

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

1. Dr. Pramod Deo, Chairperson
2. Shri R.Krishnamoorthy, Member
3. Shri S.Jayaraman, Member
4. Shri V.S.Verma, Member

Petition No.96/2007

IN THE MATTER OF

Approval of tariff of Ratnagiri Gas and Power Project for the period from 1.9.2007 to 31.3.2009.

AND IN THE MATTER OF

1. Ratnagiri Gas and Power Private Ltd
 2. Maharashtra State Electricity Distribution Company Ltd
-Petitioners

The following were present:

1. Shri A.K.Ahuja, MD, RGPPL
2. Shri J.S.Chordia, RGGPL
3. Shri B.M.Gulati, RGGPL
4. Shri Parveen Saxena, RGPPL
5. Shri Farrukh Amir, Consultant, RGPPL
6. Shri Prahlad Ramrakhiani, RGPPL
7. Shri R.K.Gupta, ED, MSEDCL

**ORDER
(DATE OF HEARING: 16.4.2009)**

This petition has been filed jointly, by the Ratnagiri Gas and Power Private Ltd (RGPPL) and the Maharashtra State Electricity Distribution Company Ltd (MSEDCL), (hereinafter referred to as "the petitioners") under Sections 62, and 79

(1) (a) of the Electricity Act, 2003 (hereinafter referred to as “the Act”) for approval of generation tariff for 2150 MW Ratnagiri Gas and Power Project (hereinafter referred to as “the generating station”) for the period from 1.9.2007 to 31.3.2009.

2. Petitioner No.1, a joint venture of NTPC Ltd, GAIL, MSEB Holding Company and ICICI, IDBI, SBI and Canara Bank, had taken over the generating station from Dabhol Power Company. In support of the claim that the generating station will be supplying power in more than one State, the petitioner No.1 has produced a certificate dated 14.3.2006 from Ministry of Power to the effect that the generating station is an inter-State thermal power plant. The generating station has been designed to operate on LNG as the main fuel for generation of electricity and one of the promoters viz GAIL, has been entrusted with the responsibility of sourcing LNG on long-term basis. Till such time the generating station becomes operational on LNG, R-LNG by pipeline has been considered.

3. The generating station consists of three power blocks with original installed capacity, as under:

Block-I	670 MW (GT 2x215 +ST 1x240)
Block-II	740 MW (GT 2x240 +ST 1x260)
Block-III	740 MW (GT 2x240 +ST 1x260)
Total capacity	2150 MW

4. Block-I of the generating station has not been commissioned, whereas the dates of commercial operation of Block-II and Block-III have been declared as 1.9.2007 and 21.11.2007 respectively.

5. The Commission by its order dated 25.10.2006 in Petition No. 67/2006 had approved the tariff for infirm power from October 2006 to March 2007, as under:

“6. At the hearing the representative of the petitioner produced a copy of the letter dated 9.10.2006 from the respondent addressed to the petitioner according to which the parties had agreed for parameters of heat rate of 2000 Kcal/kWh and auxiliary power consumption @ 3.5% for arriving at fuel charges on landed cost basis as pass through during the period of sale of infirm power. In terms of said letter dated 9.10.2006, the respondent has also agreed to pay incidental cost @ 30 paise/kWh for infirm power proposed to be supplied by the petitioner. The correctness of the letter dated 9.10.2006 was confirmed by learned counsel for the respondent. The respondent is also liable to pay fuel charge @ Rs.4.71/kWh corresponding to present day naphtha price of US\$492 per ton. It was stated that fuel charges of Rs.4.71/kWh was subject to variation depending upon the naphtha price. It was further stated that power supply was likely to be started by mid-November 2006. The petitioner has since submitted a copy of the Power Purchase Agreement 19.10.2006, according to which fuel charges will be worked out in accordance with the following formula:

$$\text{Fuel Charges} = \frac{\text{Gross Heat Rate (Kcal/kWh)} \times \text{Price of Fuel (Rs./Kg)}}{\text{Gross GCV of Naphtha (Kcal/Kg)} [1-\text{APC} (\%)]}$$

7. In view of the understanding arrived at by the parties, we approve the price of Rs.5.01/kWh, which includes fuel charges of Rs.4.71/kWh and incidental expenses of 30 paise/kWh, fuel charges being subject to variation depending upon the price of naphtha.”

6. Subsequently, the Commission by its order dated 20.4.2007 in Petition No. 54/2007, extended the tariff for infirm power, approved vide order dated 25.10.2006 for a further period from 1.4.2007 to 30.6.2007, apart from enhancing the incidental charges from 30 paise /kWh to 71 paise/kWh. The Commission by its order dated 16.7.2007 in I. A .No.27/2007 (in Petition No.54/2007) further extended the validity of the said tariff order till 31.7.2007.

7. In the present petition, Petitioner No.1 has claimed tariff for the generating station based on 25 years Power Purchase Agreement (PPA) between the petitioners inter se, signed on 10.4.2007, as under:

*Fixed Charges - 101.6 Paise/kWh (levelised over 25 year period)
Fuel Charges - 204 Paise/kWh (as per GSA with GAIL) on R-LNG
- 197 Paise/kWh (as per GSA with IOCL and BPCL) on R-LNG*

8. Petitioner No.1 has also prayed for extension of tariff for the period from 1.8.2007 to 31.8.2007 as per the earlier order of the Commission dated 16.7.2007 allowing recovery of incidental charges @ 71 paise/kWh and fuel charge as pass through. The Commission by its order dated 1.10.2007 directed as under:

“9.The affidavit dated 17.9.2007 filed by the petitioners has been taken on record and the petitioner is allowed to charge the infirm power for the block I and III incidental charges @ 71 paise/kWh and fuel charge as pass through on actual till the date of commercial operation of the respective block. In case of block II, the infirm power rate shall be as per order dated 16.7.2007 to be applied from 1.8.2007 to 31.8.2007.

10. The petitioners shall decide between them about the nodal load dispatch centre-whether Maharashtra SLDC or the WRLDC. The specified nodal load dispatch centre shall be responsible for daily scheduling of the station, monitoring its operation, energy accounting, special energy metering and UI accounting. Till all this formally organized, the station shall supply power to MSEDCL on single-part tariff (fixed charge + fuel charge, both in paise/kWh) payable on actual energy sent out. Permission is granted for billing provisionally, as per power purchase agreement between the parties.”

9. The Commission after hearing on 4.12.2008 directed Petitioner No. 1 to file complete details for tariff determination, in the format prescribed under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004, (hereinafter “the 2004 regulations”). Petitioner No. 1 has filed the required information through a revised petition in terms of the 2004 regulations and has prayed that it be allowed provisional annual fixed charges of Rs 66380 lakh for the period 2007-08 and Rs 159485 lakh for the period 2008-09.

10. Prayas, an NGO, by its letter dated 31.8.2007 has raised a preliminary objection to the petition by stating that the petitioners have not sought tariff based on details and documentary evidence about the break-up of capital cost etc. It has also submitted that costs and tariff for the generating station should be approved by the

Commission by an independent judgment and not based on mutual understanding arrived at between the petitioners.

11. The preliminary objections raised by Prayas, have been taken care of. As stated above, the Commission after hearing on 4.12.2008 had directed Petitioner No.1 to submit the details necessary for approval of tariff as per the formats prescribed under the 2004 regulations and Petitioner No.1 has complied with the direction. Only after prudence check, the Commission has proceeded to determine tariff for the generating station, as discussed in the succeeding paragraphs.

Plant Capacity

12. Petitioner No. 1 filed interlocutory application I.A. No.34/2008 for amendment of the prayer in the main petition. It was submitted that the Original Equipment Manufacturer, (OEM) had assessed the maximum achievable capacity as 1970 MW under the current conditions with gas/RLNG as fuel, 27.2 deg.C. air temperature and frequency at 50 Hz, based on the performance results of Block-III and the estimation for Blocks I and II. Petitioner No.1 accordingly, has restructured the capacity of the generating station to 1940 MW as under:

Power block-I	640 MW
Power block-II	650 MW
Power block-III	650 MW
Total capacity	1940 MW

13. On the question of de-rating of capacity of the generating station, during the hearing held on 5.2.2009 it was submitted by Petitioner No.1 that the performance evaluation test was conducted by the OEM in the presence of officers of CEA and NTPC.

14. Under directions of the Commission, Petitioner No.1 vide affidavit dated 20.3.2009 has submitted a copy of CEA letter dated 17.3.2009 and it was noticed that the performance evaluation test was conducted for Block-III only and the gross nominal output of Block-III at site reference conditions was of the order of 668.54 MW after applying various correction factors. It was also observed by CEA that OEM would provide necessary recommendations for improvement in shortfall in capacity which was agreed to by the parties.

15. The generating station was under shutdown since May, 2001 and the gross capacity as per performance evaluation report of the CEA was 668.54 MW as against the original capacity of 740 MW. The performance evaluation has not been done on Blocks I & II. Block-II has the same capacity as Block-III and therefore, the capacity of the Block-III i.e 668.54 MW has also been considered for Block-II. The original capacity of Block-I was 670 MW but Petitioner No.1 has considered the capacity of 640 MW based on actual operating experience. As Block-I of the generating station is yet to be declared under commercial operation, the original capacity for Block-I of the generating station has been considered as 670 MW Accordingly, the capacity of the generating station has been considered as under:

Block-I	670.00 MW
Block-II	668.54 MW
Block-III	668.54 MW
Total capacity	2007.08 MW

16. In the above background, the capacity of the generating station for the purpose of tariff for the period 1.9.2007 to 31.3.2009 is as under:

Period	Capacity (MW)
1.9.2007 to 20.11.2007	668.54
21.11.2007 to 31.3.2009	1337.08

Capital cost

17. Regulation 17 of the 2004 regulations provide as under:

“Subject to prudence check by the Commission, the actual expenditure incurred on completion of the project shall form the basis for determination of final tariff. The final tariff shall be determined based on the admitted capital expenditure actually incurred up to the date of commercial operation of the generating station and shall include capitalized initial spares subject to following ceiling norms as a percentage of the original project cost as on the cut off date:

- (i) Coal based/lignite-fired generating stations -2.5%
- (ii) Gas Turbine/Combined cycle generating stations –4.0%

Provided that where the power purchase agreement entered into between the generating company and the beneficiaries provides a ceiling of actual expenditure, the capital expenditure shall not exceed such ceiling for determination of tariff.

Provided further that in case of the existing generating stations, the capital cost admitted by the Commission prior to 1.4.2004 shall form the basis for determination of tariff”.

18. Petitioner No. 1 by affidavit dated 30.4.2009, has considered the gross block of Rs. 712197 lakh as on 31.3.2008. The details of the claim are as under:

(Rs in lakh)	
Particulars	Amount
Block-II (as on date of commercial operation)	222024
Block-III (as on date of commercial operation)	217268
Common Assets	124758
IDC on Block-II plus Common Assets (paid on actual)	5070
IDC on Block-III (paid on actual)	1526
Apportioned cost of LNG Terminal on Block-II and III	141551
Total	712197

19. Accordingly, capital cost for the purpose of tariff has been worked out as under:

(Rs in lakh)

Particulars	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	1.4.2008 to 31.3.2009
Block-II (as on date of commercial operation)	222024	222024	222024
Common Assets	124758	124758	124758
Block-III (as on date of commercial operation)	0	217268	217268
IDC on Block-II plus Common Assets (paid on actual)	5070	5070	5070
IDC on Block-III (paid on actual)	0	1526	1526
Less: Liabilities not paid	20	5648	22
Total	351832	564997	570624

Debt-Equity Ratio

20. Regulation 20 of the 2004 regulations, provide as under:

(1) *In case of the existing project, debt–equity ratio Considered by the Commission for fixation of tariff for the period ending 31.3.2004 shall be considered for determination of tariff.*

(2) *In case of the generating stations for which investment approval was accorded prior to 1.4.2004 and which is likely to be declared under commercial operation during the period 1.4.2004 to 31.3.2009, debt-equity in the ratio of 70:30 shall be considered:*

Provided that where deployment of equity is less than 30%, the actual equity deployed shall be considered for the purpose of determination of tariff.

Provided further that the Commission may in appropriate case consider equity higher than 30% for the purpose of determination of tariff, where the generating company is able to establish to the satisfaction of the Commission that deployment of equity more than 30% was in the interest of general public;

(3) *In case of the generating stations for which investment approval is accorded on or after 1.4.2004, debt-equity in the ratio of 70:30 shall be considered for the purpose of determination of tariff:*

Provided that where deployment of equity is less than 30%, the actual equity deployed shall be considered for the purpose of determination of tariff.

(4) *The debt and equity amount arrived at in accordance with above sub-clause (1), (2) or (3), as the case may be, shall be used for calculation of interest on loan, return on equity, advance against depreciation and foreign exchange rate variation.”*

21. The generating station has been taken over by Petitioner No.1 under special circumstances and it is still undergoing financial restructuring. Petitioner No.1 has calculated debt-equity ratio as under:

(Rs in lakh)		
Particulars		Ratio in %
Equity	176500	24.78
Debt	535697	75.22
Total	712197	100

22. Since the generating station was taken over by making upfront payment and financial restructuring is still in progress, the above ratio may undergo change at a later date. The equity component shown above is inclusive of Rs 26500 lakh as 'sweat equity'. Based on the clarification submitted by Petitioner No.1, in its affidavit 19.3.2009, equity claimed has been allowed and considered for the purpose of tariff. Normative debt and equity as on 1.9.2007, 21.11.2007 and 1.4.2008 has been worked out on admissible capital cost (incurred on actuals) in the debt-equity ratio of 75.22: 24.78 as claimed by Petitioner No.1.

Return on Equity

23. As per clause (iii) of Regulation 21 of the 2004 regulations, return on equity shall be computed on the equity base determined in accordance with regulation 20 @ 14% per annum. Equity invested in foreign currency is to be allowed a return in the same currency and the payment on this account is made in Indian Rupees based on the exchange rate prevailing on the date of billing. In accordance with these provisions, return on equity has been worked out at 14% per annum on the normative equity and shall be claimed as under:

(Rs in lakh)			
Return on Equity	2007-08	2007-08	2008-09
	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	
Normative Equity	87193	140020	141415
Return on Equity	2702	7070	19798

Target Availability

24. Petitioner No.1 by its affidavit dated 30.4.2009 has submitted that its actual target availability are 70.20% and 34.26% for the period 2007-08 and 2008-09 respectively.

25. The question of relaxation of target availability norms for the generating station during the period 1.9.2007 to 31.3.2009 to the extent of the actual availability, as prayed by Petitioner No.1 has been considered by the Commission. Petitioner No.1 has declared the date of commercial operation of the Block-II and III of the generating station as 1.9.2007 and 21.11.2007 respectively with the full knowledge that the generating station was not in a position to perform on sustained basis. It has been observed that the actual availability on annual basis was 70.20% in 2007-08, whereas the same has been reduced to 34.26% in the year 2008-09. The 2004 regulations provide that generation before the date of commercial operation shall be treated as infirm power and there was no compulsion for Petitioner No.1 to declare commercial operation of the unit/block prior to its stabilization. In the above background, relaxation of target availability norms for the generating station to the level of actual availability, for the purpose of tariff is not justified. The risk of such low level of operation of the generating station has to be borne by the generator. In view of this, the target availability for the generating station for the period 1.9.2007 to 31.3.2009 has been considered as 80 %.

Interest on loan

26. Clause (i) of Regulation 21 of the 2004 regulations provide that

“Interest on loan capital shall be computed loan wise on the loans arrived at in the manner indicated in regulation 20.

- (a) *The loan outstanding as on 1.4.2004 shall be worked out as the gross loan as per regulation 20 minus cumulative repayment as admitted by the Commission up to 31.3.2004. The repayment for the period 2004-09 shall be worked out on a normative basis.*
- (b) *Generating Company shall make every effort to swap the loan as long as it results in net benefit to the beneficiaries. The costs associated with such swapping shall be borne by the beneficiaries.*
- (c) *The changes to the loan terms and conditions shall be reflected from the date of such swapping and benefits passed on to the beneficiaries.*
- (d) *In case of any dispute, any of the parties may approach the Commission with proper application. However, the beneficiaries shall not withhold any payment as ordered by the Commission to the Generating Company during pendency of any dispute relating to swapping of loan.*
- (f) *In case any moratorium period is availed of by the Generating Company, depreciation provided for in the tariff during the years of moratorium shall be treated as repayment during those years and interest on loan capital shall be calculated accordingly.*

The Generating Company shall not make any profit on account of swapping of loan and interest on loan”

27. The interest on loan has been worked out as mentioned below:

- a) The normative loan outstanding of the generating station as on 1.9.2007, 21.11.2007 and 1.4.2008 in terms of the admitted capital cost and the debt-equity ratio approved above, are as under:

	(Rs.in lakh)		
	2007-08	2007-08	2008-09
	1.9.2007 to 20.11.2007	21.11.07 to 31.3.2008	
Gross normative loan	264639	424977	429209
Cumulative repayment upto the previous year/period	0	3933	14227
Net loan	264639	421044	414982

- b) Actual repayment of actual loan as submitted by Petitioner No. 1 in affidavit dated 29.4.2009 in line with the proposed financial restructuring has been considered for computation of normative

repayment of loan. Normative repayment is worked out as per formula below:

$$\text{Normative Repayment} = \frac{\text{Actual Repayment} \times \text{Normative Loan}}{\text{Actual Loan}}$$

- c) Normative repayment of loan or depreciation whichever is higher has been treated as repayment during the year.
- d) The weighted average rate of interest calculated on actual loan and actual repayment as considered above has been applied on normative loan for calculating interest on loan.

28. The computation of interest on loan by applying weighted average interest rate is appended herein below:

(Rs.in lakh)

Interest on Loan	2007-08	2007-08	2008-09
	1.9.2007 to 20.11.2007	21.11.07 to 31.3.2008	
Gross normative loan	264639	424977	429209
Cumulative repayment upto previous year/period	0	3933	14227
Net loan-opening	264639	421044	414982
Repayment during the year/period	3933	10293	28825
Net loan-closing	260706	410750	386157
Average loan	262673	415897	400570
Weighted average rate of interest on loan	3.7548%	3.7548%	4.0534%
Interest	2183	5632	16237

Depreciation

29. Sub-clause (a) of clause (ii) of Regulation 21 of the 2004 regulations provides that for the purpose of tariff, depreciation shall be computed in the following manner, namely:

“(i) The value base for the purpose of depreciation shall be the historical cost of the asset.

(ii) Depreciation shall be calculated annually based on straight line method over the useful life of the asset and at the rates prescribed in Appendix II to these regulations.

The residual life of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the historical capital cost of the asset. Land is not a depreciable asset and its cost shall be excluded from the capital cost while computing 90% of the historical cost of the asset. The historical capital cost of the asset shall include additional capitalization on account of Foreign Exchange Rate Variation up to 31.3.2004 already allowed by the Central Government/Commission.

(iii) On repayment of entire loan, the remaining depreciable value shall be spread over the balance useful life of the asset.

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

30. The weighted average rate of depreciation calculated by Petitioner No. 1 is 5.05%. Since asset-wise liability provision is not furnished, calculation of depreciation rate has been based on gross value of the assets as furnished by the petitioner at applicable rates as per Appendix-II to the 2004 regulations and applied on *pro rata* basis on the admissible capital cost. For certain assets which are not listed in Appendix-II the rates considered are as applicable to similar assets listed therein as considered in other tariff orders for the period 2004-09. Accordingly, the rate of depreciation of 5.05% has been adopted and the depreciation calculated is as under:

(Rs.in lakh)				
Depreciation		2007-08	2007-08	2008-09
		1.9.2007 to 20.11.2007	21.11.07 to 31.3.2008	
Rate of Depreciation	5.05%			
Depreciable value	90%	315644	507493	512557
Remaining Depreciable value		315644	503560	498330
Depreciation		3933	10293	28825

Advance against depreciation

31. As per sub-clause (b) of clause (ii) of Regulation 21 of the 2004 regulations, in addition to allowable depreciation, the generating company shall be entitled to Advance Against Depreciation, computed in the manner given hereunder:

AAD = Loan repayment amount as per regulation 21 (i) subject to a ceiling of 1/10th of loan amount as per regulation 20 minus depreciation as per schedule.

32. It is provided that Advance Against Depreciation shall be permitted only if the cumulative repayment up to a particular year exceeds the cumulative depreciation up to that year. It is further provided that Advance Against Depreciation in a year shall be restricted to the extent of difference between cumulative repayment and cumulative depreciation up to that year.

33. Petitioner No.1 has claimed Advance Against Depreciation based on repayment of the loan as considered for working out interest on loan. For working out Advance Against Depreciation, 1/10th of the loan has been worked out with reference to notional gross loan, while repayment of loan during the year has been worked out as mentioned at para 27 (b) above. Based on the above, the computation for Advance Against Depreciation, is shown hereunder:

(Rs in lakh)

Advance against Depreciation	2007-08	2007-08	2008-09
	1.9.2007 to 20.11.2007	21.11.07 to 31.3.2008	
1/10th of gross loan(s)	26464	42498	42921
Repayment of loan	3933	10293	28825
Minimum of the above	3933	10293	28825
Depreciation during the year	3933	10293	28825
(A) Difference	0	0	0
Cumulative Repayment of loan	3933	14227	43052
Cumulative Depreciation	3933	14227	43052
(B) Difference	0	0	0
Advance against Depreciation (Minimum of (A) and (B))	0	0	0

O&M Expenses

34. The O&M Expenses as claimed by Petitioner No. 1 are as under:

(Rs. in lakh)

Year	2007-08	2008-09
O&M Expenses	2729	30900

35. The O&M expenses considered by Petitioner No. 1 for the year 2007-08 are based on actuals and for the year 2008-09, based on estimation. However, no details of estimation have been submitted. The O&M expenses for the year 2008-09 works out to Rs. 23.11 lakh/MW as against the existing norms of Rs. 9.12 lakh/MW (without warranty spares) as specified by the Commission in the 2004 regulations. Petitioner No. 1 has submitted that all materials/services had to be imported from outside as they were not indigenously available. Petitioner No. 1 has further submitted that based on the consolidated O&M experience with 9FA advanced class machine, it would approach the Commission for fixation of O&M expense norms for advance class machine, on stabilization of plant.

36. The Commission at the hearing on 5.2.2009 directed Petitioner No. 1 to furnish detailed break-up and reasons for high O&M expenses. In response, Petitioner No.1 by its affidavit dated 20.3.2009 submitted that the norm of Rs. 9.12 lakh/MW for 2008-09 as laid down by the Commission in the 2004 regulations was for gas turbine/combined cycle generating stations 'other than small gas turbine' and not specifically for advanced class gas turbines. Petitioner No. 1 further submitted that consequent upon major replacement of parts and the overhauling of the units after particular fired hours of gas turbine, year on year basis, the O&M expenditure could vary to a great deal and could not be standardized. As such, the actual O&M expenses for the year 2007-08 are much lower than the estimated O&M expenses for the year 2008-09, as it has been explained.

37. Petitioner No.1 has also submitted that the machines of the generating stations are amongst the first few advanced class machines manufactured by the OEM which were abandoned for more than five years before revival. Therefore, guarantee/warranty was not available from the OEM. Petitioner No. 1 has further submitted that all materials/services had to be imported from outside as they were not indigenously available and this had a greater bearing on the O&M expenses. It has been submitted by Petitioner No.1 that the amount of Rs. 30900 lakh for the year 2008-09 also includes expenditure of Rs. 5000 lakh incurred on the repairs of damaged machines during the year.

38. Petitioner No.1 by its affidavit dated 30.4.2009 has revised the claim for the O&M expenses (on actual) as under:

(Rs in lakh)		
	2007-08	2008-09
O&M expenses	2263	26801

39. The O&M expenses norms for the tariff period 2004-09 in respect of gas/liquid fired generating stations, are also applicable to generating stations with advanced class machines. The major expenditure in the O&M expenses for the year 2008-09 is towards the repair and maintenance cost for refurbishment and overhaul of gas turbine and steam turbine, replacement of major parts like fuel nozzles, combustion liners etc. amounting to Rs. 19118 lakh, out of the total expenditure of Rs. 26801 lakh.

40. The claim of Petitioner No.1 for O&M expenses for the year 2007-08, based on actuals, works out to Rs. 3.32 lakh MW/year, which is lesser than the norms for the O&M expenses specified under the 2004 regulations. However, for the year 2008-09, the claim is higher. On prudence check of the O&M expenses (at actuals) for the year 2008-09, it is noticed that a major portion of the repair and maintenance expenditure relates to repair and replacement of failed GT component which is not a routine expenditure. The O&M expenses for the year 2008-09 include expenditure in the nature of major overhaul and refurbishment undertaken during the year succeeding the date of commercial operation, which are normally incurred after 4 to 5 years of operation of the generating station.

41. The Commission is fully conscious of the distinctive characteristic of gas/liquid fuel based generating stations, in which O&M vary from year to year on account of inspections and overhauls required after certain hours of operational cycle. This

aspect has been taken care of while laying down the norms in the 2004 regulations for gas turbine/combined cycle generating stations other than small gas turbine generating stations, without warranty spares, for the tariff period 2004-09 as under:

(Rs. in lakh per MW)					
Year	2004-05	2005-06	2006-07	2007-08	2008-09
O&M expenses	7.80	8.11	8.44	8.77	9.12

42. Based on the above, the O&M expenses allowed are as under:

Year	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	2008-09
Capacity (MW)	668.54	1337.08	1337.08
O&M expenses allowed (Rs in lakh)	1298	4229	12194

Interest on Working Capital

43. In accordance with clause (v) of Regulation 21 of the 2004 regulations, working capital in case of Gas Turbine /Combined cycle generating stations shall cover:

- (i) Fuel cost for one month, corresponding to the target availability duly taking into account the mode of operation of the generating station on gas fuel and liquid fuel;
- (ii) Liquid fuel stock for ½ month;
- (iii) Operation and Maintenance expenses for one month;
- (iv) Maintenance spares @ 1% of the historical cost escalated @ 6% per annum from the date of commercial operation; and
- (v) Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on the target availability

44. Under the 2004 regulations, the rate of interest on working capital shall be on a normative basis and shall be equal to the short-term Prime Lending Rate of State Bank of India as on 1.4.2004 or on 1st April of the year in which the generating station or a unit thereof is declared under commercial operation, whichever is later. Interest on working capital shall be payable on normative basis notwithstanding that the generating company has not taken working capital loan from any outside agency.

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

(a) **Fuel cost:** Petitioner No.1 has claimed following cost for fuel component in working capital, based on price and GCV of gas and liquid fuel procured and burnt in years 2007-08 and 2008-09.

Particulars	(Rs.in lakh)	
	2007-08	2008-09
Fuel cost for 1 month	6630	15428
Liquid fuel stock for ½ month	9204	19528

Since the generating station is operating on R-LNG /Natural gas and not on liquid fuel, the fuel considered is gas for the purposes of working capital. The cost of fuel has been worked out for one month at 80% target availability as under:

Year	(Rs.in lakh)		
	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	2008-09
Cost of fuel for one month (annualized)	7100	14199	14199

(b) **Liquid Fuel Stock:** The cost of liquid fuel is considered as 'nil'.

- (c) **O&M Expenses:** O&M expenses for working capital have been worked out for 1 month of O&M expenses considered in tariff of the respective year.
- (d) **Spares:** The spares requirement has been worked out based on the admissible capital cost as on date of commercial operation and escalated @ 6% per annum to arrive at permissible spares for the relevant years.
- (e) **Receivables:** The receivables have been worked out on the basis of two months of fixed and variable charges considering the operational parameters and weighted average price of fuel. The supporting calculations in respect of receivables are tabulated hereunder:

(Rs in lakh)

	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	2008-09
Variable charges (Ex-bus) (Gas) (Rs/kwh)	1.875	1.875	1.875
Variable charges for the period	18906	61620	170390
Variable charges -2 months	3151	10270	28398
Fixed charges - 2 months	1844	5022	14192
Receivables	4995	15292	42590

- (f) **Rate of interest on working capital:** The average SBI PLR of 12.75 % as on 1.9.2007 has been considered as the rate of interest on working capital during the period 1.9.2007 to 31.3.2009.

46. The necessary details in support of calculation of interest on working capital are appended below:

Calculation of Interest on Working Capital

(Rs in lakh)

	1.9.2007 to 20.11.2007	21.11.2007 to 31.3.2008	2008-09
Fuel Cost	1576	5135	14199
O & M expenses	108	352	1016
Spares	779	2038	5706
Receivables- 2 months	4995	15292	42590
Total Working Capital	7458	22818	63512
Rate of Interest	12.75%	12.75%	12.75%
Interest on Working Capital	951	2909	8098

Annual Fixed charges

47. The fixed charges for the period 1.9.2007 to 31.3.2009 allowed in this order are summed up as below:

(Rs. in lakh)

Particulars	2007-08 1.9.2007 to 20.11.2007	2007-08 21.11.2007 to 31.3.2008	2008-09
Depreciation	3933	10293	28825
Interest on Loan	2183	5632	16237
Return on Equity	2702	7070	19798
Advance against Depreciation	0	0	0
Interest on Working Capital	951	2,909	8,098
O & M Expenses	1298	4229	12194
Total	11066	30134	85152

Gross Station Heat Rate

48. Petitioner No.1 has submitted that during the years 2007-08 and 2008-09 the gross station heat rate was considered as 1887 Kcal/kWh instead of 1850 Kcal/kWh as per the 2004 regulations, as the inlet air cooling from LNG terminal would not be available. Petitioner No.1 has also submitted that since R-LNG facility was being transported through pipeline, a degradation factor of 2% was agreed to between the petitioners at the time of negotiation of the PPA, till R-LNG was not made available from LNG terminal of Dabhol. Petitioner No.1 further submitted that one stream of the LNG terminal was likely to be completed by March, 2009 and entire LNG

terminal by September, 2011. In case of Naphtha, Petitioner No.1 has considered the Station Heat Rate of 2000 kCal/kWh.

49. The Commission directed Petitioner No.1 to furnish the details of actual Station Heat Rate of Block-II and Block-III for the years 2007-08 and 2008-09. From the data submitted by Petitioner No.1 it is noticed that the average Station Heat Rate achieved on R-LNG for Block-II and Block-III (combined) during the years 2007-08 and 2008-09 was of the order of 1882 kcal/kWh and 1830 kcal/kWh respectively, for an average loading of Block-II and Block-III of 78.03% and 77.83% for the respective year. Considering the performance for the year 2008-09, Petitioner No.1 has not made out a case for relaxation of heat rate norm on R-LNG/natural gas based on agreement between the petitioners. In case of Naphtha, since the generating station is firing R-LNG/natural gas after the date of commercial operation, there appears to be no case for specifying heat rate norm for Naphtha firing separately at this stage.

Frequency correction in schedules

50. Petitioner No.1 has submitted that in case of variance in the grid frequency from standard 50 Hz, the outputs of gas turbine vary significantly. Petitioner No.1 has prayed to allow frequency corrections to the schedules as per the correction curves. The 2004 regulations provide for frequency correction to schedule generation for all gas/liquid based stations. Hence, in our view, specific relaxation for the generating station has not been allowed.

Energy charges

51. Petitioner No.1 has considered the following energy charges for the year s 2007-08 and 2008-09:

Combined Cycle	2007-08 (Paise/kWh)	2008-09 (Paise/kWh)
Energy Charges Ex.bus (Gas)	191.21	209.50
Energy Charges Ex.bus (Naphtha)	516.40	516.40

52. The following parameters for closed cycle operation have been considered by Petitioner No.1 for energy charge calculation:

	2007-08	2008-09
A.E.C.	3%	3%
Station Heat Rate on LNG (Kcal/kWh)	1887	1887
Station Heat Rate on Naptha (Kcal/kWh)	2000	2000
GCV of Gas (Kcal/SCM)	9781	9820
GCV of Liquid fuel (Kcal/Lt.)	7986	7986
Price of Gas (Rs./1000 SCM)	9614	10576
Price of Liquid fuel (Rs./KL)	21198	21198

53. The base energy charges worked out are based on the Station Heat Rate norm of 1850 kcal/kWh for closed cycle operation considering the price and GCV of gas procured in the year 2007-08 (as the three month's data prior to the date of commercial operation is not available) as the generating station operates under RLNG/gas only after the date of commercial operation as per the following computation:

Description	Unit		
Capacity	MW	668.540	1337.08
Normative PLF/Availability	Hours/Kw/year	7008.00	7008.00
Gross Station Heat Rate corresponding to GCV	kCal/kWh	1850.00	1850.00
Aux. Energy Consumption	%	3%	3%
Weighted Average GCV of Gas	kCal/SCM	9781.00	9781.00
Weighted Average price of Gas	Rs/1000 SCM	9614.00	9614.00
Rate of Energy Charge from Gas	Paise/kWh	181.84	181.84
Rate of Energy Charge ex-bus per kWh sent on gas	Paise/kWh	187.47	187.47

54. Petitioner No.1 by its affidavit dated 30.4.2009 has claimed revised rate of energy charges of 227.50 paise/kWh for gas and 517.89 paise/kWh for liquid for the period 2007-08 and 2008-09. It has been observed that change in the energy rate is on account of the change in the price and GCV of fuels. Petitioner No.1 has not provided sufficient justification for the revision of fuel price and GCVs and hence the revised rate of energy charges as claimed has not been gone into. Since only the base energy charge rate based on the fuel price and GCV of fuels has been worked out, any recovery of actual energy charges rate for changes in price and GCVs of fuels would be covered under the Fuel Price Adjustment (FPA) formula provided hereunder.

55. The Base Rate of Energy Charges (BREC) have been calculated on base value of GCV, base price of fuel for the year 2007-08, and normative operating parameters other than Station Heat Rate and are subject to fuel price adjustment. as per following formula:

$$\mathbf{FPA} = \frac{10 \times (\text{SHR}_n) \times (P_m/K_m) - (P_s/K_s)}{(100 - \text{AC}_n)}$$

Where,

FPA = Fuel price Adjustment for a month in Paise/kWh Sent out

SHR_n = Normative Gross Station Heat Rate expressed in
kCal/kWh

AC_n = Normative Auxiliary Consumption in percentage

P_m = Weighted average price of Gas or Liquid fuel as per PSL for
the month in Rs. / 1000 SCM of Rs./ KL or Rs./MT

K_m = Weighted average gross calorific value of Gas or Liquid fuel

for the month in Kcal/ SCM or kCal/ Litre or kCal/ Kg

P_s = Base price of Gas or Liquid fuel as taken for determination of base energy charge in tariff order in Rs. / 1000 SCM of Rs./ KL or Rs./MT

K_s = Base value of gross calorific value of Gas or Liquid fuel as taken for determination of base energy charge in tariff order in Kcal/ SCM or kCal/ Litre or kCal/ Kg

56. Fuel Price Adjustment shall further be subjected to adjustment for monthly operating pattern adjustment (MOPA) for percentage open cycle operation as certified by REB/SLDC and corresponding to Gross Station Heat Rate of 2685 kCal/kWh and auxiliary energy consumption of 1%, as per formula given below:

$$\text{MOPA} = (\text{BEC} + \text{FPA}) \times \left[\frac{\{(SHR_{no})/(100-AC_{no})\}}{\{(SHR_{nc})/(100-AC_{nc})\}} - 1 \right] \times \text{POCM}/100$$

Where,

MOPA - Monthly Operating Pattern Adjustment in Paise/kWh Sent Out

BEC - Base Energy Charge as per tariff order in Paise/kWh sent out

FPA - Fuel price Adjustment for a month in Paise/kWh Sent out

SHR_{no} - Normative Gross Station Heat Rate for Open cycle operation expressed in kCal/kWh (2900 kCal/kWh)

SHR_{nc} - Normative Gross Station Heat Rate for Combined cycle operation expressed in kCal/kWh (2000 kCal/kWh)

AC_{no} - Normative Auxiliary Consumption for Open cycle operation in percentage (1%)

AC_{nc} - Normative Auxiliary Consumption for Combined cycle operation in percentage (3%)

POCM - Open cycle generation during the month in percentage

57. Since there is provision for monthly operating pattern adjustment to take care of open cycle operation, there is no need for specifying base energy charges for open cycle.

58. In addition to the charges approved above, Petitioner No.1 is entitled to recover other charges also like claim for reimbursement of income tax, other taxes, cess levied by statutory authority and other charges in accordance with the 2004 regulations.

Reimbursement of publication charges

59. Petitioner No.1 has confirmed publication of public notices and submitted copies of the notices vide its affidavit dated 9.8.2007, but the expenditure incurred in this regard is not available on record. We direct that Petitioner No.1 shall claim reimbursement of the said expenditure directly from the Petitioner No.2 in one installment on production of evidence of incurring expenditure.

60. Petitioner No.1 is already billing Petitioner No.2 on provisional basis in accordance with the Commission's earlier directions. The provisional billing of tariff shall be adjusted in the light of final tariff now approved by us.

61. This order disposes of Petition No.96/2007

Sd/-
(V.S.VERMA)
MEMBER

Sd/-
(S.JAYARAMAN)
MEMBER

Sd/-
(R. KRISHNAMOORTHY)
MEMBER

Sd/-
(Dr. PRAMOD DEO)
CHAIRPERSON

New Delhi dated the 4th day of June, 2009