CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 226/2009

Coram: **1. Dr. Pramod Deo, Chairperson**
2. Shri S.Jayaraman, Member
3. Shri V.S.Verma, Member
4. Shri M.Deena Dayalan, Member

DATE OF HEARING: 25.11.2010 **DATE OF ORDER 30.12.2011**

IN THE MATTER OF

Approval of tariff of Jhanor Gandhar Gas Power Station (657.39 MW) for the period from 1.4.2009 to 31.3.2014.

AND IN THE MATTER OF

NTPC Ltd, New Delhi ……**Petitioner**

Vs

(1) Madhya Pradesh Power Trading Company Ltd, Jabalpur
(2) Maharashtra State Electricity Distribution Co. Ltd, Mumbai
(3) Gujarat Urja Vikas Nigam Ltd, Vadodara
(4) Chhattisgarh State Power Distribution Co. Ltd, Raipur
(5) Electricity Department, Govt. of Goa, Panaji, Goa
(6) Electricity Department, Administration of Daman & Diu, Daman
(7) Electricity Department, Administration of Dadra and Nagar Haveli, Silvassa

...Respondents

Parties present:

1. Shri C.K.Mondal, NTPC
2. Shri Ajay Dua, NTPC
3. Shri A.S.Pandey, NTPC
4. Shri S.Jain, NTPC
5. Shri Manoj Dubey, MPPTCL

ORDER

This petition has been filed by NTPC, the petitioner herein, for approval of tariff of Jhanor Gandhar Gas Power Station (657.39 MW) (hereinafter referred to as "the generating station") based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter referred to as "the 2009 regulations”). Subsequently, the petitioner filed Interlocutory Application (I.A.No. 10/2010 on 3.2.2010 for amendment of Appendix-I of the petition after taking into consideration the impact of the judgment of the Tribunal dated 31.8.2007 in Appeal No. 35/2007 (against Petition No. 80/2005). The Commission by its order dated 21.7.2011 has considered the judgment of the Tribunal dated 31.8.2007 (and not 13.6.2007 as stated therein) and has revised the annual fixed charges of the generating station, subject to the final outcome of the Civil Appeals pending before the Hon'ble Supreme Court.

2. The generating station with a capacity of 657.39 MW comprises of three Gas Turbine units of 144.3 MW each and one Steam Turbine unit of 224.49 MW. The dates of commercial operation of different units of the generating station are as under:

	Date of Commercial operation (COD)
Unit-I (GT)	1.3.1995
Unit-II (GT)	1.7.1995
Unit-III (GT)	1.3.1995
Unit-IV (ST) / Generating station	1.11.1995

3. The tariff of the generating station for the period from 1.4.2004 to 31.3.2009 was determined by the Commission by its orders dated 15.12.2006 and 22.10.2007 in Petition No.80/2005 based on the capital cost of ₹239648.03 lakh as on 1.4.2004. No additional capital expenditure was claimed by the petitioner for the period 2004-09. Against the order dated 15.12.2006 in Petition No. 80/2005, the petitioner filed Appeal No. 35/2007 before the Appellate Tribunal for Electricity (‘the Tribunal’) on various issues. The Tribunal by its judgment dated 31.8.2007 allowed the prayer of the petitioner in the light of its decision contained in judgment dated 13.6.2007 in Appeal Nos.139 to 142 etc of 2006, 10, 11 and 23/2007 (NTPC-v-CERC & ors).

4. Subsequently, the Commission by its order dated 21.7.2011 in Petition No. 80/2005 revised the tariff of the generating station for the period 2004-09, in terms of the decision contained in the judgment of the Tribunal dated 31.8.2007 in Appeal No. 35/2007, subject to the final outcome of the Civil appeals filed by the Commission and pending before the Hon'ble Supreme Court. The annual fixed charges approved by the Commission for 2004-09 by order dated 21.7.2011 in Petition No. 80/2005 considering the revised capital cost of ₹240461.03 lakh as on 1.4.2004 is as under:

(₹ in lakh)

	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Interest on loan	7141.88	5745.41	4348.94	2952.47	1556.00
Interest on Working Capital	2229.06	2232.87	2238.39	2248.37	2376.15
Depreciation	11605.87	11605.87	11605.87	11605.87	11605.87
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00
Return on Equity	16832.27	16832.27	16832.27	16832.27	16832.27
O & M Expenses	5127.64	5331.43	5548.37	5765.31	5995.40
Total	**42936.72**	**41747.86**	**40573.85**	**39404.29**	**38365.69**

5. The interlocutory application (I.A. No. 10/2010) filed by the petitioner is disposed of in terms of the above.

6. The annual fixed charges claimed by the petitioner for the period 2009-14 is as under:

(₹ in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Depreciation	1296	2102	4241	6059	6700
Interest on Loan	775	1509	3314	4231	3813
Return on Equity	28154	28798	30341	31509	31870
Interest on Working Capital	5178	5262	5427	5541	5599
O&M Expenses	9729	10288	10873	11498	12155
Total	**45132**	**47959**	**54197**	**58838**	**60137**

7. Reply to the petition has been filed by the respondent No.1, MPPTCL**.**

CAPITAL COST

8. Regulation 7 (1) (a) of the 2009 regulations provides as under:

*"7. **Capital Cost.** (1) Capital cost for a project shall include: (a) the expenditure incurred or projected to be incurred, including interest during construction and financing charges, any gain or loss on account of foreign exchange risk variation during construction on the loan - (i) being equal to*

70% of the funds deployed, in the event of the actual equity in excess of 30% of the funds deployed, by treating the excess equity as normative loan, or (ii) being equal to the actual amount of loan in the event of the actual equity less than 30% of the funds deployed, up to the date of commercial operation of the project, as admitted by the Commission, after prudence check;"

9. The annual fixed charges claimed in the petition are based on opening capital cost of ₹239648 lakh as on 1.4.2009 as against the approved cost of ₹240461.03 lakh as on 31.3.2009. The petitioner vide its affidavit dated 29.4.2011 has furnished the value of capital cost and liabilities as on 1.4.2009 as per books of accounts in Form-9A. The details of liabilities and capital cost which have been reconciled with the records of the Commission are as under:

(₹ in lakh)

	As per Form-9A	**As per records of Commission**	**Difference**
Capital cost as on 1.4.2009, as per books	247846.46	247846.36	0.10
Liabilities included in the above	852.18	852.17	(-) 0.01

10. The difference in the capital cost of ₹0.10 lakh and the liabilities of (-) ₹0.01 lakh is on account of rounding errors. As such, the figures as per records of the Commission have been considered for the purpose of tariff.

11. The total liabilities included in the gross block, as on 1.4.2009 is ₹852.17 lakh. Out of this, un-discharged liabilities of ₹781.17 lakh (corresponding to capitalization allowed prior to 1.4.2004) has been included in the admitted capital cost of ₹240461.03 lakh (as on 31.3.2009) and the balance differential liabilities pertain to assets disallowed/ not claimed for capitalization.

12. The last proviso to Regulation 7 of the 2009 regulations, as amended on 21.6.2011, provides as under:

"Provided also that in case of the existing projects, the capital cost admitted by the Commission prior to 1.4.2009 duly trued up by excluding un-discharged liability, if any, as on 1.4.2009 and the additional capital expenditure projected to be incurred for the respective year of the tariff period 2009-14, as may be admitted by the Commission, shall form the basis for determination of tariff"

13. Clause (2) of Regulation 3 of the 2009 regulations define the term 'expenditure incurred" as under:

> *"expenditure incurred means the fund, whether the equity or debt or both, actually deployed and paid in cash or cash equivalent, for creation or acquisition of a useful asset and does not include commitments or liabilities for which no payment has been released"*

14. Accordingly, in terms of the last proviso to Regulation 7 read with Clause (2) of Regulation 3 of the 2009 regulations, as above, the capital cost as on 1.4.2009, after removal of un-discharged liabilities of ₹781.17 lakh, works out to ₹239679.86 lakh, on cash basis. However, the discharge of un-discharged liabilities, if any, made by the petitioner would be included in the capital base as additional capital expenditure, in the year of discharge.

15. Out of the un-discharged liabilities of ₹781.17 lakh deducted as on 1.4.2009, the petitioner has discharged liabilities of ₹0.35 lakh during the year 2009-10. Accordingly, the liabilities discharged amounting to ₹0.35 lakh is allowed during the year 2009-10, in addition to the additional capital expenditure.

Projected Additional Capital Expenditure

16. Regulation 9 of the 2009 regulations amended on 23.6.2011 provides as under:

> *"9. Additional Capitalization**.** (1) The capital expenditure incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:*
>
> *(i) Un-discharged liabilities;*
>
> *(ii) Works deferred for execution;*
>
> *(iii) Procurement of initial capital spares within the original scope of work, subject to the provisions of regulation 8;*
>
> *(iv) Liabilities to meet award of arbitration or for compliance of the order or decree of a court; and*
>
> *(v) Change in law:*
>
> *Provided that the details of works included in the original scope of work along with estimates of expenditure, undischarged liabilities and the works deferred for execution shall be submitted along with the application for determination of tariff.*

(2) The capital expenditure incurred on the following counts after the cut-off date may, in its discretion, be admitted by the Commission, subject to prudence check:

(i) Liabilities to meet award of arbitration or for compliance of the order or decree of a court;

(ii) Change in law;

(iii) Deferred works relating to ash pond or ash handling system in the original scope of work;

(iv) In case of hydro generating stations, any expenditure which has become necessary on account of damage caused by natural calamities (but not due to flooding of power house attributable to the negligence of the generating company) including due to geological reasons after adjusting for proceeds from any insurance scheme, and expenditure incurred due to any additional work which has become necessary for successful and efficient plant operation; and

(v) In case of transmission system any additional expenditure on items such as relays, control and instrumentation, computer system, power line carrier communication, DC batteries, replacement of switchyard equipment due to increase of fault level, emergency restoration system, insulators cleaning infrastructure, replacement of damaged equipment not covered by insurance and any other expenditure which has become necessary for successful and efficient operation of transmission system:

Provided that in respect sub-clauses (iv) and (v) above, any expenditure on acquiring the minor items or the assets like tools and tackles, furniture, air-conditioners, voltage stabilizers, refrigerators, coolers, fans, washing machines, heat convectors, mattresses, carpets etc. brought after the cut-off date shall not be considered for additional capitalization for determination of tariff w.e.f. 1.4.2009.

"(vi) In case of gas/ liquid fuel based open/ combined cycle thermal generating stations, any expenditure which has become necessary on renovation of gas turbines after 15 year of operation from its COD and the expenditure necessary due to obsolescence or non-availability of spares for successful and efficient operation of the stations.

Provided that any expenditure included in the R&M on consumables and cost of components and spares which is generally covered in the O&M expenses during the major overhaul of gas turbine shall be suitably deducted after due prudence from the R&M expenditure to be allowed.

(vii) Any capital expenditure found justified after prudence check necessitated on account of modifications required or done in fuel receipt system arising due to non-materialisation of full coal linkage in respect of thermal generating station as result of circumstances not within the control of the generating station.

(viii) Any undischarged liability towards final payment/ withheld payment due to contractual exigencies for works executed within the cut-off date, after prudence check of the details of such deferred liability, total estimated cost of package, reason for such withholding of payment and release of such payments etc."

17. The petitioner has claimed projected additional capital expenditure for the period 2009-14 as under:

(Rs in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Projected Additional Capital Expenditure	500.00	17792.00	26000.00	7163.00	3101.00

18. The cut-off date for the generating station has expired. Hence, the petitioner's claim for additional capital expenditure has to be examined in terms of Regulation 9(2) of the 2009 regulations. Accordingly, we examine the admissibility of the additional capital expenditure claim by the petitioner in the subsequent paragraphs.

Submissions of the petitioner

20. In its petition, the petitioner has submitted that the estimated capital expenditure claims are of the following nature:

(i) The additional capital expenditure (as per Regulation 9 (1) and 9 (2) of the Tariff Regulations, 2009) as per the original scope of work of the generating station which has been put to use;

(ii) The other additional capital expenditure in respect of the existing generating stations which have to be done on on-going basis.

21. The petitioner has also submitted that in addition to the capital expenditure covered by Regulation 9 (1) and 9(2) and 19(e) of the 2009 regulations, there will be capital expenditure of different nature which would be necessary for the efficient operation of the generating station within its life time. Additional capital expenditure for this purpose had constantly been allowed by the Commission under the 2001 and 2004 tariff regulations. However, additional capital expenditure on this head has not been included in Regulation 9 of 2009 regulations. Accordingly, the petitioner has claimed additional capital expenditure on 'works considered necessary for the efficient operation of the generating stations' in addition to those specified under Regulation 9 (1) and (2) and Regulation 19 (e) of the 2009 regulations.

22. The petitioner has further submitted that Regulation 3 (8) defines the capital cost to mean the capital cost as per Regulation 7. Regulation 7 deals with the capital cost of generating station which would come into operation between 1.4.2009 and 31.3.2014. Clause (b) of Regulation 7 (1) refers to the capitalized spares as specified in

Regulation 8 and Clause (c) refers to additional capitalization as determined under Regulation 9.

23. According to the petitioner, Regulations 7(1), 8 and 9 pertain to the capital cost of new generating station commissioned after 1.4.2009 and does not cover the existing projects commissioned prior to 1.4.2009. The petitioner has submitted that the last proviso to Regulation 7 is an independent provision dealing with the existing projects and additional capitalization for the existing projects was comprehensively covered by the said provision. Moreover, the term 'additional capital expenditure' defined in Regulation 3 (3) was the additional capital expenditure incurred or projected to be incurred, after the date of commercial operation of the project and admitted by the Commission after prudence check, subject to Regulation 9. According to the petitioner, the scope and meaning of additional capitalization was not confined to Regulation 9 but subject to Regulation 9 which would mean that if additional capitalization was of the nature as referred to in Regulation 9, it would be read subject to the provisions of Regulation 9 and if the additional capitalization was not of the nature as referred to in Regulation 9, the provisions of Regulation 9 could not be applied. The petitioner has also submitted that in respect of the existing projects, the additional capital expenditure projected to be incurred from 1.4.2009 till 31.3.2014 and admitted by the Commission after prudence check would qualify to be capitalized, notwithstanding the fact that this expenditure was not covered under Regulation 9 (1) and (2).

24. As Regulation 19 (e) provides for a compensation allowance to meet the expenses of new assets of capital nature including in the nature of minor assets, the petitioner has submitted that the normative compensation allowance under Regulation 19 (e) has no relevance to the additional capitalization of a substantive nature incurred by

the generating company from time to time. It has further submitted that as the Regulations 9 (1) and (2) and 19 (e) do not exclude the additional capital expenditure of substantial nature in respect of the existing generating stations, the additional capital expenditure as projected by the petitioner, to be incurred during the tariff period 2009-14 for the existing generating stations, may be considered and allowed by the Commission.

25. The petitioner by its affidavit dated 25.3.2010, has made its submissions on the admissibility of additional capitalization under the 2009 Regulations and has contended that the last proviso to Regulation 7 is an exception and deals with the existing projects. The petitioner has contended that the said proviso is an independent substantive proviso applicable to existing generating stations, independent of the other provisions of the Regulation 9 which was applicable to new generating stations, i.e. generating stations commissioned after 1.4.2009. The petitioner has further submitted that Regulations 7 (1) (b) and (c) controls Regulations 8 and 9 respectively, and therefore, was applicable only to new generating stations.

26. The respondent No.1, MPPTCL has objected to the submissions of the petitioner on the ground that the claim of the petitioner amounts to additional capitalization over and above the provisions contained in the provisions of the 2009 regulations. It has submitted that the claim of the petitioner may be restricted to the relevant provisions of the 2009 regulations. In reply, the petitioner has reiterated its submissions made in the petition and the affidavit dated 25.3.2010.

27. The above submissions have been made by the petitioner prior to the amendment of the 2009 regulations. The Commission has notified the CERC (Terms and Conditions of Tariff) (Second Amendment) Regulations, 2011 on 21.6.2011

incorporating the following provisions for additional capital expenditure under Regulation 9(2) of the 2009 regulations, as under:

> *(vi) In case of gas/liquid fuel based open/ combined cycle thermal generating stations, any expenditure which has become necessary on renovation of gas turbines after 15 year of operation from its COD and the expenditure necessary due to obsolescence or non-availability of spares for successful and efficient operation of the stations.*
>
> *Provided that any expenditure included in the R&M on consumables and cost of components and spares which is generally covered in the O&M expenses during the major overhaul of gas turbine shall be suitably deducted after due prudence from the R&M expenditure to be allowed.*
>
> *(vii) Any capital expenditure found justified after prudence check necessitated on account of modifications required or done in fuel receipt system arising due to non-materialisation of full coal linkage in respect of thermal generating station as result of circumstances not within the control of the generating station.*
>
> *(viii) Any un-discharged liability towards final payment/withheld payment due to contractual exigencies for works executed within the cut-off date, after prudence check of the details of such deferred liability, total estimated cost of package, reason for such withholding of payment and release of such payments etc."*

28. As the claims made by the petitioner relate to the CEA approved R&M of Gas Turbines of the generating station and a provision for consideration of expenditure on this count has been made under Regulation 9(2)(vi) of the 2009 regulations, amended on 21.6.2011, we do not express our views on the submissions made by the petitioner as above, in respect of this petition. Accordingly, we proceed to consider the claims of the petitioner in terms of Regulation 9(2) of the 2009 regulations, as amended on 21.6.2011.

29. The projected additional capital expenditure claimed by the petitioner [(inclusive of Interest During Construction (IDC) and Financing Charges (FC) etc.,] as under:

(₹ in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**Total**
Additional Capital expenditure claimed	500.00	16303.00	23677.00	6595.00	2870.00	**49945.00**
IDC + FC + contingency charges	0.00	1489.00	2323.00	568.00	231.00	**4611.00**
Projected Additional capital expenditure	**500.00**	**17792.00**	**26000.00**	**7163.00**	**3101.00**	**54556.00**

30. The category-wise break-up of the additional capital expenditure claimed by the petitioner is as stated overleaf:

(₹ in lakh)

Sl. No.	Head of Work/Equipment	Regulation	2009-10	2010-11	2011-12	2012-13	2013-14
1.	R&M of Gas Turbine	9(2)(ii)	0.00	11560.00	19191.00	3200.00	0.00
2.	GT Rotor Refurbishment	9(2)(ii)	500.00	0.00	3000.00	3180.00	2870.00
3.	Procurement of HP/LP Rotors of Steam Turbine	9(2)(ii)	0.00	1227.00	0.00	0.00	0.00
4.	Replacement of Stud of Parting Plane of HP Module of Steam Turbine	9(2)(ii)	0.00	0.00	0.00	148.00	0.00
5.	Air Inlet Cooling System for Gas Turbines	9(2)(ii)	0.00	795.00	0.00	0.00	0.00
6.	Renovation of Battery Bank for Main Plant and PLCC	9(2)(ii)	0.00	13.00	120.00	67.00	0.00
7.	Upgrading of Line Protection System by Replacing Existing RAZFE & LZ96 with Numerical Control Relays.	9(2)(ii)	0.00	100.00	0.00	0.00	0.00
8.	Upgrading of Generation Relay Panel	9(2)(ii)	0.00	23.00	195.00	0.00	0.00
9.	Generator Excitation System	9(2)(ii)	0.00	50.00	150.00	0.00	0.00
10.	Replacement of EA Bus I/O & Control Module in GT	9(2)(ii)	0.00	475.00	0.00	0.00	0.00
11.	Replacement of Vibration Monitoring, Speed Measuring & Turbine Supervisory Institute System for GT's, ST & Auxiliaries	9(2)(ii)	0.00	60.00	806.00	0.00	0.00
12.	Replacement of PLC of DM Plant & Offsite Systems	9(2)(ii)	0.00	0.00	215.00	0.00	0.00
13.	LP Inner Casing	9(2)(ii)	0.00	2000.00	0.00	0.00	0.00
14.	IDC + FC + Contingency not Included in Above	9(2)(ii)	0.00	1489.00	2323.00	568.00	231.00
	Total		**500.00**	**17792.00**	**26000.00**	**7163.00**	**3101.00**

31. The total claim for ₹54556.00 lakh as above comprises of ₹49945.00 lakh towards projected additional capital expenditure and ₹4611.00 lakh towards Interest During Construction (IDC), Financing charges (FC) and contingencies. We now examine the claim of the petitioner for additional Capital expenditure (after exclusion of IDC, FC and contingencies) in terms of Regulation 9(2)(ii) of the 2009 regulations as discussed in the subsequent paragraphs:

Change in law-Regulation 9(2) (ii)

32. The petitioner, in its petition has claimed the projected capital expenditure of ₹49945.00 lakh towards CEA approved R&M works under Regulation 9 [2] [ii] of the 2009 regulations. However, the claim for R&M of Gas Turbine (GT) and GT refurbishment is to the tune of ₹43501.00 lakh. CEA vide its letter dated 25.5.2009

had approved the above works for R&M of the generating station, amounting to ₹49945.00 lakh, which includes ₹2000.00 lakh for replacement of Inner Casing of Steam Turbine. The petitioner has submitted that the useful life of the combined cycle Gas Turbine plants have been increased to 25 years w.e.f 1.4.2009 under the 2009 regulations from the useful life of 15 years during the period 2004-09 when the R & M proposals were formulated and approved by CEA as per the 2004 Tariff Regulations. The petitioner by affidavit dated 26.4.2010 has submitted that for safe & reliable operation of gas plant on sustained basis and also to arrest performance deterioration due to ageing, such replacement of components of Gas Turbine is essential after a definite interval i.e. Equivalent Operating Hours (EOH), which may vary, based on the type of machine, fuel used & operating conditions etc. Most of the Gas Turbine manufacturers recommend extensive replacement of Hot Gas Path (HGP) components after one lakh hours of operation. Thus, in order to ensure Gas Turbine availability to full capacity and to avoid unforeseen failures of these machines, R & M of Gas Turbine has become necessary. Since, capitalization of expenditure on R&M of Gas turbines do not fall under Change-in-law, we do not consider the claim under Regulation 9(2)(ii) of the 2009 regulations.

33. Since the major portion of the projected additional capital expenditure is towards CEA approved R & M of Gas Turbines which have completed about 15 years of useful life and the same is based on the recommendations of the Original Equipment Manufacturer [OEM], we allow the claim of the petitioner for R&M of Gas Turbines in terms of Regulation 9(2)(vi) of the 2009 regulations, as amended on 21.6.2011, based on prudence check and after de-capitalization of the original gross value of replaced old assets.

34. Taking into consideration the submissions of the petitioner, the reply of the respondent and on scrutiny of the projected additional capital expenditure claimed, it is found that the claim of the petitioner includes expenditure towards the purchase of HP/LP rotors of the Steam turbine, LP inner casing, etc., in addition to the capital expenditure proposed to be incurred on the R&M of Gas Turbines. The admissibility for capitalization of these assets is discussed as under:

HP/LP rotors

35. The expenditure of ₹1227.00 lakh during 2010-11 towards HP/LP rotors, for Steam Turbine, is in the nature of purchase as spares and the same is not allowed to be capitalized.

LP inner casing

36. The expenditure of ₹2000.00 lakh during 2010-11 for replacement of LP inner casing which is required on account of erosion, which is not a normal phenomenon on account of part/low load operation of the turbine, is allowed to be capitalized under Regulation 9(2)(vi) of the 2009 regulations, for successful and efficient operation of the generating station.

37. The expenditure for ₹148.00 lakh during 2012-13 towards replacement of stud of parting plane of HP module of Steam Turbine has been justified by the petitioner on the ground that these are high-temperature fasteners which are subjected to high mechanical and thermal stresses during operation. The OEM had recommended the replacement of these fasteners after the useful life of 1,00,000 EOH. In view of this, the above expenditure is allowed for capitalization under Regulation 9(2)(vi) of the 2009 regulations.

38. Expenditure for ₹795.00 lakh during 2010-11 towards Air inlet cooling system for Gas Turbines has been claimed by the petitioner. Apart from increase in output,

inlet air cooling would also improve the Station Heat Rate (SHR). However, the benefit of improvement of SHR would be retained by the generator. Hence, there is no reason to allow such expenditure in the absence of any commitment on the part of the petitioner to pass on the benefit of improvement in efficiency to the respondent/beneficiaries.

39. The proposed expenditure for Gas Turbine rotor for ₹9550.00 lakh (₹500.00 lakh in 2009-10, ₹3000.00 lakh in 2011.12, ₹3180.00 lakh in 2012-13 and ₹2870.00 lakh during 2013-14), ₹200.00 lakh on electrical systems viz. renovation of battery bank of main plant and PLCC., ₹100.00 lakh for up-gradation of line protection system, ₹218.00 lakh for up-gradation of generation relay panel, ₹200.00 lakh for up-gradation of generator excitation system, ₹475.00 lakh towards the expenditure on Control & Instrumentation system such as Replacement of Control module in GT, ₹866.00 lakh towards replacement of vibration monitoring, speed measuring & turbine supervisory instrument system for GT, ₹215.00 lakh towards replacement of PLC of DM plant and have all been allowed under Regulation 9(2)(vi) of the 2009 regulations, since these assets provide significant contribution to the efficient operation and performance of the generating station.

40. The proposed expenditure on R&M of Gas Turbines involves the replacement of Hot Gas Path (HGP) components of Gas Turbines. The estimated expenditure during the different years is based on the revised R&M budget on 13.2.2007. It is observed that the petitioner intends to purchase one set each of HGP for all the turbines rows rotors blades, on the turbine vane rows, vane carriers, hot gas casings, exhaust casing, heat shield rows for rotor and stator etc. It is also noticed that the petitioner is procuring turbine rotor blades for rows 1, 2, 4 and 5 for GT-1 once again during 2011-12. Thus, it is evident that that the purchase of HGP components as proposed

by petitioner, also includes certain capital spares which are to be used in future. Since the R&M on GTs would be in the nature of major overhaul, suitable adjustment of capital spares included in the normative Operation & Maintenance expense is required. The expenditure on capital spares included in O&M corresponding to major overhaul is to the tune of ₹5877.00 lakh. This capital expenditure, other than the expenditure on refurbishing of Gas Turbine rotors is covered under O&M expenses, which includes at least one major overhaul, for each Gas Turbine during the period 2009-14. In view of this, the expenditure for ₹5877.00 lakh is deducted from the additional capital expenditure allowed during 2009-14.

41. Based on the above, the expenditure which has not been allowed to be capitalized out of the claim for ₹49945.00 lakh is as under:

(₹ in lakh)

Description	**Amount**
Expenditure on hot gas path components included in the O&M expenditure allowed to the station	5877.00
HP/LP rotors for the steam turbine which are of spares in nature	1227.00
Air inlet cooling system for Gas Turbines	795.00
Total	**7899.00**

42. However, against the claim for ₹43501.00 lakh towards R&M of Gas Turbine (GT) and GT refurbishment, only an amount of ₹37624.00 lakh is justified for consideration, after adjustment of ₹5877.00 lakh on Hot Gas Path components which has been found included in the normative O&M allowed to the generating station.

43. After adjustment of the amount of ₹7899.00 lakh, the expenditure for R&M of Gas Turbines & Steam Turbines allowed for the purpose of tariff is ₹42046.00 lakh (excluding contingency & IDC etc,) prior to the deduction of the gross value of the assets replaced.

Basis adopted by petitioner for arriving at the value of de-capitalization

44. The petitioner had earlier submitted that the de-capitalization value of old assets may be considered as 50% of the estimated value of new assets. Subsequently, in its affidavit dated 24.8.2010 in I.A.10/2010 to the petition, the petitioner has submitted the estimated value of de-capitalization as ₹17200.00 lakh against the capitalization of ₹39300.00 lakh towards R&M of Gas Turbines which had been worked out on the basis of billing rate provided in the Main Plant Contract. The petitioner has also submitted the "Procedure adopted for calculation of de-capitalization amount for R&M" as under:

- The base value of items replaced has been arrived based on the billing break-up provided in the Main Plant contract.
- The percentage of components covered under R&M is 53.04% for Thermal Block and 31.99% for Combustion chamber which is to be applied on the components being proposed to be replaced for de-capitalization.
- The items under instrumentation and relay package were 2.5% of the value of the Generator and de-capitalization was 90% of this 2.5 %.
- The items under Excitation system were part of price covered under the head Generator Excitation System and components covered under R&M is 10%of the Generator excitation System & the de-capitalization value is 90% of this10%.
- The PLC system of DM plant were part of DM plant package and components covered under R&M is 5% & the de-capitalization value is 90% of this 5% cost.

45. The de-capitalization value furnished by the petitioner was based on the billing rate and the petitioner had not worked out the amount of de-capitalization corresponding to the gross value of the assets in books of accounts. The billing rate is different from the gross value of the plant and hence could not be taken as gross value of old asset. The gross value of an asset would mean the 'Book value' as recorded on the books of the company or financial reports which includes the cost escalation, cost of additional works, FERV, IDC & FC, taxes, duties etc. In view of this, the petitioner was directed to submit the gross value of the GTs as on the date of

commercial operation. However, the petitioner could not furnish the gross value as on the date of commercial operation of the GTs. It was submitted that since the individual gross block of assets were not available, the petitioner had to rely on the value of billing break-up provided in the main plant contract. To justify its claim, the petitioner vide its affidavit dated 21.10.2010 has furnished the indicative prices of GTs of a similar make, which was supplied during 1992, from the Gas Turbine World (GTW) Handbook (Volume-27).

46. As it was observed that the billing rates based on the Letter of Award (LOA) value do not include escalation during the construction period, taxes & duties, transportation cost, IDC & FC, IEDC etc., the petitioner was directed to furnish the following information:

> *" The estimated gross value of assets to be replaced based on the billing rate taking into account the escalation for the period from the date of Letter of Award to the date of actual payment and corresponding IDC , IEDC, FERV etc. as on COD taken into books of account. Further, Complete details and details of working should also be submitted. "*

47. The petitioner vide its affidavit dated 13.1.2011 has furnished the C & F value ex-Works Supply and Erection cost of the main plant package along with custom duty at the rate of 20% and Finance & Insurance charges on the date of Letter of Award (LOA). The petitioner has also furnished the price variation from the date of LOA to actual payment and the corresponding IDC, IEDC, FERV etc. as on the date of commercial operation taken into books of accounts, along with detailed workings. The cost of main plant package after taking into account the price variation, IDC, IEDC, etc. as furnished by the petitioner works out to ₹1187.45 crore. Ministry of Power, Government of India in its tariff notification dated 28.4.1997 had considered the project cost of ₹2329.21 crore, which included initial spares of ₹106.22 crore as on 31.3.1996. Thus, if the cost of main plant package as on the date of commercial operation is considered as ₹1187.45 crore, as furnished by the petitioner vide affidavit

dated 13.1.2011, which includes cost of 3 GTs, 3 Waste Heat recovery boilers, one ST along with GT & ST auxiliaries and control and instrumentation system, then the cost of remaining works such as all civil works, switchyard, cooling water system, DM plant etc., works out as ₹1141.76 crore ₹(2329.21-1187.45) crore which appears to be higher.

48. To substantiate that the value of main plant package is lower, it could be observed from the petition (Petition No. 80/2005) filed by the petitioner for determination of tariff for the period 2004-09, that out of the total gross block of ₹2332.99 crore as on 31.3.2004 (as mentioned in Form-12 for calculation of depreciation), the gross block of PLCC, C & I and telemetering equipments had been shown as ₹1067.62 crore and other Plant & Machineries as ₹855.46 crore, which work out to a total of ₹1923.08 crore and the balance amount of ₹409.91 crore is in respect of other assets such as land, roads, buildings, equipments & pipelines, cooling water tower, service station equipments, ducts, electrical auxiliaries, power supply system , workshop, fire fighting etc. It could be inferred that the gross block of ₹1923.08 crore against assets like PLCC, C & I and telemetering equipments, other plant & machineries includes all the main packages like GT, ST, boiler, generator etc., along with its auxiliaries. From the report of August, 2002 based on the Field Survey conducted during August 2001 and available with the Commission, it is noticed that the actual expenditure on imported component was 49,868 million Japanese Yen, which works out to ₹1645.64 crore, and includes all the main packages viz. GTG (Gas Turbines & Generator), STG (Steam Turbine & Generator, Steam Generator (Boiler) along with its auxiliaries and Control & Instrumentation system as the supply, erection, testing and commissioning of the main plant equipment was under taken on turn-key basis by the consortium consisting of M/s ABB and Marubeni. In the said report, the domestic component cost has been mentioned as 24,000 million

Japanese Yen, which works out to ₹792.00 crore. Thus, it is apparently clear that the main plant package cost would be ₹1650.00 crore (approx), even if the gross block of ₹1923.08 crore as on 31.3.2004, as mentioned by the petitioner after exclusion of the cost of PLCC, telemetering and some other domestic supply equipments is considered. Accordingly, the estimated gross value of main plant package is considered as ₹1650.00 crore for the purpose of de-capitalization.

49. It is observed from the contents of the Gas Turbine World Hand Book 2009 that 1/3rd of the cost of main plant package of a Combined Cycle Power Project cost is towards the Gas Turbine and its associated auxiliaries. Based on this principle, the cost of GTs works out to ₹550.00 crore (approx), which consists mainly of thermal block and combustion chamber. The percentage of components covered under R&M is 53.04% for Thermal Block and 31.99% for Combustion Chamber. As it is difficult to segregate the value of Rs. 550.00 crore for Gas Turbines towards Thermal Block and Combustion Chamber, the weighted average of 53.04% and 31.99% (i.e. 50.5%) in line with the petitioner's computation based on LOI prices has been considered as a percentage of GTs covered under R&M. Accordingly, the weighted average of 50.5% of the cost of GTs for ₹550.00 crore which works out to ₹277.75 crore has been considered for de-capitalization against the claim for capitalization of ₹435.01 crore (which includes the cost of GTs +Combustion Chamber + GT Rotor refurbishment) towards R&M for the period 2009-14. This methodology has been adopted for this generating station in the absence of clear details pertaining to gross block of the main plant package and the same shall not form precedent in future.

Value of de-capitalization considered for the purpose of tariff

50. Based on the above discussions, against the claim for capitalization of ₹43501.00 lakh (towards R&M of GT and GT refurbishment) an amount of

₹37624.00 lakh (after adjustment towards Hot Path Gas component of ₹5877.00 lakh) is justified to be considered for Thermal block and Combustion chamber. Accordingly, the corresponding value for de-capitalization of R&M of GT *plus* combustion chamber *plus* GT refurbishment, works out to ₹24023.00 lakh (₹27775 lakh x ₹37624 lakh/ ₹43501 lakh), which has been considered for the purpose of tariff. However, the total value of de-capitalization along with other assets works out to ₹25028.80 lakh. Accordingly, out of the additional capitalization of ₹42046.00 lakh allowed towards R&M of GT & ST, only an amount of ₹17017.20 lakh for 2009-14 is allowed after de-capitalization of the gross value of old assets, by apportioning the gross de-capitalization value of ₹25028.80 lakh in the ratio of the yearly gross value of the admitted additional capital expenditure. The summary of the net additional capital expenditure allowed is as under:

(₹ in lakh)

Head of Work/ Equipments	**Actual/Projected additional capital expenditure allowed**					**Total package justified for consideration**
	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**	After adjustment of capital spares of Rs. 5877 lakh. from the expenditure claimed on R&M of GT during 2010-11 & 2011-12 included in the normative O&M
R&M of Gas Turbine	0.00	8256.00	13705.00	2897.00	0.00	24858.00
Combustion Chamber	0.00	1095.00	1818.00	303.00	0.00	3216.00
GT Rotor Refurbishment	500.00	0.00	3000.00	3180.00	2870.00	9550.00
Procurement of HP/LP Rotors of Steam Turbine.	0.00	0.00	0.00	0	0.00	0.00
Replacement of Stud of Parting Plane of HP Module of Steam Turbine	0.00	0.00	0.00	148.00	0.00	148.00
Air Inlet Cooling System for Gas Turbines.	0.00	0.00	0.00	0.00	0.00	0.00
Renovation of battery Bank for main plant and PLCC	0.00	13.00	120.00	67.00	0.00	200.00
Upgrading of line protection system by replacing existing RAZFE & LZ96 with numerical control relays.	0.00	100.00	0.00	0.00	0.00	100.00
Upgrading of Generation Relay Panel	0.00	23.00	195.00	0.00	0.00	218.00
Generator Excitation System	0.00	50.00	150.00	0.00	0.00	200.00
Replacement of EA Bus I/o &	0.00	475.00	0.00	0.00	0.00	475.00

Control Module in GT						
Replacement of vibration monitoring, speed measuring & turbine supervisory instt. System for GT's, ST & Aux equipment	0.00	60.00	806.00	0.00	0.00	866.00
Replacement of PLC of DM Plant & Offsite Systems.	0.00	0.00	215.00	0.00	0.00	215.00
LP inner casing	0.00	2000.00	0.00	0.00	0.00	2000.00
Total Additional capital expenditure allowed	**500.00**	**12071.69**	**20009.31**	**6595.00**	**2870.00**	**42046.00**
Less: De-capitalisation allowed	319.25	6688.23	11991.97	4196.84	1832.50	25028.80
Total Additional capital expenditure allowed after de-capitalisation	**108.75**	**5383.46**	**8017.34**	**2398.16**	**1037.50**	**17017.20**

IDC, FC, Contingencies & Discharge of liabilities

51. As regards the petitioner claim for ₹4611.00 lakh towards IDC, FC and contingencies, the same has been allowed in proportion to the admitted additional capital expenditure. Further, considering the discharge of liabilities as additional capital expenditure, the revised additional capital expenditure allowed for the purpose of tariff is as under:

(₹ in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**Total**
Additional capital expenditure allowed	500.00	12071.69	20009.31	6595.00	2870.00	42046.00
Less: De-capitalization allowed	319.25	6688.23	11991.97	4196.84	1832.50	25028.80
Projected additional capital expenditure allowed (prior to IDC, FC & contingencies)	180.75	5383.46	8017.34	2398.16	1037.50	17017.20
Add: IDC, FC & contingencies on pro-rata basis	0.00	1102.54	1963.16	568.00	231.00	3864.70
Net Additional capital expenditure before discharge of liabilities	180.75	6486.00	9980.49	2966.16	1268.50	20881.90
Add: Discharges of liabilities	0.35	0.00	0.00	0.00	0.00	0.35
Net Additional capital expenditure allowed	**181.10**	**6486.00**	**9980.49**	**2966.16**	**1268.50**	**20882.25**

Capital Cost for 2009-14

52. Based on the above, the capital cost considered for the purpose of tariff for 2009-14 is as stated overleaf:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Opening Capital cost	239679.86	239860.96	246346.96	256327.45	259293.61
Projected Additional capital expenditure	181.10	6486.00	9980.49	2966.16	1268.50
Closing Capital cost	**239860.96**	**246346.96**	**256327.45**	**259293.61**	**260562.11**
Average Capital cost	**239770.41**	**243103.96**	**251337.21**	**257810.53**	**259927.86**

Debt-Equity Ratio

53. Regulation 12 of the 2009 regulations provides as under:

> *"(1) For a project declared under commercial operation on or after 1.4.2009, if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.*
>
> *Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff.*
>
> *Provided further that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.*
>
> *Explanation.- The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, provided such premium amount and internal resources are actually utilized for meeting the capital expenditure of the generating station or the transmission system.*
>
> *(2) In case of the generating station and the transmission system declared under commercial operation prior to 1.4.2009, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2009 shall be considered.*
>
> *(3) Any expenditure incurred or projected to be incurred on or after 1.4.2009 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernization expenditure for life extension shall be serviced in the manner specified in clause (1) of this regulation."*

54. The gross loan and equity amounting to ₹120230.51 lakh each, as considered in order dated 21.7.2011 in Petition No. 80/2005, has been considered as gross loan and equity as on 1.4.2009. However, un-discharged liabilities of ₹781.17 lakh included in the capital cost as on 1.4.2004 has been adjusted to debt and equity in the ratio of 50:50. As such the gross normative loan and equity as on 1.4.2009 works out to ₹119839.93 lakh each. Further, the projected additional expenditure admitted above has been allocated in the debt-equity ratio of 70:30. This is subject to truing-up in terms of Regulation 6 of the 2009 regulations.

Return on Equity

55. Regulation 15 of the 2009 regulations provides as under:

"(1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 12.

(2) Return on equity shall be computed on pre-tax basis at the base rate of 15.5% to be grossed up as per clause (3) of this regulation.

Provided that in case of projects commissioned on or after 1st April, 2009, an additional return of 0.5% shall be allowed if such projects are completed within the timeline specified in Appendix-II.

Provided further that the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever.

(3) The rate of return on equity shall be computed by grossing up the base rate with the Minimum Alternate/Corporate Income Tax Rate for the year 2008-09, as per the Income Tax Act, 1961, as applicable to the concerned generating company or the transmission licensee, as the case may be.

(4) Rate of return on equity shall be rounded off to three decimal points and be computed as per the formula given below:

Rate of pre-tax return on equity = Base rate / (1-t)

Where t is the applicable tax rate in accordance with clause (3) of this regulation.

(5) The generating company or the transmission licensee, as the case may be, shall recover the shortfall or refund the excess Annual Fixed Charge on account of Return on Equity due to change in applicable Minimum Alternate/Corporate Income Tax Rate as per the Income Tax Act, 1961 (as amended from time to time) of the respective financial year directly without making any application before the Commission:

Provided further that Annual Fixed Charge with respect to the tax rate applicable to the generating company or the transmission licensee, as the case may be, in line with the provisions of the relevant Finance Acts of the respective year during the tariff period shall be trued up in accordance with Regulation 6 of these regulations."

56. Accordingly, return on equity has been worked out @23.481% per annum on the normative equity after accounting for projected additional capital expenditure admitted above.

(₹ in lakh)

	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Notional Equity- Opening	119839.93	119894.26	121840.06	124834.21	125724.05
Addition of Equity due to Additional capital expenditure	54.33	1945.80	2994.15	889.85	380.55
Normative Equity-Closing	119894.26	121840.06	124834.21	125724.05	126104.60
Average Normative Equity	119867.09	120867.16	123337.13	125279.13	125914.33
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Tax Rate for the year 2008-09	33.990%	33.990%	33.990%	33.990%	33.990%
Rate of Return on Equity (Pre Tax)	23.481%	23.481%	23.481%	23.481%	23.481%
Return on Equity (Pre Tax)-(*annualised)*	**28145.99**	**28380.82**	**28960.79**	**29416.79**	**29565.94**

Interest on loan

57. Regulation 16 of the 2009 regulations provides as under*:*

‘(1) The loans arrived at in the manner indicated in regulation 12 shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2009 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2009 from the gross normative loan.

3) The repayment for the year of the tariff period 2009-14 shall be deemed to be equal to the depreciation allowed for that year.

(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio at the beginning of each year applicable to the project.

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered.

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.

(8) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.

(9) In case of dispute, any of the parties may make an application in accordance with the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999, as amended from time to time, including statutory re-enactment thereof for settlement of the dispute.

Provided that the beneficiary or the transmission customers shall not withhold any payment on account of the interest claimed by the generating company or the transmission licensee during the pendency of any dispute arising out of re-financing of loan.”

58. The interest on loan has been worked out as under:

(a) The gross normative loan of ₹119839.93 lakh as on 1.4.2009 has been considered.

(b) Cumulative repayment of ₹114820.25 lakh as on 31.3.2009 as considered in order dated 21.7.2011 in Petition No. 80/2005 has been considered as cumulative repayment as on 1.4.2009. However, after taking in to account the proportionate adjustment to the cumulative repayment on account of un-discharged liabilities deducted from the capital cost as on 1.4.2009, the cumulative repayment as on 1.4.2009 is revised to ₹114447.25 lakh.

(c) Accordingly, the net normative opening loan as on 1.4.2009 works out to ₹5392.68 lakh.

(d) Addition to normative loan to the tune of 70% of additional capital expenditure approved above has been considered on year to year basis.

(e) Depreciation allowed has been considered as repayment of normative loan during the respective year of the tariff period 2009-14. Further, proportionate adjustment has been made to the repayments on account of de-capitalizations/discharge of liabilities considered in the projected additional capital expenditure approved above.

(f) The petitioner has considered originally contracted GOI loans as actual loan portfolio for the purpose of calculating weighted average rate of interest. However, these GOI loans were refinanced with Bonds earlier. As such, these Bonds represent the actual loan portfolio as existing on 1.4.2009. Accordingly, in line with the provisions of Regulation 16 (5), weighted average rate of interest has been calculated considering the actual loan portfolio comprising of Bonds XIII Series A & B existing as on 1.4.2009 as shown at annexure-I.

59. The necessary calculation for interest on loan is as under:

(₹ in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Gross opening loan	119839.93	119966.70	124506.90	131493.24	133569.55
Cumulative repayment of loan up to previous year	114447.25	115164.29	111643.94	105370.13	105850.35
Net Loan Opening	5392.68	4802.41	12862.96	26123.12	27719.20
Addition due to Additional capitalisation	126.77	4540.20	6986.35	2076.31	887.95
Repayment of loan during the year	940.35	1161.42	2120.57	3418.02	3896.83
Less: Repayment adjustment on account of de-capitalization	223.48	4681.76	8394.38	2937.79	1282.75
Add: Repayment adjustment on account of discharges of liabilities	0.17	0.00	0.00	0.00	0.00
Net Repayment	717.04	(-) 3520.35	(-) 6273.81	480.23	2614.08
Net Loan Closing	4802.41	12862.96	26123.12	27719.20	25993.07
Average Loan	5097.55	8832.68	19493.04	26921.16	26856.13
Weighted Average Rate of Interest on Loan	9.5800%	9.5800%	9.5800%	9.5800%	9.5800%
Interest on Loan	**488.35**	**846.17**	**1867.43**	**2579.05**	**2572.82**

Depreciation

60. Regulation 17 of the 2009 regulations provides as under:

"(1) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission.

(2) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset.

Provided that in case of hydro generating stations, the salvage value shall be as provided in the agreement signed by the developers with the State Government for creation of the site.

Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciable value shall correspond to the percentage of sale of electricity under longterm power purchase agreement at regulated tariff.

(3) Land other than the land held under lease and the land for reservoir in case of hydro generating station shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the asset.

(4) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-III to these regulations for the assets of the generating station and transmission system.

Provided that, the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation shall be spread over the balance useful life of the assets.

(5) In case of the existing projects, the balance depreciable value as on 1.4.2009 shall be worked out by deducting the cumulative depreciation including Advance against Depreciation as admitted by the Commission upto 31.3.2009 from the gross depreciable value of the assets.

(6) Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis."

Balance useful life of the generating station as on 1.4.2009 after R&M for the purpose of Depreciation

61. The details of the date of commercial operation of the different units of the generating station, the period of operation up to 1.4.2009 and 1.4.2012 (completion of major R&M works) and the extended life after R&M of Gas Turbine and their weighted average period of operation on above dates and weighted average life are as under:

Description	Capacity MW	COD	Elapsed life up to 1.4.2009	Elapsed life as on 1.4.2012	Useful life after extension of life by 15 years for GTs
GT-I	144.30	1.3.1995	14.08	17.08	32.08
GT-II	144.30	1.7.1995	13.75	16.75	31.75
GT-III	144.30	1.3.1995	14.08	17.08	32.08
ST-I	224.49	1.11.1995	13.42	16.42	25.00
Total	**657.39**		**13.78**	**16.78**	**29.59**

62. The weighted average of the elapsed life (period of operation) of the generating station, as on 1.4.2009 works out to 13.78 years. The major part of R&M works would be completed by 31.3.2012. The weighted average of the period of operation of the generating station as on 1.4.2012 works out to 16.78 years. After the completion of R&M, the life of the Gas Turbine shall be extended by 15 years (approx) from the date

of completion of major R&M i.e from 1.4.2012. However, the useful life of the Steam Turbine shall remain as 25 years from the date of commercial operation of the Steam Turbine unit.

63. The Cumulative depreciation as on 31.3.2009 as per order dated 21.7.2011 in Petition No. 80/2005 is ₹201352.18 lakh. Further, proportionate adjustment has been made to the cumulative depreciation on account of un-discharged liabilities deducted as on 1.4.2009. Accordingly, the revised cumulative depreciation as on 1.4.2009 works out to ₹200698.06 lakh. The value of freehold land as considered in said order as on 31.3.2009 is ₹255.00 lakh and the same has been considered for the purpose of calculating depreciable value. Accordingly, the balance depreciable value (before providing depreciation) for the year 2009-10 works out to ₹14865.80 lakh.

64. As stated above, the elapsed life of the generating station as on 1.4.2009 is 13.78 years and the balance useful life of generating station as on 1.4.2009 is 15.81 years (29.59-13.78), after taking into account the major R&M expenditure incurred by the petitioner. Since, the elapsed life of the generating station of 13.78 years is more than the ceiling limit of 12 years (for normal depreciation) as on 1.4.2009, the balance depreciable value for each year has been spread over the remaining useful life for the purpose of calculating depreciation for the respective years. Further, proportionate adjustment has been made to the cumulative depreciation on account of de-capitalization of assets considered for the purpose of tariff as well as discharges/reversal of liabilities out of un-discharged liabilities deducted from capital cost as on 1.4.2009. The necessary calculations in support of depreciation are as stated overleaf:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Opening capital cost	239679.86	239860.96	246346.96	256327.45	259293.61
Closing capital cost	239860.96	246346.96	256327.45	259293.61	260562.11
Average capital cost	239770.41	243103.96	251337.21	257810.53	259927.86
Depreciable value @ 90%	215563.87	218564.06	225973.98	231799.98	233705.57
Remaining useful life at the beginning of the year	15.81	14.81	13.81	12.81	11.81
Balance depreciable value	14865.80	17199.17	29282.47	43780.67	46016.90
Depreciation (annualized)	**940.35**	**1161.42**	**2120.57**	**3418.02**	**3896.83**
Cumulative depreciation at the end	201638.42	202526.31	198812.09	191437.33	191585.51
Less: Cumulative depreciation reduction due to de-capitalization	273.82	5834.79	10792.77	3748.65	1649.25
Add: Cumulative depreciation adjustment on account of discharges	0.29	0.00	0.00	0.00	0.00
Cumulative depreciation after adjustment due to de-capitalization (at the end of the period)	201364.89	196691.52	188019.31	187688.67	189936.26

O&M Expenses

65. Clause (c) of Regulation 19 of Regulation of the 2009 regulations provide the following O&M expense norms for Open Cycle Gas Turbine / Combined Cycle generating stations as under:

(₹ in lakh/MW)

	2009-10	2010-11	2011-12	2012-13	2013-14
O&M expenses for 500 MW units	**14.80**	**15.65**	**16.54**	**17.49**	**18.49**

66. The petitioner has claimed the following O&M expenses during 2009-14:

(₹in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
O&M expenses	9729	10288	10873	11498	12155

67. Based on above norms, the Operation & Maintenance expenses claimed by the petitioner are allowed as under:

(₹in lakh)

	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**
O&M expenses	9729.37	10288.15	10873.23	11497.75	12155.14

Target Availability

68. The Target Availability of the generating station is considered as 85% for the period 1.4.2009 to 31.3.2014.

Interest on Working Capital

69. Regulation 18(1)(b) of the 2009 regulations provides that the working capital for Open-cycle Gas Turbine/Combined Cycle thermal generating stations shall cover:

> *(i) Fuel cost for one month corresponding to the normative annual plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(ii) Liquid fuel stock for ½ month corresponding to the normative annual plant availability factor, and in case of use of more than one liquid fuel, cost of main liquid fuel.*
>
> *(iii)Maintenance spares @ 30% of operation and maintenance expenses specified in regulation 19.*
>
> *(iv)Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel, and*
>
> *(v) Operation and maintenance expenses for one month.*

70. Clause (3) of Regulation 18 of the 2009 regulations as amended on 21.6.2011 provides as under:

> *"Rate of interest on working capital shall be on normative basis and shall be considered as follows:*
>
> *(i) SBI short-term Prime Lending Rate as on 01.04.2009 or on 1st April of the year in which the generating station or unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the unit or station whose date of commercial operation falls on or before 30.06.2010.*
>
> *(ii) SBI Base Rate plus 350 basis points as on 01.07.2010 or as on 1st April of the year in which the generating station or a unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the units or station whose date of commercial operation lies between the period 01.07.2010 to 31.03.2014.*
>
> *Provided that in cases where tariff has already been determined on the date of issue of this notification, the above provisions shall be given effect to at the time of truing up.*

71. Working capital has been calculated considering the following elements:

Fuel Cost and Energy charges

72. The petitioner has claimed the cost for fuel component in working capital in the Petition based on price and GCV of APM and RLNG gas for the preceding three months from January, 2009 to March, 2009. The percentage of scheduled generation achieved by the generating station through the mode of operation by APM, RLNG gas

during 2008-09 was 65.61% and 34.39% respectively. The same has been used to arrive at the Fuel component (for one month) and the Energy Charges (for two months) for the purpose of working capital. The petitioner has not considered any liquid fuel for the purpose of working capital. Accordingly, Fuel component (one month) and Energy charges (for two months) considered is as under:

(₹ in lakh)

	2009-10	2010-11	2011-12 (leap year)	2012-13	2013-14
Fuel Cost for one month	10339.99	10339.99	10368.32	10339.99	10339.99
Energy charges for 2 months	20679.97	20679.97	20736.63	20679.97	20679.97

73. The claim of the petitioner as above, for cost of fuel is found to be in order and has been considered for the purpose of tariff.

Maintenance Spares

74. The petitioner has claimed the following maintenance spares in the working capital.

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Cost of maintenance spares	2919.00	3086.00	3262.00	3449.00	3647.00

75. The 2009 regulations provide for maintenance spares @ 30% of the operation and maintenance expenses as specified in Regulation 19. Accordingly, the maintenance spares for the purpose of tariff is worked out as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Cost of maintenance spares	2918.81	3086.45	3261.97	3449.33	3646.54

Receivables

76. Receivables have been worked out on the basis of two months of fixed and energy charges (based on primary fuel only) as stated overleaf:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Variable Charges -2 months	20679.97	20679.97	20736.63	20679.97	20679.97
Fixed Charges - 2 months	7411.46	7649.45	8191.06	8719.94	8942.83
Total	**28091.44**	**28329.42**	**28927.69**	**29399.92**	**29622.80**

O&M Expenses

77. O&M expense for 1 month for the purpose of working capital is allowed as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
O & M for 1 month	810.78	857.35	906.10	958.15	1012.93

78. SBI PLR of 12.25% has been considered in the computation of the interest on working capital. Necessary computations in support of calculation of interest on working capital are as under as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Fuel Cost (APM & RLNG) – 1 month	10339.99	10339.99	10368.32	10339.99	10339.99
Liquid fuel stock –1/ 2 month	0.00	0.00	0.00	0.00	0.00
Maintenance Spares	2918.81	3086.45	3261.97	3449.33	3646.54
O&M expenses – 1 month	810.78	857.35	906.10	958.15	1012.93
Receivables – 2 months	28091.44	28329.42	28927.69	29399.92	29622.80
Total working capital	**42161.02**	**42613.20**	**43464.08**	**44147.38**	**44622.26**
Rate of interest	12.2500%	12.2500%	12.2500%	12.2500%	12.2500%
Interest on working capital	**5164.72**	**5220.12**	**5324.35**	**5408.05**	**5466.23**

Annual Fixed charges for 2009-14

79. The annual fixed charges for the period 2009-14 in respect of the generating station are summarized as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	940.35	1161.42	2120.57	3418.02	3896.83
Interest on Loan	488.35	846.17	1867.43	2579.05	2572.82
Return on Equity	28145.99	28380.82	28960.79	29416.79	29565.94
Interest on Working Capital	5164.72	5220.12	5324.35	5408.05	5466.23
O&M Expenses	9729.37	10288.15	10873.23	11497.75	12155.14
Total	**44468.78**	**45896.68**	**49146.37**	**52319.66**	**53656.96**

Note: *(i) All figures are on annualized basis.(ii) All the figures under each head have been rounded. (ii) The figure in total column in each year is also rounded. Because of rounding of each figure the total may not be arithmetic sum of individual items in columns.*

80. The annual fixed charges as calculated above shall be trued up at the end of the tariff period as per the provisions of Regulation 6 of the 2009 regulations.

Energy /Variable Charge

81. Sub-clause (a) of clause (6) of Regulation 21of the 2009 regulations provides that the Energy Charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal places in accordance with the formulae as under:

For gas and liquid fuel based stations

ECR = {(GHR x LPPF x 100/ {CVPF x (100 – Aux)}

Where,

AUX = Normative auxiliary energy consumption in percentage.

CVPF = Gross calorific value of primary fuel as fired, in kCal per kg, per litre or per standard cubic metre, as applicable.

ECR = Energy charge rate, in Rupees per kWh sent out.

GHR = Gross station heat rate, in kCal per kWh.

LPPF = Weighted average landed price of primary fuel, in Rupees per kg, per litre or per standard cubic metre, as applicable, during the month.

82. The petitioner has claimed an Energy Charge Rate (ECR) of 261.33 paisa/kWh. The Energy charge rate has been computed based on the weighted average rate price, GCV of fuel procured and burnt for the preceding three months of January, February and March, 2009 and the operational norms, as under:

Description	**Unit**	**2009-14**	
Capacity	MW	657.39	
Gas		**APM**	**RLNG**
Normative Heat Rate	Kcal/kWh	2040	2040
Aux. Energy Consumption	%	3	3
Weighted average rate of fuel	Rs/1000 SCM	5875.50	24255.66
Weighted average GCV of fuel	Kcal/SCM	9766.56	9838.14
Rate of energy charge ex-bus	Paise/kWh	126.52	518.51
Mode of Operation on Fuel during 2008-09 (% of schedule generation)	%	65.61	34.39
ESO in one month @ 85% PLF	MUs	259.60	136.07
Weighted average cost of fuel in 2008-09 (Ex-Bus)	Paise/kWh	**261.326**	

83. The Energy Charge Rate claimed by the petitioner, based on the operational norms specified by the Commission, which works out to 261.326 paise/kWh, is in order and hence allowed.

84. However, energy charge on month to month basis will be billed by the petitioner as per Regulation 21 (5) of the 2009 regulations which is extracted below:

> *"21 (5) The energy charge shall cover the primary fuel cost and limestone consumption cost (where applicable), and shall be payable by every beneficiary for the total energy scheduled to be supplied to such beneficiary during the calendar month on ex-power plant basis, at the energy charge rate of the month (with fuel and limestone price adjustment). Total Energy charge payable to the generating company for a month shall be:*
>
> ***(Energy charge rate in Rs /kWh) x {Scheduled energy (ex-bus) for the month in kWh.}"***

85. The petitioner shall be entitled to compute and recover the annual fixed charges and energy charges in accordance with Regulation 21 of the 2009 regulations.

Application fee and the publication expenses

86. The petitioner has sought approval for the reimbursement of fee of ₹1314780/- each for the years 2009-10, 2010-11 and 2011-12 paid by it for filing the petition and for the expenses incurred for publication of notices in connection with the petition. The petitioner by its affidavit dated 22.3.2010 has submitted that it has incurred an amount of ₹422557/- towards publication of notice in the newspapers.

87. Regulation 42 of the 2009 regulations provides as under:

> *"The application filing fee and the expenses incurred on publication of notices in the application for approval of tariff, may in the discretion of the Commission, be allowed to be recovered by the generating company or the transmission licensee, as the case may be, directly from the beneficiaries or the transmission customers, as the case may be."*

88. The Commission in its order dated 11.1.2010 in Petition No.109/2009 (pertaining to approval of tariff for SUGEN power plant for the period from DOCO to 31.3.2014)

had decided that filing fees in respect of main petitions for determination of tariff and the expenses on publication of notices are to be reimbursed.

88. Accordingly, the expenses incurred by the petitioner on application filing fees for the years 2009-10, 2010-11 and 2011-12 and expenses towards publication of notices in connection with the present petition shall be directly recovered from the beneficiaries, on pro rata basis on production of documentary proof. The filing fees in respect of the balance years of the tariff period would be recoverable as and when paid by the petitioner in terms of the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2008 and /or its amendments thereof.

89. In addition to the above, the petitioner is entitled to recover other taxes etc levied by statutory authorities in accordance with the 2009 regulations, as applicable.

90. The petitioner is already billing the respondents on provisional basis in accordance with the Commission's order dated 6.7.2011. The provisional billing of tariff shall be adjusted in the light of our order dated 26.8.2011 in Petition No. 175/2011(*suo motu*)

91. This order disposes of Petition No.226/2009.

Sd/-	*Sd/-*	*Sd/-*	*Sd/-*
[M.DEENA DAYALAN]	**[V.S.VERMA]**	**[S.JAYARAMAN]**	**[DR.PRAMOD DEO]**
MEMBER	**MEMBER**	**MEMBER**	**CHAIRPERSON**

Annexure-I

Calculation of weighted average rate of interest

Sl. no.	Name of loan	Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
1	Bond XIII (A Series)	Net opening loan	13270.50	11796.00	10321.50	8847.00	7372.50
		Add: Addition during the period					
		Less: Repayment during the period	1474.50	1474.50	1474.50	1474.50	1474.50
		Net Closing Loan	**11796.00**	**10321.50**	**8847.00**	**7372.50**	**5898.00**
		Average Loan	12533.25	11058.75	9584.25	8109.75	6635.25
		Rate of Interest	9.5800%	9.5800%	9.5800%	9.5800%	9.5800%
		Interest	1200.69	1059.43	918.17	776.91	635.66
2	Bond XIII (B Series)	Net opening loan	25013.70	22234.40	19455.10	16675.80	13896.50
		Add: Addition during the period					
		Less: Repayment during the period	2779.30	2779.30	2779.30	2779.30	2779.30
		Net Closing Loan	**22234.40**	**19455.10**	**16675.80**	**13896.50**	**11117.20**
		Average Loan	23624.05	20844.75	18065.45	15286.15	12506.85
		Rate of Interest	9.5800%	9.5800%	9.5800%	9.5800%	9.5800%
		Interest	2263.18	1996.93	1730.67	1464.41	1198.16
10	**Gross Total**	**Net opening loan**	38284.20	34030.40	29776.60	25522.80	21269.00
		Add: Addition during the period	-	-	-	-	-
		Less: Repayment during the period	4253.80	4253.80	4253.80	4253.80	4253.80
		Net Closing Loan	**34030.40**	**29776.60**	**25522.80**	**21269.00**	**17015.20**
		Average Loan	36157.30	31903.50	27649.70	23395.90	19142.10
		Rate of Interest	9.5800%	9.5800%	9.5800%	9.5800%	9.5800%
		Interest	**3463.87**	**3056.36**	**2648.84**	**2241.33**	**1833.81**