Furnace bottom sealing arrangements<br>3) Replacement of water walls, Superheater ,Reheater, Soot blower system, Economizer, drain& vent piping, Hangers & Supports<br>4) Pulverized fuel firing system-Coal mills (5 no.), Coal feeders (5 no.), PF piping 5 no. sets), Seal air system (2x100%)<br>5) Fuel oil firing system<br>6) Supply/Replacement of Draft & Ducting System (APH,PA fan, FD fan, ID fan, Air and Flue gas ducting<br>7) Refurbishment of ESP<br><br><b>ii) TG :</b> The scope of works includes :<br>1 ) Refurbishment of HP,IP&LP turbine<br>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<br>3) Replacement/ Refurbishment of existing AVR with digital DVR incl. necessary modifications and existing excitation system incl. supply of necessary spares.<br>4) Complete overhauling of generator stator, Testing & varnishing of rotors and refurbishment of silica gel Hydrogen drier incl. supply of necessary spares.<br>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.<br>6) Installation Of Distributed Digital Control Monitoring& Information System(DDCMIS) and other C&I Systems<br><br><b>iii) BOP :</b> The scope of works includes :<br>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<br>2) Replacement/ Refurbishment/Repair of Coal Handling Plant, Ash Handling Plant & F.O. Unloading Plant.<br><br>In the first phase of R&M, the restoration of BOP has also been done by BHEL. |  |
| 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<br>Turbine – 18.5.06<br>Generator Stator-15.5.06                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 4 | Completion date                                | Boiler-17.5.06<br>Turbine –5.6.06<br>Generator Stator- 17.5.06                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 5 | Actual Exp. (Rs.Cr.)                           | R&M work is being executed on turnkey basis and the cost against RLA is included in R&M cost. |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| C | R&M / LE works                                 |                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 1 | Estimated cost for both units no.6&7 (Rs. Cr.) | Rs. 572.16 Cr. (including the cost of RLA*)                                                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 2 | Executing Agency : Boiler/ TG                  | BHEL/ BHEL                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 3 | No. of activities : Boiler / TG                |                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 4 | Date of start / completion (E/A)               | LOA:16/02/2010<br>Zero Date: 16/11/2009<br>Mach, 2013.                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 5 | Actual Expenditure incurred (Rs. Cr.)          | Rs. 405.61 Cr. for both the units 1&2 (incl. restoration of Unit-6)                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |

\*Planning Commission vide their letter dated 16.11.2009 approved the revised cost estimates of Rs.1053 crores including consultancy charges under the Special Plan for Bihar for both BTPS & MTPS. Boiler and ESP erection works is in progress. BHEL revised schedule for synchronisation is 15.06. 2013. HP & LP rotors have been received at site IP rotor yet to be received. Bolier hydro test (drainable) done. ESP column & bracing erection in progress. 47% Boiler material erected. Works in BOP areas are in progress.

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

(As on 31.3.2013)

| A | Project details                                |                                                                                               | Description                                                   | Broad status of various activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---|------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Name of Power Station                          |                                                                                               | <b>Muzaffarpur TPS</b>                                        | Unit under shut down                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2 | Unit No. & capacity                            |                                                                                               | <b>U-1,110MW</b>                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3 | Make                                           |                                                                                               | BHEL/BHEL                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4 | Date of Commissioning                          |                                                                                               | 31.03.1985                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| B | RLA Studies / Consultancy                      |                                                                                               |                                                               | <b>i) Boiler:</b> The scope of works includes :<br>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.<br>2) Fuel Oil Firing System.<br>3) Renovation/ Overhauling of APH &Draft system<br>4) Refurbishment of ESP<br>5) Replacement of Gates & dampers and Sample cooler along with valves and piping<br>6) Supply of Hangers and supports, BHEL Vision (electronic water level indicator)<br>7) Servicing of Boiler drum with internals and strengthening of boiler main structure and painting<br><br><b>ii) TG:</b> The scope of works includes :<br>1) Replacement/repairs/polishing & modification of HP/IP/LP Turbine<br>2) Replacement of all flexible hoses<br>3) Balancing of all finished rotor & repairing of casing<br>4) Refurbishment of Shaft Turning gear(U-1 only),Turbine Governing System, Turbine gland system, Deaerator, Steam jet air ejector<br>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<br>6) Installation Of Distributed Digital Control Monitoring & Information System(DDCMIS)<br>7) Complete overhauling of generator stator & complete testing /varnishing of generator rotor.<br>8) Regarding Electrical works, Refurbishment / replacement/supply of transformers, Generator bus duct, Protection panels, Bus changeover schemes, 220/132KV Switchyard.<br><br><b>iii) BOP :</b> The scope of works includes :<br>R & M of Bore well system ,Fire fighting system, Pre Treatment Plant, DM Plant , Chlorination Plant ,<br><br>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. |
|   | Description                                    | Boiler                                                                                        | TG                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1 | Estimated Cost (Rs.Cr.)                        | a) Included in restoration cost for unit # 2<br>b) For unit # 1 Not charged                   |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2 | Executing Agency                               | BHEL                                                                                          | BHEL                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3 | Exp / Act Start date                           | Boiler-4.5.06<br>Turbine – 18.5.06<br>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 : <b>Boiler/ TG</b>           |                                                                                               | BHEL/ BHEL                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3 | No. of activities : Boiler / TG                |                                                                                               | 48 Packages                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4 | Date of start / completion (E/A)               |                                                                                               | LOA:15/04/2010<br>15.07.2010<br>April ,2013 (E)               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 5 | Actual Expenditure incurred (Rs. Cr.)          |                                                                                               | 356.4 Cr for both the units 1&2. (incl. restoration of Unit-2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Status:** 4 mills are ready, 5<sup>th</sup> mill expected by April end. Expected synchronization by 30<sup>th</sup> April'2013

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

(As on 31.03.2013)

| A        | Project details                                |                                                                                               | Description                                                         | Broad status of various activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Name of Power Station                          |                                                                                               | <b>Muzaffarpur TPS</b>                                              | <b>Unit under shut down</b><br><br><b>i) Boiler:</b> The scope of works includes :<br>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.<br>2) Fuel Oil Firing System<br>3) Renovation/ Overhauling of APH &Draft system<br>4) Refurbishment of ESP<br>5) Replacement of Gates & dampers and Sample cooler along with valves and piping<br>6) Supply of Hangers and supports, BHEL Vision (electronic water level indicator)<br>7) Servicing of Boiler drum with internals and strengthening of boiler main structure and painting<br><b>ii) TG:</b> The scope of works includes :<br>1) Replacement/repairs/polishing & modification of HP/IP/LP Turbine<br>2) Replacement of all flexible hoses<br>3) Balancing of all finished rotor & repairing of casing<br>4) Refurbishment of Shaft Turning gear(U-1 only),Turbine Governing System, Turbine gland system, Deaerator, Steam jet air ejector.<br>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<br>6) Installation Of Distributed Digital Control Monitoring & Information System(DDCMIS)<br>7) Complete overhauling of generator stator & complete testing/varnishing of generator rotor<br>8) Regarding Electrical works, Refurbishment / replacement/supply of transformers, Generator bus duct, Protection panels, Bus changeover schemes, 220/132KV Switchyard.<br><b>*Partly restored during restoration of unit -2.</b><br><b>iii) BOP :</b> The scope of works includes :<br>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.<br><b>*Partly restored during restoration of unit -2.</b><br><b>Both the streams of CHP become operational on 20.04.2010.</b><br><b>R&amp;M of one wagon Tippler completed in Sept.'2010.</b> |
| 2        | Unit No. & capacity                            |                                                                                               | <b>U-2,110MW</b>                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|          | Make                                           |                                                                                               | BHEL/BHEL                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4        | Date of Commissioning                          |                                                                                               | 17.03.1986                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>B</b> | <b>RLA Studies / Consultancy</b>               |                                                                                               |                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|          | <b>Description</b>                             | <b>Boiler</b>                                                                                 | <b>TG</b>                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1        | Estimated Cost (Rs.Cr.)                        | a) Included in restoration cost for unit # 2<br>b) For unit # 1 Not charged                   |                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2        | Executing Agency                               | BHEL                                                                                          | BHEL                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3        | Exp / Act Start date                           | Boiler-4.5.06<br>Turbine – 18.5.06<br>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. |                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>C</b> | <b>R&amp;M / LE works</b>                      |                                                                                               |                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1        | Estimated cost for both units no.1&2 (Rs. Cr.) |                                                                                               | 471.80                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2        | Executing Agency : <b>Boiler/ TG</b>           |                                                                                               | BHEL/ BHEL                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3        | No. of activities : Boiler / TG                |                                                                                               | 48 Packages                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4        | Date of start / completion (E/A)               |                                                                                               | LOA:15/04/2010<br>Sept.' 2011<br>(BHEL to confirm revised schedule) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5        | Actual Expenditure incurred (Rs. Cr.)          |                                                                                               | 356.4 Cr for both the units 1&2.<br>(incl. restoration of Unit-2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Status:** Boiler erection work in progress. LP, IP Rotors dispatched for repair expected by May 2013. Drainable hydro test expected in May'13. KBUNL has informed that as per present work the unit may get slip to Oct 2013.

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

(As on 31.3.2013)

| A        | Project details                                          | Description        | Broad status of various activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|----------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Name of Power Station                                    | <b>Bandel</b>      | <b>Contract for BTG Package awarded to M/s. DHIC and signed on 29.02.2012.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2        | Unit No. & capacity                                      | <b>U-5 , 210MW</b> | <b>Main Plant Package (BTG)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3        | Make : Boiler/TG                                         | AVB/BHEL           | <b>Boiler:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4        | Date of Commissioning                                    | 23/03/1983         | <ul style="list-style-type: none"> <li>* Replacement of major Valves, Controllers &amp; Hangers and Supports in Boiler &amp; Turbine Area</li> <li>* Replacement of Water wall tubes, Attemperators</li> <li>* Replacement of Economiser coil</li> <li>* Replacement of Platen Superheater coils</li> <li>* Replacement of Final Superheater tubes</li> <li>* Complete replacement of Air pre heater tubes</li> <li>* Up-gradations of Mills and auxiliaries</li> <li>* Modification of ESP to achieve 90 mg/Nm<sup>3</sup> emission level at ESP Outlet</li> </ul> <b>Turbine:</b> <ul style="list-style-type: none"> <li>* Complete replacement of HP, IP &amp; LP turbine</li> <li>* Complete tube replacement of Condenser, LP &amp; HP Heaters</li> <li>* Replacement of BFP Cartridge with high efficient cartridge</li> <li>* Replacement of CEP, CW Pump</li> </ul> <b>Generator:</b> <ul style="list-style-type: none"> <li>*Replacement of Generator by new Generator</li> </ul> |
| <b>B</b> | <b>RLA Studies / Consultancy</b>                         |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|          | <b>Description</b>                                       | <b>Boiler</b>      | <b>TG</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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.)                                     |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>C</b> | <b>R&amp;M / LE works</b><br>(Estimated cost: Rs.652 Cr. |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|   |                                                           |                                        |  |
|---|-----------------------------------------------------------|----------------------------------------|--|
| 1 | Total No. of package                                      | 4 (four) – BTG, CHP, Electrical & AHP. |  |
| 2 | Executing Agency :<br><b>BTG package</b>                  | M/s DHIC                               |  |
| 3 | Zero date                                                 | 29.02.2012                             |  |
| 4 | <b>Date of start</b><br>(Original/ Expected /Actual)      | Expected Date of start                 |  |
| 5 | <b>Date of completion</b><br>(Original/ Expected /Actual) | Sept 2014 (E).                         |  |
| 6 | Actual Expenditure incurred (Rs. Cr.)                     |                                        |  |

### **Physical Progress:**

Contract awarded for BTG Package, Electrical System Package, Coal Handling Package. Ash Handling Package – Bid evaluation is in process.