

**MADHYA PRADESH ELECTRICITY REGULATORY COMMISSION  
BHOPAL**

**Subject: In the matter of approval of capital expenditure towards need based R&M works in Unit-6, 7, 8 and 9 of STPS, Sarni.**

**Petition No.56/2012**

**ORDER**

(Date of Order : 7<sup>th</sup> November, 2012)

**M.P. Power Generating Co. Ltd., Jabalpur**

**Petitioner**

V/s

- 1. M. P. Power Management Co. Ltd., Jabalpur**
- 2. M. P. Paschim Kshetra Vidyut Vitaran Co. Ltd., Indore**
- 3. M. P. Madhya Kshetra Vidyut Vitaran Co. Ltd., Bhopal**
- 4. M. P. Poorv Kshetra Vidyut Vitaran Co. Ltd., Jabalpur**
- 5. M. P. Power Transmission Co. Ltd., Jabalpur**

**Respondents**

Shri A.P. Bhairve, Director (Comml), Shri S.P. Soni, Director Technical, Shri S.K. Khiani, Addl. C.E., Shri Manjeet Singh, Addl. Director, Shri P.K. Chaturvedi, S.E., Shri B.C. Joshi, E.E.(R&M), Shri A. K. Singhai, EE(Gen) and Shri N. Mathur, EE(Gen) appeared on behalf of M.P. Power Generating Co. Ltd., Jabalpur.

Shri V. Ramesh Iyer, DGM appeared on behalf of MP Madhya Kshetra Vidyut Vitaran Co. Ltd., Bhopal.

Shri Anant Chaure, Law Officer and Shri Himanshu Chouhan, AE (Comm.) appeared on behalf of M. P. Paschim Kshetra Vidyut Vitaran Co. Ltd., Indore.

The petitioner has filed the subject petition seeking approval of capital expenditure for Rs.336.80 crores for need based R&M works in Unit-6, 7, 8 and 9 (1x200 MW + 3x210 MW) of Satapura Thermal Power Station (STPS), Sarni.

2. MPPGCL has filed the subject petition in the following backdrop:

- (i) Vide Commission's Order dated 16<sup>th</sup> July 2010 in petition No.64/2009 (regarding R&M scheme of STPS, Sarni), MPPGCL was asked to conscientiously review the DPR to align it with revised guidelines issued by CEA and file a fresh proposal with a more structured approach to Residual Life Assessment (RLA) to ascertain achievable heat rate on a more definitive basis.

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- (ii) Sub-article 2.3 of the PPA executed with MP Tradeco (now MP Power Management Co. Ltd.) on 29<sup>th</sup> November, 2006 provides for steps to renovate, modernize, refurbish, expand and augment capacity in the existing generating stations.
- (iii) MP Pollution Control Board (MPPCB), while according its consent for establishing extension of Unit No.10 and 11 at STPS, Sarni had also imposed a condition on the petitioner that it renovate the ESPs of Unit No.6 to 9 to limit the particulate emission within 50 mg/Nm<sup>3</sup>.
- (iv) The Board of Directors of the company in their meeting held on 12<sup>th</sup> August, 2011 decided the following :
- a) To explore the possibility for Public Private Partnership (PPP) for implementation of R&M and ESP Augmentation works of Unit No.6 to 9 of STPS Sarni, through the Lease, Rehabilitate, Operate and Transfer (LROT) option, as suggested in CEA Guidelines.
- b) Consultancy services of an expert be obtained for assisting MPPGCL in awarding the above project
- c) Transaction Advisor appointed for LROT.

3. The petitioner has broadly submitted the following in the petition :

- (i) A consultancy contract on M/s NTPC was placed by the petitioner for conducting RLA, Continuous Assessment (CA), Performance Evaluation Test (PET), Energy Audit in Unit No.7 of STPS, Sarni and preparation of DPR for comprehensive R&M works of Unit No.6, 7, 8 & 9 of STPS Sarni.
- (ii) The consultant, M/s NTPC carried out the above studies and on the basis of these studies, a fresh DPR has been prepared by M/s NTPC with a project cost of Rs.2249.25 crores as given below :

<b>S. No.</b>	<b>Particulars</b>	<b>Amount in Cr. Rs.</b>
1	Total Project Cost for the comprehensive R&M works with Up-rate Option and R&M of ESP and Dry Ash Handling system, excluding IDC	2037.90
2	Interest During construction & Financing Charges (IDC & FC)	211.35
	<b>Project Cost including IDC&amp; FC</b>	<b>2249.25</b>

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- (iii) The aforesaid comprehensive R&M works are capital intensive and require a long time to renovate the machines. MPPGCL is also in the process of installing new capacities, which may allow longer shutdowns of units after a few years. Hence, at this stage need-based R&M appears to be the most viable solution.
- (iv) Unit No.6 to 9 of STPS, Sarni have been identified for this need based R&M on the basis of downward trend in their performance.
- (v) The proposed need based R&M work are already recommended by M/s NTPC under the DPR prepared by them. MPPGCL has planned to carry out R&M works/augmentation of ESPs, Ash Bund and Sewage Water Treatment Plant at STPS, Sarni to improve environmental conditions, in line with the directives of MPPCB. A separate petition will be filed by MPPGCL for approval of capital expenditure on these schemes after finalization of proposals.
- (vi) The proposed need based R&M works of urgent nature have been identified after detailed in-house study by the site engineers and an action plan has been worked out for replacement of items. These works are proposed to be carried out during the forthcoming Annual Overhauls of these units.
- (vii) Out of the proposed need based R&M activities, some works have already been executed during the AOH of Unit No. 6 and 8 of STPS Sarni in FY 2012 and the performance of these Units has improved appreciably after execution of need based R&M works.

4. It is further stated in the petition that the performance level of these units shall further deteriorate if the proposed need based R&M is not executed. The petitioner indicated the following improvement in performance parameters on execution of the proposed need based R&M works in the subject petition:

S. No.	Particulars	FY 2013			
		Unit 6	Unit 7	Unit 8	Unit 9
1	Plant Load Factor (%)	69.30	59.70	69.70	60.90
2	Auxiliary Consumption (%)	9.85	10.25	10.50	11.50
3	Specific Oil Consumption (ml/kW hr)	3.00	4.00	3.00	6.00
4	Heat Rate (K Cal/kW hr)	3400	3500	3500	3500

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5. The hard cost of the proposed R&M works is worked out to Rs.292.34 crores and year-wise phasing of expenditure is filed as under :

<b>Total Estimated Value [Cr Rs]</b>			
<b>In FY 12</b>	<b>In FY 13</b>	<b>In FY 14</b>	<b>Total</b>
43.57	150.41	98.35	292.34

The break-up of the above hard cost in terms of other costs, taxes and duties is filed as under:

<b>Base Price</b>	<b>Taxes &amp; Duties</b>	<b>Other</b>	<b>Total</b>
243.81	26.74	21.79	292.34

6. The petitioner has considered funding of 90% project cost through loan with interest rate of 12.5%. The year-wise estimated value with IDC and the break-up into loan and equity is filed as given below :

<b>S. No</b>	<b>Particulars of Works</b>	<b>Total Estimated Value [Cr Rs]</b>			
		<b>In FY 12</b>	<b>In FY 13</b>	<b>In FY 14</b>	<b>Total</b>
1	Total	43.57	150.41	98.35	292.34
2	IDC	0.00	12.79	31.67	44.47
<b>3</b>	<b>Total</b>	<b>43.57</b>	<b>163.21</b>	<b>130.02</b>	<b>336.80</b>
4	Loan	39.21	146.89	117.02	303.12
5	Equity	4.36	16.32	13.00	33.68
<b>6</b>	<b>Total</b>	<b>43.57</b>	<b>163.21</b>	<b>130.02</b>	<b>336.80</b>

7. The Housing and Urban Development Corporation (HUDCO) agreed to extend a loan of Rs.300 crores to MPPGCL for the subject need based R&M works of Unit No.6 to 9 at STPS, Sarni. The remaining amount of Rs.36.80 crores shall be funded by MPPGCL through internal resources by way of equity infusion.

8. Motion hearing in the subject petition was held on 21<sup>st</sup> August, 2012 when the petition was admitted and the petitioner was directed to file certain clarifications/additional information by 10<sup>th</sup> September, 2012. The petitioner was asked to review the cost benefit analysis of the proposed capital expenditure in accordance with the norms specified in the extant regulations.

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9. The petitioner was also asked to serve copies of the petition on all respondents in the matter. The petition was uploaded on Commission's website seeking comments /suggestions from other stakeholders. No comment/suggestion has been received in the matter from any stakeholder.

10. In response, the petitioner vide its letter dated 7<sup>th</sup> September, 2012 followed by another detailed explanation vide letter dated 15<sup>th</sup> October, 2012 broadly submitted the following :

- (i) The target norms for these units, which have already outlived their designed life of 25 years, are at a level which can be achieved only after comprehensive R&M of these units, which is yet to be done. It is also prudent to mention here that in the study conducted by NTPC and the DPR prepared for comprehensive R&M, the maximum ceiling of improvements which can be targeted with proposed level of expenses (about Rs. 2200 Cr), is at par with the targets already set by the Commission before comprehensive R&M of these units.
- (ii) The process of finding a private investor for LROT mode is under way and the process of finalization may take 1 to 1 ½ years time. The LROT mode may be the first case in the country for such type of investment. Till the proposal materializes, MPPGCL have two options :
  - a. *Wait till the proposal materializes and comprehensive R&M is done.*
  - b. *Undertake need based R&M works and adjust the cost in comprehensive R&M scheme.*

In case MPPGCL adopts the option "b", there is possibility of restricting further deterioration in the condition of the units and improvement in the performance of the units can be observed. The cost incurred in the need based R&M will be adjusted in the final expenditure plan for LROT. At the same time, additional power can be generated and made available to the beneficiaries. MPPGCL is making sincere efforts to finalize the LROT proposal in a period of about one year. Thereafter, the selected partner may need some time to finalize the investment / funding proposal, whereafter the same shall be immediately submitted before the Commission.

- (iii) The improvements which can be achieved with investment level of Rs.2200 Cr may not be expected from an investment level of Rs.335 Cr. The analysis of facts elaborated in the table below, will reveal that these units will be able to achieve / cross the targets set by the Commission only after comprehensive R&M and hence expecting further improvement beyond this limit, before incurring the required level of expenditure (Rs.2200 Cr) due to proposed investment of Rs.335 Cr, may not be proper.

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Particulars	PLF %	Aux Consumption %	Sp Oil Con ml/u	Heat rate K Cal/u
Average of past 3 year Actual Performance (FY 09-12)	58.15	10.76	4.72	3401
Target for FY 12 as per MPERC Norms	80	8	1.3	2700
<b>Targeted Performance after Comprehensive R&amp;M</b>	<b>85</b>	<b>8.5</b>	<b>1.3</b>	<b>2500-2650</b>

- (iv) The actual performance achieved by the unit 6 & 8, on which part of the proposal capital expenditure has been done by MPPGCL has demonstrated the improvements only to the extent as envisaged.

11. Since the financial and technical parameters for cost benefit analysis in the instant petition can be derived from main comprehensive R&M scheme estimated to Rs.2249.25 crores, the Detailed Project Report for the aforesaid comprehensive R&M scheme was sought from the petitioner.

12. The Commission observed the following from the DPR prepared by M/s NTPC for comprehensive R&M in Unit No.6 to 9 of STPS, Sarni :

- (i) The intent and objectives of R&M scheme as mentioned in Clause 8 in Sub-Section A of Section I of the DPR provides the following :

*“To meet the instructions/guidelines of MPERC, advised by MPPGCL and other points as the following :*

- a) Restoration of units to the original name plate rating.*
- b) Availability of 80% and improved reliability. Bringing down the station Heat rate to acceptable value of less than 2700 Kcal/Kwhr, preferably near **2500 Kcal/Kwhr.***
- c) Bringing down the specific Oil consumption to an acceptable value of **less than 1.3 ml/Kwhr.***
- d) To reduce Auxiliary Power Consumption to an acceptable level, preferably **below 8%.***
- e) To carry out cost benefit analysis for proposed R&M programme under various scenarios.*

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- f) *Compliance to statutory environmental norms.*
- g) *State of the art Control & Instrumentation.*
- h) *Improvement in plant safety.*
- i) *Overcoming the technological obsolescence.”*

- (ii) Techno-economic evaluation in Section IV of the DPR has provided the following post R&M performance parameters :

***Post R&M Performance parameters:***

<i>Post R&amp;M Life of plant</i>	<i>Years</i>	<i>20</i>
<i>Station Heat Rate</i>	<i>Kcal/kWh</i>	<i>2650</i>
<i>PLF</i>		<i>85%</i>
<i>Sp. Oil Consumption</i>	<i>ml/kWh</i>	<i>1.3</i>
<i>Auxiliary Power Consumption</i>		<i>8.5%</i>

- (iii) For gap analysis in Sub-Section ‘D’ of Section I of DPR, it is summarized in Clause 6 that “Unit Heat Rate is expected to be approximately **2485 kcal/kwh** with the evaluated losses in Boiler and Turbine cycles and proposed Retrofit/Up-gradation/Refurbishment solutions.”

It is further clarified in techno-economic evaluation under Section IV of the DPR at Clause 8 that “post R&M Unit Heat Rate of 2650 kcal/kwh has been assumed as the long term performance parameters with a margin of 6.50% over the projected heat rate of 2485 kcal/kwh targeted on completion of R&M, to take into account the deterioration over the extended life.”

- (iv) Regarding auxiliary power consumption and specific oil consumption, the above-mentioned para is followed by the following assumption:

*“APC 8.5% (in line with CERC 2009-14 tariff regulations) and Specific Oil Consumption of 1.30 ml/Kwh have been assumed as Post R&M parameters. These are also long term values considering deterioration with ageing of equipment as well as deterioration in parameters w.r.t. the design values.”*

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13. The Commission has come across the following facts and figures from the intent, objectives and techno-economic evaluation in the DPR and the clarifications/supplementary information filed by the petitioner :

- (a) The reasonableness of the cost estimates, IDC and cost benefit analysis as stipulated in Regulation 18.1 of the Tariff Regulations'2009 may not be ascertained in isolation of the main comprehensive R&M proposal since considerable technical improvements for a reasonable cost benefit analysis shall be achieved only after comprehensive R&M as informed by MPPGCL.
- (b) The estimated life extension of the proposed need based R&M works was not mentioned in the instant petition whereas the life extension of 20 years for the units after comprehensive R&M works is mentioned in the DPR for comprehensive R&M scheme.
- (c) The impact of improvements in all four units under subject petition needs to be seen after comprehensive R&M scheme only when the performance is envisaged either at par on some counts or even better on other counts. The targeted performance after comprehensive R&M as per the DPR and the petitioner is showing station heat rate as 2500 – 2650 kcal/kwh against the norms of 2700 kcal/kwh in the extant regulations.
- (d) The petitioner has mentioned in the petition that these need based R&M works are of urgent nature and necessary to run the units and to mitigate the power crisis in the state. The need based R&M, if not executed for want of comprehensive R&M, may lead to further deterioration in the condition of the units.
- (e) It is mentioned by the petitioner that the need based R&M works as proposed in the petition shall be deleted from the scope of comprehensive R&M proposal on completion of the same.
- (f) It has also been mentioned by the petitioner that the improvement in PLF and auxiliary consumption on execution of need based R&M would result in availability of additional power to the beneficiary of STPS, Sarni and this additional net generation would be available at cheaper rate as compared to the prevailing rate of short term and medium term power in the market.



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14. In view of the above and the targeted performance, as indicated in the DPR and informed by the petitioner after comprehensive R&M, the Commission hereby accords approval to the proposed need based R&M works of Rs.336.80 crores subject to the following conditions :

- a) The main comprehensive R&M scheme for Unit No.6, 7, 8 & 9 of STPS, Sarni shall be filed with the Commission within 24 months from the date of this order.
- b) The proposed need based R&M works shall be deleted from the main comprehensive R&M scheme.
- c) The post R&M operating parameters of the units shall be achieved as targeted in the DPR prepared by NTPC and informed by the petitioner.
- d) In case the main comprehensive R&M proposal for Unit No.6, 7, 8 & 9 of STPS, Sarni is not filed by the petitioner within 24 months from the date of this order, the approval of the subject capital expenditure towards need based R&M shall be limited to the eligibility of availing special allowance by MPPGCL for the aforesaid units for this period under Regulation 18.4 and 18.5 of Tariff Regulations, 2009 and its amendments at the rate specified in the extant Regulations for each year of control period.
- e) The amount of capital expenditure if any, claimed by the petitioner on completion of the need based R&M works during intervening period shall be adjusted in true-up exercise for the respective period in accordance with Para (d) above in case the conditions in sub-para (a) to (c) above are not fulfilled by the petitioner.

Ordered accordingly.

Sd/-  
**(Rakesh Sahni)**  
**Chairman**