

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 295/2009**

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

**DATE OF HEARING: 12.5.2011**

**DATE OF ORDER: 6.9.2011**

**IN THE MATTER OF**

Fixation of tariff in respect of sale of power from Assam Gas Based Power Project (291 MW) of North Eastern Electric Power Corporation Ltd, Shillong for the period from 1.4.2009 to 31.3.2014.

**AND**

**IN THE MATTER OF**

North Eastern Electric Power Corporation Ltd, Shillong  
Vs

**..... Petitioner**

1. Assam Power Distribution Company Ltd, Guwahati
2. Meghalaya State Electricity Board, Shillong
3. Department of Power, Government of Arunachal Pradesh, Itanagar
4. Electricity Department, Government of Manipur, Imphal
5. Power and Electricity Department, Government of Mizoram, Aizawl
6. Department of Power, Government of Nagaland, Kohima
7. Tripura State Electricity Power Corporation Ltd, Agartala
8. North Eastern Regional Power Committee, Shillong
9. North Eastern Regional Load Despatch Centre, Shillong

**.....Respondents**

**The following were present:**

1. Shri P. K. Borah, NEEPCO
2. Shri Rana Bose, NEEPCO
3. Ms. Debjani Dey, NEEPCO
4. Shri A.C.Sarmoh, NEEPCO
5. Shri H.M.Sharma, ASEB
6. Shri K.Goswami, ASEB
7. Shri R.Kapoor, ASEB
8. Shri A.Kharpan, MeECL
9. Shri T.Passah, MeECL
10. Shri A.Gan Choudhury, TSEPCL
11. Shri A.Das, TSEPCL
12. Ms. M.S.Bezbaruah, Consumer
13. Shri A.K.Dutta, Consumer



## ORDER

The petitioner has filed this petition for fixation of tariff in respect of Assam Gas Based Power Project (291 MW) (hereinafter referred to as “the generating station”) of North Eastern Electric Power Corporation Ltd, for the period from 1.4.2009 to 31.3.2014 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter referred to as “the 2009 regulations”).

2. The tariff for the generating station for the period from 1.4.2004 to 31.3.2009 along with additional capital expenditure during the years 2004-05 and 2005-06 was determined by the Commission vide its order dated 22.8.2008 in Petition No.150/2005. Subsequently, the annual fixed charges were revised by Commission’s order dated 11.5.2010 in Petition No.213/2009 after considering the impact of additional capital expenditure incurred for the period 2006-09. The closing capital cost was Rs 148103.44 lakh as on 31.3.2009. The annual fixed charges approved by the Commission vide order dated 11.5.2010 is as under:

	<i>(Rs in lakh)</i>		
	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Depreciation	7127	7127	7127
Interest on Loan	3212	2606	1921
Return on Equity	10278	10278	10278
Advance Against Depreciation	0	0	0
Interest on Working Capital	806	807	805
O & M Expenses	2980	3099	3221
<b>TOTAL</b>	<b>24404</b>	<b>23917</b>	<b>23353</b>

3. Before examining the issues raised in the present petition for determination of tariff of the generating station, we have taken note of the petition (Petition No. 215/2009) filed by Lower Assam Electricity Distribution Company Ltd (LAEDCL), the *erstwhile* Assam State Electricity Board. The said petition was clubbed along with the instant petition and the parties were heard on 12.5.2011. After hearing



the parties and examining the documents on record, we have by order dated 5.9.2011 rejected the prayer of LAEDCL (*the petitioner therein*) for a *pro rata* reduction of the annual fixed charges based on the actual capability of the generating station for the reasons stated there under. Accordingly, we now proceed to determine the annual fixed charges of the generating station in the instant petition.

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

	<i>(₹ in lakh)</i>				
	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>
Return on Equity	13711.74	13744.04	13951.74	14243.34	14450.62
Interest on Loan	1295.92	692.93	510.68	724.72	835.70
Depreciation	7705.81	7735.80	1455.63	1455.63	1455.63
Interest on Working Capital	1358.71	1373.66	1270.92	1310.88	1348.54
O & M Expenses	6663.90	7045.11	7446.69	7874.46	8325.51
<b>Total</b>	<b>30736.08</b>	<b>30591.54</b>	<b>24635.66</b>	<b>25609.03</b>	<b>26416.00</b>

5. Reply to the petition has been filed by the respondent No.1, Assam Power Distribution Co. Ltd (APDCL) and Ms. Mallika Bezbaruah, the consumer respondent. In the reply filed by APDCL, the issue of under generation as raised in Petition No.215/2009 [(filed by LAEDCL, (*erstwhile* ASEB)] has been reiterated. It has also been submitted that the additional capital expenditure claimed has not been segregated and prayed that items be admitted only after prudence check while determining tariff of the generating station for 2009-14. This issue of under-generation of the generating station has already been considered in Petition No. 215/2009 and disposed of by the Commission by its order dated 5.9.2011. The same is adopted in the instant petition. The claims of the petitioner for additional capitalization for 2009-14 would be considered and allowed on prudence check, in terms of the provisions of the 2009 regulations.

6. The Consumer respondent in its reply has raised the following main issues:

(i) Consideration of the revenue from infirm power prior to the date of commercial operation of the generating station and the capital cost thereof.

(ii) Truing –up of the cost of energy for the period 2004-09.

(iii) O&M cost to be calculated on the actual capacity of MW generation capability instead of the installed capacity of 291 MW.

7. We now examine the above issues as under:

**Consideration of the revenue from infirm power prior to the date of commercial operation of the generating station and the capital cost thereof:**

8. The nine units of the generating station were commissioned on different dates during the period from 1.5.1995 to 1.4.1999. As per the Annual Report of the petitioner corporation for the year 1998-99, the total infirm power generated was of 2311.7911 MU thereby realizing ₹441.61 crore. The date of commercial operation of the generating station is 1.4.1999. The consumer respondent has submitted that the Commission had considered only an amount of ₹1.14 crore as wrongly submitted by the petitioner. As such, the total capital cost as per books of accounts as on 1.3.2003 was ₹1451.63 crore, which was considered vide order dated 14.12.2006 in Petition No. 33/2003 needs to be re-calculated by subtracting the cost of infirm power of 2311.7913 MU from the capital cost. The petitioner has submitted that the net revenue from infirm power adjusted against capital cost was ₹2.87 crore and not as stated by the consumer respondent.

9. The issue of infirm power and the capital cost was raised by the respondent in Review Petition No. 25/2007 in Petition No.33/2003. The review petition was dismissed by the Commission vide its order dated 15.7.2007 after giving elaborate



reasons for the same. Being a settled issue, the respondent cannot be allowed to reopen the same again in this proceeding. Hence, the same is rejected.

**Truing –up the cost of energy for the years 2004-09**

10. It has been submitted that the cost of energy is to be calculated as per Regulation 22(i) of the 2004 Tariff regulations, which provides as under:

Energy charge (Rs) =Rate of Energy charge in Rs./kWh x Scheduled energy (ex-bus) for the month in kWh corresponding to scheduled generation.

11. In the case of the petitioner, the specific fuel consumption for the generating station is 0.225 SCM/kWh, considering the Heat Rate of 2250 Kcal/kWh and GCV 10000 Kcal/SCM of gas. The cost of gas for APM GAS is ₹1920.00/ 1000SCM and Non-APM gas is ₹3200.00/1000 SCM. As such, the specific cost of gas for generation is Rs.  $1.92 \times 0.225 = ₹0.432/\text{kWh}$ . With 1 MMSCMD volume of gas, the generator can generate 4.4444 MU per day. Thereafter, any subsequent generation beyond 4.4444 MU would be only Non-APM gas. Hence, monthly generation on APM gas would be 133.33 MU. From the schedule, it has been observed that the generation is less than 133 MU which is the requirement of only APM gas. Accordingly, the cost of energy charges is to be trued up against the actual generation, before taking up the petition for determination of tariff for the period 2009-14.

12. The Base Energy Charge is determined based on the fuel price and GCV of fuel for the preceding three months from the date of the beginning of the tariff period. Any month to month variation in Fuel price and GCV of fuel, on actual basis is adjusted based on the Fuel Price Adjustment formula given in the order. Any deviation from schedule is payable/receivable as the case may be as



Unscheduled Interchange (UI). Hence, there is no need of truing up of energy charges.

**O&M cost should be calculated on actual capacity of MW generation capability instead of installed capacity of 291 MW.**

13. It has been submitted by the consumer that the cost of O& M admitted for 2004-09 under the 2004 Tariff regulations, was based on the installed capacity (MW). Also, the generator could not generate to the tune of total installed capacity due to various reasons. As such, the generators total availability should be reduced substantially. It has also been submitted that O&M cost for 2009-14 should also be reduced as per the reduced capacity of generation and the Commission should take note of the same. The petitioner has clarified that tariff of the generating station for 2004-09 has been approved by the Commission in terms of the 2004 Tariff regulations and the same was recovered on the basis of actual performance of the generating station, during the respective years. O&M cost forms an integral part of the annual fixed charges which are recoverable on the basis of actual performance and hence there exists no justification for reduction of the total annual fixed charges for the generating station, as prayed for by the consumer respondent.

14. Under the Availability Based Tariff mechanism, the generator declares its capacity based on the availability of fuel and is allowed the full fixed charges if it could achieve the normative Target Availability. The annual fixed charges including O&M are reduced *pro rata* if the availability falls short of the Target Availability. Further, the installed capacity of the generating station is 291 MW and there is no de-rating of the capacity as on date. Hence, the total O&M cost on per MW basis has been allowed on the total installed capacity of the generating

station. The objections of the consumer respondent are thus disposed of in terms of the above.

### **CAPITAL COST**

15. The last proviso of Clause 2 of Regulation 7 of the 2009 Regulations provides as under:

*“Provided also that in case of the existing projects, the capital cost admitted by the Commission prior to 1.4.2009 and the additional capital expenditure 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.”*

16. The Commission vide its order dated 11.5.2010 in Petition No. 213/2009 had approved the closing capital cost of ₹148103.44 lakh as on 31.3.2009, after taking into account the additional capital expenditure for the period 2006-09. Accordingly, in terms of the above proviso, the capital cost of ₹148103.44 lakh has been considered as the opening capital cost as on 1.4.2009.

### **Projected Additional Capital Expenditure for 2009-14**

17. Regulation 9 of the 2009 regulations 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, un-discharged 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;

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

(ii) 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

(iii) 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.

18. The claim of the petitioner for additional capital expenditure during 2009-14 pertains to Renovation & Modernization of Gas Booster Station (GBS) along with a spare gas booster compressor, Modernization & Upgradation of Gas Turbine Control System and other works. The claims along with their justification are summarized in the table given below:

	<b>ACTUAL / PROJECTED ADDITIONAL EXPENDITURE CLAIMED</b>					<b>(₹ in lakh)</b> <b>JUSTIFICATION</b>
	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	
REPLACEMENT OF RADIATORS OF GAS ENGINES OF GBS-PHASE WISE	0.00	500.00	1500.00	0.00	0.00	FOR REPLACING THE EXISTING COOLER ON EXPIRY OF ITS USEFUL LIFE.
MOTOR DRIVEN GAS COMPRESSOR	0.00	0.00	4000.00	0.00	0.00	FOR MAINTAINING REDUNDANCY & EFFICIENCY IN OPERATION.
ADDL. INLET SCRUBBER	0.00	300.00	0.00	0.00	0.00	FOR ENSURING CLEAN AND DRY NATURAL GAS INTO THE GBS



	2009-10	2010-11	2011-12	2012-13	2013-14	
REPLACEMENT OF ENGINE FUEL GAS FILTER SYSTEM	0.00	200.00	0.00	0.00	0.00	FOR REPLACING THE EXISTING SYSTEM ON EXPIRY OF ITS USEFUL LIFE.
REPLACEMENT OF GAS ENGINES OF GBS PHASE WISE	0.00	0.00	0.00	1200.00	2500.00	FOR REPLACING THE EXISTING ENGINES, WHICH ARE BECOMING OLD AND OBSOLETE.
UP GRADATION OF MEGAC MACTUS CONTROL SYSTEM OF NHI MAKE GAS TURBINES -PHASE WISE	0.00	0.00	800.00	0.00	800.00	UPGRADING ESSENTIAL DUE TO OBSOLENCE OF THE EXISTING SYSTEMS AND CONSEQUENTIAL ABSENCE OF SPARES AND SERVICE SUPPORT.
UP GRADATION OF MARK IV CONTROL SYSTEMS OF BHEL MAKE GAS TURBINES	0.00	0.00	0.00	400.00	0.00	UP GRADATION ESSENTIAL DUE TO OBSOLENCE OF THE EXISTING SYSTEMS AND CONSEQUENTIAL ABSENCE OF SPARES AND SERVICE SUPPORT.
ROTORS FOR MHI MAKE GAS TURBINES.	0.00	0.00	0.00	2500.00	0.00	FOR FACILITATING INTEGRITY TEST OF EXISTING ROTORS ON COMPLETION OF 80,000 EOH AS PER RECOMMENDATION OF THE OEM.
CONSTRUCTION OF RECREATIONAL FACILITIES	0.00	75.00	10.00	0.00	0.00	AS A MEASURE OF EMPLOYEES WELFARE FOR PROVIDING RECREATIONAL FACILITIES AND ENCOURAGING SPORTS AND FITNESS ACTIVITIES.
CONSTRUCTION OF ATM BUILDING	3.00	0.00	0.00	0.00	0.00	AS A MEASURE OF EMPLOYEES WELFARE.
EXTENSION OF FIRE STATION BUILDING	13.00	0.00	0.00	0.00	0.00	FOR FIRE AND SAFETY MEASURES OF CORPORATION'S PROPERTIES, VIZ. PLANT AND EQUIPMENTS.
EXTENSION OF SCHOOL BUILDING	32.00	30.00	0.00	0.00	0.00	TO IMPROVE PROJECT EDUCATIONAL FACILITY FOR CHILDREN OF THE CORPORATION'S EMPLOYEES.
<b>Total Additional capital expenditure claimed</b>	<b>48.00</b>	<b>1105.00</b>	<b>6310.00</b>	<b>4100.00</b>	<b>3300.00</b>	<b>14863.00</b>



19. The projected additional capital expenditure claimed by the petitioner for Renovation and Modernization (R&M ) scheme for Gas Booster station and the installation of one more Gas Booster Compressor was examined and the Commission decided that the petitioner was required to establish (i) the adequacy of design of Gas booster station at its generating station, (ii) the necessity of Renovation and Modernization (R&M) of gas booster station and (iii) to technically justify the necessity for installation of one additional booster pump and compressor for continuous full load operation of units at its Maximum Continuous Rating (MCR). Accordingly, in line with this, the petitioner was directed by letter dated 11.3.2011 to get the matter examined by CEA and to furnish the recommendations of CEA to the Commission. The petitioner by its affidavit dated 11.5.2011 has furnished point-wise clarification to the information sought for, as under:

**Adequacy of Design of Gas Booster Station:**

20. The Techno Economic Clearance (TEC) for the Assam Gas Based Power Project was accorded by the Central Electricity Authority (CEA) and therefore it is implied that the Gas Booster Station was also adequately designed for running the project at 100% base load. Also, the calorific value of gas was envisaged to be 9500 Kcal/SCM at the time of preparation of the Detailed Project Report during the year 1986, based on which the units of the three Gas Based Stations with a discharge capacity of 27000M<sup>3</sup> /hr. at 1000 rpm was sufficient to run all the 6 gas turbines at 100% base load at the guaranteed heat rate.

**Necessity of undertaking the R&M of gas booster station**

21. Based on the recommendations of a Committee of the petitioner corporation, the R&M of the Gas Based Station (GBS) was initiated during the year 2009 after



scrutiny of the proposal by the Design & Engineering (D&E) wing of the petitioner corporation on the fact that due to overstressing there was an increasing breakdown of GBS units which have run on an average for more than 90500 hrs. The Committee had proposed the replacement of the existing AT25 GL gas engine with a high power rating engine of AT27 GL. However, the D&E wing opined that the problem of frequent breakdown of GBS units cannot be overcome by replacement of engine with a similar engine of higher rating and accordingly suggested the installation of additional 2(two) nos. of motor driven gas compressor units, in order to reduce the load on the existing compressors and have redundancy.

22. The study report along with the above suggestions were forwarded to CEA for its views by the petitioner. CEA vide its letter dated 3.11.2009 observed that in case the petitioner intended to install additional 2 Nos. of motor driven gas compressor units, then :

- (a) the adequacy of 2 x 100 MVA existing station transformers to cater the additional load individually, in case one of them is not in service, is to be ensured
- (b) the availability of space for extension of 6.6 kV station switch board to house the additional panels for new compressors; and
- (c) availability of space for extending the existing GBS building shall also be examined.

23. It was also indicated that in case the installation of additional 2 nos. of motor driven gas compressor units was not found technically feasible after detailed study, then the petitioner may explore the possibility of providing one no. additional unit complete with compressor and gas engine of higher rating i.e. 12V-AT27 GL to overcome the problem of frequent outage/tripping. After installation of



additional unit, one unit shall be available as standby, one for maintenance and three in working condition.

24. After a detailed study of the observations of CEA as above, the petitioner has found the proposal for installation of additional motor driven gas compressor units to be techno-economically feasible and most suited, in order to overcome the perennial problem of overloading of the existing gas compressor units.

**Necessity of installation of one additional booster pump and compressor**

25. The petitioner has submitted that since the preparation of Detailed Project Report (DPR) and Techno-Economic Clearance (TEC) and the initial period of operation, there has been gradual fall in net calorific value of the fuel gas and the average calorific value was about 8277.34 Kcal/SCM during the period from 2002-03 to 2009-10. As per the gas supply agreement with M/s Oil India Ltd (OIL), the range of calorific value shall be from 8000-8500Kcal/SCM, beyond which there will be price adjustment. Due to the deterioration in the quality of gas, the gas turbines required more volume of gas to maintain the same generation, which need to be delivered by the Gas Compressor units. Further, the gas booster units were run at 900 rpm due to operational constraints and as a result, all the four Gas Compressor units were required to be put into service without having redundancy for maintaining 100% base load, thereby overstressing the Gas Booster Station. To justify its claim, the petitioner has furnished the following back up calculations:



Guaranteed Heat Rates		Calorific Value		Specific Gas Consumption		Total Gas Required for one hour				Number of GCs required at 900 rpm and 15% loss due to ageing, wear etc.	
	A		B		C=A/B		D		E=CxD		F=E/(24300x0.85)
Based Load	3083	Kca/kWh	8000	Kcl/M <sup>3</sup>	0.385375	M <sup>3</sup> KWh	201	MW	77460.38	SCUM	3.75
80% Load	3300				0.4125		161		66412.5		3.22
GT Based Load	3083	Kca/kWh	8280	Kcl/M <sup>3</sup>	0.372343	M <sup>3</sup> KWh	201	MW	74840.94	SCUM	3.62
80% GT Load	3300				0.398551		161		64166.67		3.11

26. Based on the justification submitted by the petitioner and the documents on record, the claim for additional capital expenditure towards R&M of Gas Booster Station, one additional gas booster compressor and other assets is discussed in the subsequent paragraphs:

**Requirement of one additional compressor for 2011-12**

27. The generating station receives gas at a pressure of about 4.5 to 5.5 kg/cm<sup>2</sup> and is fed to a Gas Booster Station (GBS) in order to increase the pressure to the required pressure of 21/ kg/cm<sup>2</sup> before feeding to Gas Turbines. The (GBS) has four (4) number of compressors which are driven by four (4) number of gas engines. It is observed from the details of Gas Booster Compressors that the compressors were designed at a flow rate of 27000 m<sup>3</sup>/hr at a rotating speed of 1000 rpm and with Horse Power (H.P) of 2442. At present, the compressors are running at 900 rpm. The variation in RPM is due to variation in quality of gas which contains high quantity of water. As a result, the discharge from compressor decreases to 24300 m<sup>3</sup>/hr as against 27000 m<sup>3</sup>/hr. The discharge capacity of the compressor is affected by the gas composition which affects compressibility and in turn affects the mass flow.



28. The contracted capacity of the gas is 1.4 MMSCMD which can generate from 200 MW to 210 MW depending on the quality of gas. It is observed from the back up calculations furnished by the petitioner in support of its claim for one more additional compressor, that there was only a requirement of three nos. of compressor at 80% GT load and at a conservative value of calorific value of gas as 8280 Kcal/SCM. Considering the fact that GT can be loaded only up to 70-72% with the present availability of contracted gas and calorific value as claimed by the petitioner, it is clear that three (3) gas booster compressors are adequate with one compressor to remain as standby. The petitioner was receiving gas at more than 1.7 MMSCMD on some occasions due to receipt of some quantum of gas on fall back basis from the gas company when there was less drawl by fertilizer units the tea season was over. Accordingly, the Plant Load Factor (PLF) achieved on these occasions were more than 90% and this requires all the four gas compressors to run in order to utilize the available gas of 1.7 MMSCMD leaving no redundancy. As such, any break down of one compressor would result in generation loss whenever the generating station receives gas in excess of the contracted capacity of 1.4 MMSCMD.

29. However, the availability of additional gas on fall back basis is a temporary phenomena and not a firm supply of gas by the OIL. Under these circumstances, we are of the view that it would be unfair to allow the cost of an asset which would remain unutilized at the present level of contracted gas supply of 1.4 MMSCMD, and load the same on the beneficiaries, until the petitioner arrange for a firm supply of additional gas for the generating station. In view of this, the additional capital expenditure of Rs. 4000 lakh claimed for 2011-12 for one additional motor



driven gas compressor unit for meeting redundancy and efficiency in operation is not justifiable at this stage and the same is disallowed.

30. The additional capital expenditure claimed by the petitioner for other assets for 2009-14 and the findings of the Commission on these after prudence check, is as under:

Year	Assets	Amount (Rs in lakh)	Findings
2009-10	Extension of fire station building for safety of plant and equipment	13.00	<b>Not allowed</b> since no proper justification as to the necessity for extension of fire station building after 15 years (approx) of operation of the plant has been submitted.
	Construction of ATM building	3.00	<b>Not allowed</b> as the expenses do not relate to the core activity of the generating station.
	Extension of school building	32.00	
2010-11	Additional inlet scrubber to ensure clean & dry natural gas into the Gas Booster compressors.	300.00	The generating station has reciprocating compressors in the gas booster station which need high dry gas for better compressor, throughout. Considering the quality of gas received by the generating station, installation of an additional scrubber at the gas inlet, is justifiable. In view of this, the capitalization of the expenditure is <b>allowed</b> for smooth operation of the generating station.
	Replacement of radiators of gas engines-Phase wise	500.00	<b>Allowed</b> since the asset has outlived its life. Moreover, the capitalization of these assets is justifiable in respect of a Gas Booster station which has completed more than 15 years of useful life.
	Engine fuel gas filter system of Gas Booster station	200.00	
	Construction of recreational facilities	75.00	<b>Not allowed</b> as the expenses do not relate to the core activity of the generating station.
	Extension of school building	30.00	<b>Not allowed</b> as the expenses do not relate to the core activity of the generating station

Year	Assets	Amount (Rs in lakh)	Findings
2011-12	Replacement of radiators of gas engines	1500.00	<b>Allowed</b> since the asset has outlived its life. Moreover, the capitalization of these assets is justifiable in respect of a Gas Booster station which has completed more than 15 years of useful life
	Up-gradation of MEGAC MACTUS control system of MHI make GT	800.00	These control systems of Gas Turbines have become obsolete and the support of spares and service is also not available. Moreover, with the evolvement of new technology in the control system, the gas turbine control system has undergone significant changes in the last decade. In view of this, the capitalization of the expenditure <b>is allowed</b> for smooth operation of the generating station.
	Construction of recreational facilities	10.00	<b>Not allowed</b> as the expenses do not relate to the core activity of the generating station
2012-13	Replacement of gas engines of gas booster station –Phase wise	1200.00	<b>Allowed</b> as the existing gas engines have become old and obsolete. Hence R&M of gas engines is allowed.
	Conducting integrity test of MHI make GT Rotor after completion of 80,000 EOH as per recommendation of Original Equipment Manufacturer at their works.	2500.00	The integrity test of each rotor is expected to take about 6 months time including time taken for transportation of the same. The rotor integrity test i.e. rotor dynamic integrity which mainly involves testing of rotor vibration to see the rotor balancing, condition of journal bearings, jacking oil flow system etc. could be done with the help of the Original Equipment Manufacturer (OEM) on the site during major inspection and the cost of such inspection should be booked to O& M cost. In view of this, the capitalization of expenditure on spare rotor is <b>not allowed</b> .
	Up gradation of Mark-IV control system of BHEL make GT	400.00	These control systems of Gas Turbines have become obsolete and the support of spares and service is also not available. Moreover, with the evolvement of new technology in the control system, the gas turbine control system has undergone significant changes in the last



			decade. In view of this, the capitalization of the expenditure is <b>allowed</b> for smooth operation of the generating station.
<b>2013-14</b>	Replacement of gas booster engines of gas booster station –Phase wise	2500.00	<b>Allowed</b> as the existing gas engines have become old and obsolete. Hence R&M of gas engines is allowed.
	Up-gradation of MEGAC MACTUS control system of MHI make GT	800.00	These control systems of Gas Turbines have become obsolete and the support of spares and service is also not available. Moreover, with the evolvement of new technology in the control system, the gas turbine control system has undergone significant changes in the last decade. In view of this, the capitalization of the expenditure <b>is allowed</b> for smooth operation of the generating station.

31. Based on the above discussions, the additional capital expenditure for 2009-14 allowed is summarized as under:

Head of works/ equipments	Actual / Projected additional expenditure				
	2009-10	2010-11	2011-12	2012-13	2013-14
Replacement of radiators of gas engines of GBS- Phase wise	0.00	500.00	1500.00	0.00	0.00
Addl. Inlet scrubber	0.00	300.00	0.00	0.00	0.00
Replacement of engine fuel gas filter system	0.00	200.00	0.00	0.00	0.00
Replacement of gas engines of GBS Phase wise	0.00	0.00	0.00	1200.00	2500.00
Up gradation of MEGAC MACTUS control system of NHI make gas turbines -Phase wise	0.00	0.00	800.00	0.00	800.00
Up gradation of Mark IV control systems of BHEL make gas turbines	0.00	0.00	0.00	400.00	0.00
Total additional capital expenditure allowed prior to de-capitalization	<b>0.00</b>	<b>1000.00</b>	<b>2300.00</b>	<b>1600.00</b>	<b>3300.00</b>

#### **De-capitalization amount for replacement of existing assets**

32. The petitioner by its affidavit dated 18.2.2011 has submitted that the turn-key contractors of the generating station had supplied components against a lump sum contract price without any component wise price break-up and that no

component-wise details /records were available in the asset register of the generating station. As a result of this, the actual value of old replaced assets could not be furnished and that the value of old assets has been calculated from the present estimated prices by applying the RBI indices.

33. It is noticed that the de-capitalized value of old assets has been considered as 50% of the value of the new assets. This is found to be in order and the said value has been considered.

34. Accordingly, the value of the old assets proposed to be de-capitalized corresponding to the replaced new assets is as under:

*(Rs in lakh)*

Head of works/ equipments	Actual / Projected additional expenditure				
	2009-10	2010-11	2011-12	2012-13	2013-14
Replacement of radiators of gas engines of GBS- Phase wise	0.00	250.00	750.00	0.00	0.00
Replacement of engine fuel gas filter system	0.00	100.00	0.00	0.00	0.00
Replacement of gas engines of GBS Phase wise	0.00	0.00	0.00	600.00	1250.00
Up gradation of MEGAC MACTUS control system of NHI make gas turbines -Phase wise	0.00	0.00	400.00	0.00	400.00
Up gradation of Mark IV control systems of BHEL make gas turbines	0.00	0.00	0.00	200.00	0.00
<b>Total de-capitalization allowed</b>	<b>0.00</b>	<b>350.00</b>	<b>1150.00</b>	<b>800.00</b>	<b>1650.00</b>

35. Accordingly, the following additional capital expenditure is allowed after taking into account the corresponding de-capitalization wherever the existing asset has been replaced with a new asset during the period 2009-14.

*(₹ in lakh)*

Head of works/ equipments	Actual / Projected additional expenditure				
	2009-10	2010-11	2011-12	2012-13	2013-14
Replacement of radiators of gas engines of GBS- Phase wise	0.00	250.00	750.00	0.00	0.00
Addl. Inlet scrubber	0.00	300.00	0.00	0.00	0.00
Replacement of engine fuel gas filter system	0.00	100.00	0.00	0.00	0.00



Replacement of gas engines of GBS Phase wise	0.00	0.00	0.00	600.00	1250.00
Up gradation of MEGAC MACTUS control system of NHI make gas turbines -Phase wise	0.00	0.00	400.00	0.00	400.00
Up gradation of Mark IV control systems of BHEL make gas turbines	0.00	0.00	0.00	200.00	0.00
<b>Total additional capital expenditure allowed after de-capitalization</b>	<b>0.00</b>	<b>650.00</b>	<b>1150.00</b>	<b>800.00</b>	<b>1650.00</b>

### Capital Cost for 2009-14

36. In view of the above discussions, the Capital cost allowed for 2009-14 is as under:

	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Opening Capital cost as on 1 <sup>st</sup> April of the financial year	148103.44	148103.44	148753.44	149903.44	150703.44
Additional Capital expenditure allowed	0.00	650.00	1150.00	800.00	1650.00
Capital Cost as on 31 <sup>st</sup> March of the financial year	<b>148103.44</b>	<b>148753.44</b>	<b>149903.44</b>	<b>150703.44</b>	<b>152353.44</b>

### Debt-Equity Ratio

37. 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 utilised 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 modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this regulation”*

38. The petitioner has submitted that the additional capital expenditure has been financed through internal resources and others. In terms of the above said regulation, the debt-equity ratio of 70:30 has been considered on the additional capital expenditure after adjustment of un-discharged liability, for the purpose of tariff.

39. The debt equity ratio considered in order dated 11.5.2010 in Petition No. 213/2009 was 50.43:49.47. However in line with the above provisions of the regulations, the debt equity ratio of 70:30 has been considered on the admitted additional capital expenditure during 2009-14.

### **Return on Equity**

40. Regulation 15 of the 2009 regulations provides that:

*“(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 normal tax rate for the year 2008-09 applicable to the concerned generating company or the transmission licensee, as the case may be.*

*Provided that return on equity with respect to the actual 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 tried up separately for each year of the tariff period along with the tariff petition filed for the next tariff period.*



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

$$\text{Rate of pre-tax return on equity} = \text{Base rate} / (1-t)$$

41. The petitioner has considered Rate of Return on Equity @ 18.674%, based on prevailing MAT rate (Basic rate of 15%+10% surcharge+3% education Cess = 16.995%) for 2009-10.

42. In terms of the provisions of the above regulations, Return on equity has been worked out @17.481% per annum on the normative equity, after accounting for the additional capital expenditure, considering the base rate of 15.5% and MAT rate of 11.33%. Return on equity has been worked out as under:

*(₹ in lakh)*

	2009-10	2010-11	2011-12	2012-13	2013-14
Gross Notional Equity	73419.71	73419.71	73614.71	73959.71	74199.71
Addition due to Additional capitalization	-	195.00	345.00	240.00	495.00
Closing Equity	73419.71	73614.71	73959.71	74199.71	74694.71
Average Equity	73419.71	73517.21	73787.21	74079.71	74447.21
Return on Equity (Base Rate )	15.500%	15.500%	15.500%	15.500%	15.500%
Min Alt. Tax rate for the year 2008-09	11.330%	11.330%	11.330%	11.330%	11.330%
Rate of Return on Equity	17.481%	17.481%	17.481%	17.481%	17.481%
<b>Return on Equity</b>	<b>12834.17</b>	<b>12851.21</b>	<b>12898.41</b>	<b>12949.54</b>	<b>13013.78</b>

43. Any change in the rate of return on equity due to changes in the tax rate would however be considered at the time of truing up.

### **Interest on loan**

44. 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.*

45. The interest on loan has been computed as under:

(a) The opening gross normative loan as on 1.4.2009 of each unit of the generating station has been arrived at in accordance with the provisions of the above regulations.

(b) The repayment of loan for the respective years of the period 2009-14 has been considered equal to the depreciation allowed for that year.

(c) The petitioner has submitted the statement showing the actual interest rate on the Syndicate loan carrying a floating rate of interest for the period 2008-09 to arrive at the rate of interest at 8.813% as on 1.4.2009. However, as regards syndicate loan, the rate of interest of 7.94% has been considered as on 1.4.2009 (i.e the carried over rate of interest existing as on 31.3.2009) for the years 2009-10 and 2010-11.

(d) Since the actual loan is repaid in the year 2012-13, the weighted average rate of interest on loan for the year 2010-11 has been considered in the year 2013-14.

46. The calculation for weighted average rate of interest on loans is annexed to this order. Based on the above, the interest on loan for the purpose of tariff is worked out as under:

(Rs in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Gross Normative loan	74683.73	74683.73	75138.73	75943.73	76503.73
Cumulative Repayment upto Previous Year	56309.37	64013.93	71735.40	73220.25	74779.69
Net Loan-Opening	18374.36	10669.80	3403.33	2723.48	1724.04
Additions due to Additional Capitalisation	-	455.00	805.00	560.00	1155.00
Repayment during the year	7704.56	7721.47	1484.85	1559.44	1661.19
Net Loan-closing	10669.80	3403.33	2723.48	1724.04	1217.85
Average Loan	14522.08	7036.56	3063.40	2223.76	1470.94
Weighted Average Rate of Interest on loan	8.558%	9.429%	9.783%	9.783%	9.783%
<b>Interest on Loan</b>	<b>1242.76</b>	<b>663.48</b>	<b>299.69</b>	<b>217.55</b>	<b>143.90</b>

### Depreciation

47. Regulation 17 of the 2009 regulations provides that:

*“(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 long-term 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 3[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”.*



48. The date of commercial operation of the generating station is 1.3.1999. Since the generating station has completed 12 years of operation as on 1.3.2011, the weighted average rate of depreciation of 5.202%, calculated as above, has been considered for the calculation of depreciation during the year 2009-10 and 2010-11. The remaining depreciable value has been spread over the balance useful life of the assets from the year 2011-12 onwards to 2013-14. Assets amounting to ₹350.00 lakh, ₹1150.00 lakh, ₹800.00 lakh, and ₹1650.00 lakh have been de-capitalized during 2010-11, 2011-12, 2012-13 and 2013-14 respectively. The amount of cumulative depreciation allowed in tariff against these de-capitalized assets has been calculated on *pro rata* basis and the same has been adjusted from the cumulative depreciation of the year of de-capitalization. Accordingly, depreciation has been worked out as under:

	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Gross block as on 31.3.2009	148103.44	148103.44	148753.44	149903.44	150703.44
Additional capital expenditure during 2009-14	0.00	650.00	1150.00	800.00	1650.00
Closing gross block	148103.44	148753.44	149903.44	150703.44	152353.44
Average gross block	148103.44	148428.44	149328.44	150303.44	151528.44
Rate of Depreciation	5.202%	5.202%	5.202%	5.202%	5.202%
Depreciable value including amortization of land in 25 years @ 90%	133293.10	133585.60	134395.60	135273.10	136375.60
Balance useful life of the asset	14.9	13.9	12.9	11.9	10.9
Remaining Depreciable value	33484.72	26072.66	19179.36	18583.40	18134.74
<b>Depreciation</b>	<b>7704.56</b>	<b>7721.47</b>	<b>1484.85</b>	<b>1559.44</b>	<b>1661.19</b>

### Operation & Maintenance Expenses

49. The petitioner has claimed following O&M expenses for 2009-14:



	<i>(₹ in lakh)</i>				
	2009-10	2010-11	2011-12	2012-13	2013-14
<b>O&amp;M expenses</b>	<b>6663.90</b>	<b>7045.11</b>	<b>7446.69</b>	<b>7874.46</b>	<b>8325.51</b>

50. The above O&M expenses claimed by the petitioner are in terms of Regulation 19 (c) of the 2009 regulations which specify the normative O&M expenses for Small Gas Turbine Stations for 2009-14. The O&M claimed is in order and hence allowed.

### **Operational Norms**

51. The following operational norms have been considered for the computation of Energy Charge Rate (ECR) and the Fuel component in working capital as per the 2009 regulations.

<b>Description</b>	<b>Units</b>	<b>Norm</b>
NAPAF for recovery of full fixed charges	%	72.00
Gross Station Heat	kCal / kWh	2400.00
Auxiliary Energy Consumption	%	3.00

### **Interest on Working Capital**

52. In accordance with sub-clause (b) of clause (1) of Regulation 18 of the 2009 regulations, working capital in case of open cycle gas turbine shall cover:

(i) *Fuel cost for one month corresponding to the normative annual plant availability factor, duly taking into account the mode of operation of the generating station on gas and liquid fuel;*

(ii) *xxxxxxx*

(iii) *Maintenance spares at 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;*

(v) *Operation and maintenance expenses for one month.*

53. The petitioner has claimed the fuel cost in the working capital as under:



(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Cost of fuel for 1 month	1138.12	1138.12	1138.12	1138.12	1138.12
Energy charges for two months as receivables	2276	2276	2276	2276	2276

54. In the above claim, the petitioner has considered the requirement of fuel (gas) on monthly basis, based on the targeted energy generation per month considering 30 days in a month. However, in terms of the above provision of the regulations, the requirement of gas has been computed on annual basis, by considering normative annual plant availability factor for 365 days. This annual gas requirement is then divided by 12 months in order to arrive at the gas requirement per month.

55. Based on the above, the fuel cost in the working capital is worked out as under:

(₹ in lakh)

	2009-10	2010-11	2011-12 (leap year)	2012-13	2013-14
Cost of Fuel for 1 month	1152.69	1152.69	1155.85	1152.69	1152.69
Energy Charges for two months as receivables	2305.38	2305.38	2311.70	2305.38	2305.38

### **Maintenance Spares**

56. In terms of the provisions of the above regulations, maintenance spares claimed by the petitioner is allowed as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Maintenance Spares	1999.17	2113.53	2234.01	2362.34	2497.65

### **Receivables**

57. In terms of the provisions of the above regulations, receivables equivalent to two months of capacity charge and energy charge calculated on normative plant availability factor is as allowed as under:



	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Receivables	7270.41	7245.53	6208.61	6285.71	6381.77

### O&M Expenses

58. In terms of the provisions of the above regulations Operation and maintenance expenses for one month claimed by the petitioner is allowed as under:

	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
O & M expenses	555.33	587.09	620.56	656.21	693.79

59. In terms of Clauses (3) and (4) of Regulation 18 of the 2009 regulations, the SBI PLR as on 1.4.2009 was 12.25%. This has been considered by the petitioner. The same interest rate has been considered in the calculations, for the purpose of tariff.

60. Necessary computations in support of calculation of interest on working capital are as under:

	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Fuel Cost	1152.69	1152.69	1155.85	1152.69	1152.69
Maintenance Spares	1999.17	2113.53	2234.01	2362.34	2497.65
O & M expenses	555.33	587.09	620.56	656.21	693.79
Receivables	7270.41	7245.53	6208.61	6285.71	6381.77
Total	10977.60	11098.84	10219.03	10456.95	10725.90
Rate of Interest	12.25%	12.25%	12.25%	12.25%	12.25%
<b>Interest on Working Capital</b>	<b>1344.76</b>	<b>1359.61</b>	<b>1251.83</b>	<b>1280.98</b>	<b>1313.92</b>

### Annual Fixed Charges

61. The annual fixed charges approved for the generating station for the period from 1.4.2009 to 31.3.2014 is as under:

	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Return on Equity	12834.17	12851.21	12898.41	12949.54	13013.78
Interest on Loan	1242.76	663.48	299.69	217.55	143.90
Depreciation	7704.56	7721.47	1484.85	1559.44	1661.19
Interest on Working Capital	1344.76	1359.61	1251.83	1280.98	1313.92
O & M Expenses	6663.90	7045.11	7446.69	7874.46	8325.51
<b>Total</b>	<b>29790.15</b>	<b>29640.88</b>	<b>23381.47</b>	<b>23881.97</b>	<b>24458.31</b>



62. The recovery of the annual fixed charges shall be subject to truing up, in terms of Regulation 6 of the 2009 regulations.

**Energy Charge Rate (ECR)**

63. In terms of the 2009 regulations, the base rate of Energy charge has been computed based on the weighted average price and GCV of gas for the preceding three months of Jan, Feb and March, 2009 as computed by us based on the information furnished by the petitioner as given below:

Description	As furnished by the petitioner vide affidavit dated 8.9.2010	As allowed by Commission
Gas price (Rs./1000 SCM)	2898.70	2898.70
Gas GCV (kcal/SCM)	9221.15	9231.00

64. The base energy charge works out is as under:

Gross Station Heat Rate	kCal/kWh	2400.00
Aux. Energy Consumption	%	3.00
Weighted Average GCV of gas	kCal/Kg	9231.00
Weighted Average Price of gas	Rs./1000 SCM	2898.70
Rate of Energy Charge ex-bus per kWh Sent	Paise/kWh	77.70

65. The total Energy Charge payable to the generating station during the calendar month shall be:

**(Energy Charge rate in Rs/kWh) x { Scheduled energy (ex-bus) for the month in kWh}**

66. In terms of Regulation 21 (6) (b) of the 2009 regulations, the Energy Charge rate (ECR) in Rs./kWh on ex-power plant on month to month basis for gas based stations shall be calculated up to three decimal places in accordance with the formulae given as under:

$$ECR = GHR \times LPPF \times 100 / \{CVPF \times (100 - AUX) \}$$

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.

CVSF = Calorific value of secondary fuel, in kCal per ml.

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

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

LC = Normative limestone consumption in kg per kWh.

LPL = Weighted average landed price of limestone in Rupees per kg.

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

### **Application fee and the publication expenses**

67. The petitioner has sought approval for the reimbursement of fee paid by it for filing the petition for determination of tariff for the generating station. However, the details of the actual expenditure incurred for publication of notice in the newspapers, has not been submitted by the petitioner.

68. 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.”*

69. In terms of the order of the Commission dated 11.1.2010 in Petition No.109/2009 the filing fees in respect of main petitions for determination of tariff and the expenses on publication of notices are to be reimbursed.

70. Accordingly, the expenses incurred by the petitioner on application filing fees amounting to 5,82,000 lakh each for the years 2009-10, 2010-11 and 2011-12 respectively, in connection with the present petition shall be directly recovered from the beneficiaries, on *pro rata* basis. The reimbursement of charges towards the publication of notices in newspapers shall also be recovered on *pro rata* basis, on submission of documentary proof of the same.



71. The difference between the annual fixed charges provisionally recovered by the petitioner and the annual fixed charges determined by this order shall be liquidated by the respondents in terms of our dated 26.8.2011 in Petition No. 175/2011(*suo motu*).

72. Petition No.295/2009 stands disposed of in terms of the above.

**Sd/-**  
**[M.DEENA DAYALAN]**  
**MEMBER**

**Sd/-**  
**[V.S.VERMA]**  
**MEMBER**

**Sd/-**  
**[S. JAYARAMAN]**  
**MEMBER**

**Sd/-**  
**[DR.PRAMOD DEO]**  
**CHAIRPERSON**



**Annexure**

**Calculation of weighted average rate of interest on actual loans**

(₹ in lakh)						
<b>Sl.</b>	<b>Particulars</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>
<b>1</b>	<b>MOP Loan</b>					
	Gross loan - Opening	61608.43	61608.43	61608.43	61608.43	61608.43
	Cumulative repayments of Loans upto previous year	61608.43	61608.43	61608.43	61608.43	61608.43
	Net loan - Opening	0.00	0.00	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	0.00	0.00	0.00	0.00	0.00
	Rate of Interest on Loan					
	Interest on loan	0.00	0.00	0.00	0.00	0.00
<b>2</b>	<b>Bonds</b>					
	Gross loan - Opening	12230.00	12230.00	12230.00	12230.00	12230.00
	Cumulative repayments of Loans upto previous year	12230.00	12230.00	12230.00	12230.00	12230.00
	Net loan - Opening	0.00	0.00	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	0.00	0.00	0.00	0.00	0.00
	Rate of Interest on Loan					
	Interest on loan	0.00	0.00	0.00	0.00	0.00
<b>3</b>	<b>PSU 8th Series Bonds redeemable on 07.01.2010</b>					
	Gross loan - Opening	7938.01	7938.01	7938.01	7938.01	7938.01
	Cumulative repayments of Loans upto previous year	0.00	7938.01	7938.01	7938.01	7938.01
	Net loan - Opening	7938.01	0.00	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	7938.01	0.00	0.00	0.00	0.00
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	3969.01	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	7.933%				
	Interest on loan	314.86	0.00	0.00	0.00	0.00
<b>4</b>	<b>PSU 9th Series Bonds redeemable on 31.3.2013</b>					
	Gross loan - Opening	5225.05	5225.05	5225.05	5225.05	5225.05
	Cumulative repayments of Loans upto previous year	0.00	0.00	0.00	0.00	5225.05
	Net loan - Opening	5225.05	5225.05	5225.05	5225.05	0.00



	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	0.00	0.00	0.00	5225.05	0.00
	Net loan - Closing	5225.05	5225.05	5225.05	0.00	0.00
	Average Net Loan	5225.05	5225.05	5225.05	2612.52	0.00
	Rate of Interest on Loan	9.783%	9.783%	9.783%	9.783%	
	Interest on loan	511.17	511.17	511.17	255.58	0.00
<b>5</b>	<b>Term Loan (United Bank of India)</b>					
	Gross loan - Opening	3088.16	3088.16	3088.16	3088.16	3088.16
	Cumulative repayments of Loans upto previous year	3088.16	3088.16	3088.16	3088.16	3088.16
	Net loan - Opening	0.00	0.00	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	0.00	0.00	0.00	0.00	0.00
	Rate of Interest on Loan					
	Interest on loan	0.00	0.00	0.00	0.00	0.00
<b>6</b>	<b>HUDCO Loan</b>					
	Gross loan - Opening	25144.19	25144.19	25144.19	25144.19	25144.19
	Cumulative repayments of Loans upto previous year	25144.19	25144.19	25144.19	25144.19	25144.19
	Net loan - Opening	0.00	0.00	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	0.00	0.00	0.00	0.00	0.00
	Rate of Interest on Loan					
	Interest on loan	0.00	0.00	0.00	0.00	0.00
<b>7</b>	<b>Syndicated Loan</b>					
	Gross loan - Opening	39097.28	39097.28	39097.28	39097.28	39097.28
	Cumulative repayments of Loans upto previous year	28882.20	36612.85	39097.28	39097.28	39097.28
	Net loan - Opening	10215.08	2484.43	0.00	0.00	0.00
	Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
	Less: Repayment (s) of Loans during the year	7730.65	2484.43	0.00	0.00	0.00
	Net loan - Closing	2484.43	0.00	0.00	0.00	0.00
	Average Net Loan	6349.75	1242.21	0.00	0.00	0.00
	Rate of Interest on Loan	7.940%	7.940%	7.940%	7.940%	
	Interest on loan	504.17	98.63	0.00	0.00	0.00
<b>8</b>	<b>Total Loan</b>					
	Gross loan - Opening	154331.12	154331.12	154331.12	154331.12	154331.12
	Cumulative repayments of Loans upto previous year	130952.98	146621.64	149106.07	149106.07	154331.12
	Net loan - Opening	23378.14	7709.48	5225.05	5225.05	0.00





Add: Drawal(s) during the Year	0.00	0.00	0.00	0.00	0.00
Less: Repayment (s) of Loans during the year	15668.66	2484.43	0.00	5225.05	0.00
Net loan - Closing	7709.48	5225.05	5225.05	0.00	0.00
Average Net Loan	15543.81	6467.26	5225.05	2612.52	0.00
Interest on loan	1330.20	609.80	511.17	255.58	0.00
Weighted average Rate of Interest on Loans	<b>8.558%</b>	<b>9.429%</b>	<b>9.783%</b>	<b>9.783%</b>	-

