

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Coram**

1. **Shri Ashok Basu, Chairperson**
2. **Shri K.N.Sinha, Member**
3. **Shri. Bhanu Bhushan, Member**
4. **Shri A.H. Jung, Member**

**Petition No 155/2004**

**In the matter of**

Approval of tariff in respect of Dadri Gas Power Station, for the period from 1.4.2004 to 31.3.2009.

**And in the matter of**

National Thermal Power Corporation Ltd.

.....**Petitioner**

**Vs**

1. Uttar Pradesh Power Corporation Limited, Lucknow
2. Jaipur Vidyut Vitran Nigam Limited, Jaipur
3. Ajmer Vidyut Vitran Nigam Limited, Ajmer
4. Jodhpur Vidyut Vitran Nigam Limited, Jodhpur
5. Delhi Transco Limited, New Delhi
6. Haryana Vidyut Prasaran Nigam Limited, Panchkula (Haryana)
7. Punjab State Electricity Board, Patiala
8. Himachal Pradesh State Electricity Board, Shimla
9. Power Development Department Government of Jammu & Kashmir, Jammu
10. Power Department, Union Territory of Chandigarh, Chandigarh
11. Uttaranchal Power Corporation Limited, Dehradun

..**Respondents**

**The following were present**

1. Shri V.B.K. Jain, NTPC
2. Shri I.J. Kapoor, NTPC
3. Shri S.D. Jha, NTPC
4. Shri Manoj Saxena, NTPC
5. Shri Shankar Saran, NTPC
6. Shri D.G. Salpekar, NTPC
7. Shri A.S. Sardana, NTPC
8. Shri Gaurav Maheshwari, NTPC
9. Shri R. Singhal, NTPC
10. Shri S.K. Samvi, NTPC
11. Shri Balaji Dubey, NTPC
12. Shri P.K. Gupta, Jodhpur Discom, Jodhpur
13. Shri S.K. Yadav, JVVNL, Jaipur
14. Shri T.K. Srivastava, UPPCL

15. Shri B.K. Paliwal, DTL
16. Shri V.K. Malhotra, DTL
17. Shri T.P.S. Bawa, OSD, PSEB
18. Shri R.K. Arora, HPGCL

**ORDER**  
**(DATE OF HEARING : 21.2.2006)**

This petition has been filed by the petitioner, a generating company owned and controlled by the Central Government for approval of tariff in respect of Dadri Gas Power Station, (hereinafter referred to as “the generating station”) for the period from 1.4.2004 to 31.3.2009 based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004, (hereinafter referred to as “the 2004 regulations”).

2. The generating station with a total capacity of 829.78 MW comprises of 4 gas turbine and 2 steam turbine units. Units, 1, 2, 4 and 5 have a capacity of 130.19 MW each and Units 3 and 6 have a capacity of 154.51 MW each. The first gas turbine of the generating station was declared under commercial operation on 1.5.1992 and the last steam turbine on 1.4.1997.

3. The tariff for the generating station for the period from 1.4.2001 to 31.3.2004 was approved by the Commission vide its order dated 24.10.2003 in Petition No 44/2001 based on capital cost of Rs. 86633 lakh as on 31.3.2001. The fixed charges as approved by the Commission were as under:

(Rs. In lakh)			
Year	2001-02	2002-03	2003-04
Fixed Charges	21982	21506	21096

4. Subsequently, the Commission vide order dated 13.4.2005 in petition No. 167/2004, approved additional capital expenditure of Rs.1341.48 lakh for the period 2001-2004 against a claim of Rs. 4774 lakh.

5. The details of the fixed charges claimed by the petitioner in the present petition, are given hereunder:

(Rs. in lakh)

<b>Particulars</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Depreciation	4346	4346	4346	4346	4346
Interest on Loan	3210	2366	1522	801	402
Return on Equity	6158	6158	6158	6158	6158
Advance against Depreciation	0	0	0	0	0
Interest on Working Capital	4292	4291	4292	4306	4305
O & M Expenses	5934	6171	6418	6675	6942
<b>TOTAL</b>	<b>23940</b>	<b>23332</b>	<b>22736</b>	<b>22286</b>	<b>22153</b>

6. The details of interest on working capital furnished by the petitioner and its claim for interest thereon are summarised hereunder:

(Rs. in lakh)

	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Fuel Cost	8236	8236	8236	8258	8236
HSD stock ½ month	11361	11361	11361	11392	11361
Spares	1317	1396	1480	1568	1662
O & M expenses	494	514	535	556	578
Receivables	20461	20360	20261	20231	20164
Total Working Capital	41869	41867	41873	42005	42001
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
<b>Total Interest on Working capital</b>	<b>4292</b>	<b>4291</b>	<b>4292</b>	<b>4306</b>	<b>4305</b>

7. In addition, the petitioner has claimed the energy charges as under subject to adjustment for fuel price:

Description	Unit	Combined Cycle	Open Cycle
Rate of Energy Charge ex-bus per kWh sent (GAS)	Paise/ kWh	93.29	132.59
Rate of Energy Charge ex-bus per kWh sent (HSD)	Paise/ kWh	483.39	687.05

8. The reply to the petition before amendment was filed by Jodhpur Vidyut Vitran Nigam Ltd, Uttar Pradesh Power Corporation Ltd, Punjab State Electricity Board, and Haryana Vidyut Prasaran Nigam Limited. The other respondents have not filed any reply. The petitioner has published notices in accordance with the procedure specified by the Commission. However, no objections or suggestions have been received in response to these notices.

9. There is a general issue regarding treatment of depreciation when it exceeds repayment of loan in a year. The Commission in its order dated 5.5.2006 in Petition No.162/2004 (NTPC Vs UPPCL and Another) has decided that when depreciation recovered in a year is more than the amount of repayment during that year, the entire amount of depreciation is to be considered as repayment of loan for tariff computation. Similar approach has been adopted by the Commission, while approving tariff in respect of the transmission assets of PGCIL, and in the interest of consistency and continuity of approach same methodology needs to be followed in case of the petitioner also. Accordingly, the decision arrived at in the order dated 5.5.2006 in Petition No.162/2004 will be followed in this case.

### **CAPITAL COST**

10. As per the second proviso to Regulation 17 of the 2004 regulations in case of the generating stations existing up to 31.3.2004, the capital cost admitted by the Commission for determination of tariff prior to 1.4.2004 shall form the basis for determination of tariff.

11. The petitioner in the amended petition has considered the capital expenditure of Rs. 87974 lakh after accounting for additional capitalization of Rs. 1341 lakh for the period 2001-2004 over the capital cost of Rs.86633 lakh considered by the Commission in its order dated 24.10.2003 in Petition No.44/2001. As the project does not involve any foreign loan, the petitioner has not claimed any FERV.

12. The Commission vide its order dated 13.4.2005 in Petition No.167/2004 has admitted the following additional capitalisation for the period 2001-2004 for the purpose of tariff for the period 2004-09.

(Rs. In lakh)	
Year	Additional Capitalisation allowed
2001-02	363.79
2002-03	602.65
2003-04	375.05
<b>Total</b>	<b>1341.49</b>

13. Based on the above, after adjustment of additional capitalisation of Rs 1341 lakh on account of works, the gross block as on 1.4.2004 comes to Rs.87974 lakh as claimed, as per details given hereunder:

(Rs. in lakh)	
Capital cost admitted as on 31.3.2001.	86633
Additional Capitalization as approved for the years 2001-2004	1341
FERV admitted for the tariff period 2001-2004	0.00
<b>Opening Capital cost as on 1.4.2004 for the tariff period 2004-2009</b>	<b>87974</b>

### **DEBT-EQUITY RATIO**

14. Clause (1) of Regulation 20 of the 2004 regulations *inter alia* provides that in case of the existing generating stations, 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.

15. The Commission, while approving tariff for the period from 1.4.2001 to 31.3.2004 vide its order dated 24.10.2003 in Petition No 44/2001 had considered the normative debt-equity ratio of 50:50. Therefore, for the purpose of present petition, debt-equity ratio of 50:50 has been adopted in the working. Additional capitalisation on account of works has been deemed to have been financed through debt and equity in the ratio of 50:50. Accordingly, for the purpose of tariff, an amount of Rs. 43987 lakh has been considered as equity as on 1.4.2004.

#### **TARGET AVAILABILITY**

16. The petitioner has considered Target Availability of 80%, based on the provisions of the 2004 regulations. Accordingly, Target Availability of 80 % has been considered for recovery of full fixed charges and computation of fuel element in the working capital for the period from 1.4.2004 to 31.3.2009.

#### **RETURN ON EQUITY**

17. 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 due date of billing.

18. The petitioner has claimed return on equity of Rs. 43987 lakh after accounting for equity on account of additional capitalization on works for the period 1.4.2001 to 31.3.2004. This claim has been accepted. The return on equity has been worked out on the average normative equity. The charges payable by the respondents on account of return on equity would be Rs 6158 lakh each year.

### **INTEREST ON LOAN**

19. Clause (i) of regulation 21 of the 2004 regulations *inter alia* provides that,-

(a) Interest on loan capital shall be computed loan-wise on the loans arrived at in the manner indicated in regulation 20.

(b) 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 for the period up to 31.3.2004. The repayment for the period 2004-09 shall be worked out accordingly on normative basis.

(c) The generating company shall make every effort to swap the loan as long as it results in net benefit to the long-term transmission customers. The costs associated with such swapping shall be borne by the long-term transmission customers.

(d) The changes to the loan terms and conditions shall be reflected from the date of such swapping and benefits passed on to the beneficiaries.

(e) In case any moratorium period is availed of by the transmission licensee, 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.

20. In the instant case, the fixed charges for the period prior to 1.4.2004 was allowed by the Commission on normative debt. Therefore the interest on loan has been worked out as below:

(a) The gross opening normative loan amount has been taken as per the Commission's order dated 24.10.2003 in petition No. 44/2001.

(b) The cumulative repayment of loan up to 31.3.2004 has also been taken as per Commission's order dated 24.10.2003 in petition No. 44/2001.

(c) The annual repayment amount for the year 2004-05 to 2008-09 has also been worked out as follows:

Actual repayment during the year x normative net loan at the beginning of the year/actual net loan at the beginning of the year,

(d) Where the normative loan re-payment in a year is less than the depreciation of that year, the repayment has been considered to the extent of depreciation.

(e) On the basis of actual rate of interest as on 1.4.2004 on actual basis, the weighted rate of interest on average loan is worked out and the same has been applied on the normative average loan during the year to arrive at the interest on loan.

(f) In the present petition, GOI loans bearing interest rates ranging from 14% to 17% have been pre-paid by Bonds of series bearing interest rates 8.05% to 9.55%. on analysis of terms and conditions of Bonds it has been found that interest on original GOI loans is higher than the interest on Bonds. As such, the terms and conditions of refinanced loans have been considered in the present loan computations.

(g) The loan drawals up to 31.3.2004 only have been considered.



21. Based on the above, the interest on loan has been computed as given below:

**COMPUTATION OF INTEREST ON LOAN**

(Rs. in lakh)

	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2009-04</b>
Gross loan-Opening	43987	43987	43987	43987	43987
Cumulative repayments of Loans up to previous year	26712	31040	35369	39697	43987
Net loan-Opening	17275	12947	8618	4290	0
Increase/ Decrease due to FERV	0	0	0	0	0
Increase/ Decrease due to Additional Capitalisation	0	0	0	0	0
<b>Total</b>	<b>17275</b>	<b>12947</b>	<b>8618</b>	<b>4290</b>	<b>0</b>
Repayments of Loans during the year	4328	4328	4328	4290	0
Net loan-Closing	12947	8618	4290	0	0
Average Net Loan	15111	10782	6454	2145	0
Rate of Interest on Loan	9.13%	9.13%	9.16%	9.26%	9.32%
<b>Interest on loan</b>	<b>1380</b>	<b>984</b>	<b>592</b>	<b>199</b>	<b>0</b>

**DEPRECIATION**

22. Sub-clause (a) of clause (ii) of Regulation 21 of the 2004 regulations provides for computation of depreciation 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 value 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 capitalisation 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.

23. The cost of land in the present case is Rs. 68.76 lakh. The gross depreciable value of the asset, excluding land cost, as per (ii) above, is  $0.9 \times (\text{Rs. } 87974 \text{ lakh} - \text{Rs. } 68.76 \text{ lakh}) = \text{Rs. } 79115 \text{ lakh}$ . Cumulative depreciation and AAD recovered in tariff up to 31.3.2004 is Rs. 57019 lakh, including depreciation on additional capitalization for the period 1.4.2001 to 31.3.2004. Remaining depreciable value as on 1.4.2004 is thus Rs.22096 lakh.

24. The weighted average depreciation rate (excluding cost of land) calculated by taking the individual assets of gross block as on 31.3.2004 works out to 4.92% as against weighted average rate of 4.84% claimed in the petition. based on asset-wise depreciation corresponding to a gross block of Rs.87974 lakh. Further, as the entire notional loan has been repaid in 2007-08, the remaining value of the assets has been distributed over the balance useful life of the assets in the year 2008-09.

25. Based on the above, for the period 1.4.2004 to 31.3.2009 the depreciation works out to Rs.4328 lakh each year from 2004-05 to 2007-08 and Rs.1494 lakh during 2008-09 as shown below:

(Rs. in lakh)

Details of Depreciation	Up to 31.3.2004	2004-05	2005-06	2006-07	2007-08	2008-09
Gross Block as on 31.3.2004	87973.88					
Depreciable Value	79115					
Balance Useful life of the asset		7.2	6.2	5.2	4.2	3.2
Remaining Depreciable Value	22096	17767	13439	9111	4782	3288
Depreciation	42624	4328	4328	4328	4328	1494

### **ADVANCE AGAINST DEPRECIATION**

26. As per sub-clause (b) of clause (ii) of Regulation 56 of the 2004 regulations, in addition to allowable depreciation, the transmission licensee is entitled to Advance Against Depreciation, computed in the manner given hereunder:

AAD = Loan repayment amount as per regulation 56 (i) subject to a ceiling of 1/10th of loan amount as per regulation 54 minus depreciation as per schedule

27. 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.

28. The petitioner has not claimed Advance Against Depreciation. Therefore, the petitioner's entitlement to Advance Against Depreciation is "nil".

## **O&M EXPENSES**

29. The 2004 regulations have prescribed the following O&M expense norms for gas turbine/Combined Cycle generating stations, other than small gas turbine power generating station with warranty spares -

		(Rs. in lakh/MW)				
Year		2004-05	2005-06	2006-07	2007-08	2008-09
O&M expenses/ MW		5.2	5.41	5.62	5.85	6.08

30. The petitioner has claimed O&M expenses as detailed below, stated to have been worked out based on actual expenses for the preceding 5 years, that is, 1999-2000 to 2003-04:

Years	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses (Rs in. lakh)	5934	6171	6418	6675	6942

31. The petitioner has stated that the normative O&M expenses specified in the 2004 regulations are highly inadequate in case of gas-based generating stations. The petitioner has, therefore, submitted that O&M expenses should be based on actual figures for it to be more realistic.

32. The petitioner has submitted that the 10 year warranty period has expired in April 2002 and O&M charges claimed by them are higher than the normative O&M expenses due to the following reasons:

- (i) Higher repair and maintenance (R&M) expenses due to aging, higher replacement cost of spares, equipment failure etc. and

- (ii) Inclusion of cost of spares consumed at actuals after the warranty period and inclusion of additional capitalisation disallowed.

33. The Commission vide order dated 16.2.2006 had directed the petitioner to place on record the following information before a view on the revision of O&M expenses for the five gas based stations was taken:

- (a) Details of actual O&M expenses from the date of commercial operation of 1<sup>st</sup> GT of each of the generating stations to 2004-05,
- (b) O&M expenses recovered in tariff from the date of commercial operation of 1<sup>st</sup> GT to 2004-05;
- (c) Whether or not the capital spares issued at zero cost already included in the capital cost for the purpose of tariff; and
- (d) Basis of estimation of embedded cost of spares in respect of each of the above named gas based generating stations.

34. The issue of revision of O&M expenses as claimed by the petitioner shall be considered on merits after filing of the above information by the petitioner, after a comprehensive examination of the issue for all the five gas based generating stations of the petitioner. In the meanwhile, tariff is being awarded with O&M based the 2004 regulations.

35. The petitioner has prayed for a specific deviation pertaining to water charges in O&M. The petitioner has submitted that in the past years, the State Governments have been resorting to manifold increase in the rates of water charges / royalty

payable, which is not normally based on common commercial principles. Therefore, this increase cannot be covered under the normal O&M expenses allowed in the tariff. The petitioner has, therefore, submitted that any increase in the rates of water charges / royalty etc. by more than 4% per annum over the rates prevailing on 31.3.2004 should be additionally payable by the respondent beneficiaries.

36. The normative O&M expenses were finalized by the Commission after going through the transparent process of hearing and consulting all concerned and were based on the data furnished by the concerned utilities for different components of O&M, including water charges. Further, an escalation of 4% per year is inbuilt in the normative O&M expenses specified by the Commission. There may be other heads in O&M expenses where actual expenses may be less than the normative expenses specified by the Commission. Therefore, we do not consider it to be justified to allow increase under one head, that is, water charges in isolation. As such, the direct recovery of additional O&M expenses on account of any increase in the rates of water charges / royalty etc. during tariff period cannot be allowed. However, the petitioner is at liberty to approach the Commission in accordance with law for recovery of additional water charges with proper justification and details of actual expenses recovered under other heads if State Governments resort to abnormal increase in the rates of water charges / royalty.

37. Based on above discussion, the year-wise O&M expenses for the generating station work out as follows-

(Rs. in lakh)

Year	2004-05	2005-06	2006-07	2007-08	2008-09
<b>O&amp;M expenses</b>	<b>4315</b>	<b>4489</b>	<b>4663</b>	<b>4854</b>	<b>5045</b>

38. The petitioner has submitted that the wage revision of its employees is due with effect from 1.1.2007. Therefore, O &M expenses should be subject to revision on account of revision of employee cost from that date. In the alternative, it has been prayed that the increase in employee cost due to wage revision be allowed as per actuals for extra cost to be incurred consequent to wage revision. We are not expressing any view, as this issue does not arise for consideration at this stage. The petitioner may approach for a relief in this regard at an appropriate stage in accordance with law.

### **INTEREST ON WORKING CAPITAL**

39. In accordance with clause (v) of Regulation 21 of the 2004 regulations, working capital in case of gas based 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 at 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 target availability.

40. 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 1<sup>st</sup> 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.

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

**(a) Fuel Cost**

The petitioner has claimed following cost for fuel component in working capital based on price and GCV of gas and liquid fuel (HSD) for preceding three months from January 2004 to March 2004, stated to be based on actual operating pattern for 2003-04, that is, (79% Gas and 21% on Liquid Fuel-HSD).

Particulars	(Rs. in lakh)				
	2004-05	2005-06	2006-07	2007-08 (Leap Year)	2008-09
<b>Fuel Cost for 1 Month</b>	8236	8236	8236	8236	8236
<b>Liquid fuel stock for 1/2 month</b>	11361	11361	11361	11392	11362

The petitioner has claimed liquid fuel stock for ½ month by considering the availability of the generating station on liquid fuel through out the year. However, as noted above 79% availability of the generating station was declared on gas and the remaining 21% on liquid fuel. Therefore, the liquid fuel stock for ½ month is to be considered in proportion to the availability declared on that fuel and it has been calculated accordingly.



The petitioner has pleaded that there has been sharp rise in the fuel price in the recent months as a result of which there would be increase in the working capital and they will be filing a separate application for revision of IWC on account of steep and abnormal rise in fuel price. As per provisions of the 2004 regulations, interest on working capital has to be frozen as normative number at the beginning of the tariff setting based on the price and GCV of the fuel during preceding three months and prevailing applicable rate of interest and is not to be revised based on subsequent revision of the price of fuel or applicable rate of interest. As such, the prayer of the petitioner to allow interest on working capital based on escalated fuel price cannot be accepted. Accordingly, based on the weighted average GCV and price of fuels for the month of January 2004 to March, 2004, the fuel component in working capital works out as follows for different years during tariff period.

(Rs in lakh)

Description	1.4.2004 to 31.3.2007 and 1.4.2008 to 31.3.2009	1.4. 2007 to 31.3.2008 (Leap Year)
<b>Value of stock of HSD for 1/2 month</b>	<b>2376.21</b>	<b>2382.72</b>
<b>Fuel Cost-1Month</b>	<b>8218.64</b>	<b>8241.15</b>

**(b) O&M Expenses:** O&M expenses for working capital have been worked out for 1 month of O&M expenses approved above are considered in tariff of the respective year:

**(c) Maintenance Spares:** The petitioner has calculated the value of maintenance spares for the purpose of working capital considering additional capital expenditure in the respective year after the date of commercial operation.

The amount claimed for maintenance spares for IWC calculation by the petitioner are as given below :

(Rs.in lakh).

Year	2004-05	2005-06	2006-07	2007-08	2008-09
<b>Amount claimed for maintenance spares</b>	1317	1396	1480	1568	1662

The historical cost as on the date of commercial operation, that is, 1.4.1997 is not made available on records. However, as per Government of India tariff notification, dated 5.5.1999, the capital cost available is Rs. 85912 lakh and the same has been adopted for the computation of maintenance spares.

(d) **Receivables:** The receivables have been worked out on the basis of two months of fixed and variable charges. The supporting calculations in respect of receivables are tabulated hereunder:

#### **Computation of receivables component of Working Capital**

	2004-05	2005-06	2006-07	2007-08	2008-09
<b>Variable Charges -2 months (Rs in lakh)</b>	<b>16437</b>	<b>16437</b>	<b>16437</b>	<b>16482</b>	<b>16437</b>
Fixed Charges - 2 months (Rs in lakh)	3242	3206	3171	3140	2659
<b>Receivables (Rs in lakh)</b>	<b>19679</b>	<b>19644</b>	<b>19608</b>	<b>19622</b>	<b>19096</b>

#### **Rate of interest on working capital**

42. The average SBI PLR of 10.25% as applicable on 1.4.2004 has been considered as the rate of interest on working capital during the tariff period 2004-05 to 2008-09.

43. The necessary details in support of calculation of Interest on Working Capital are appended below:

**Calculation of Interest on Working Capital**

(Rs. in lakh)

	2004-2005	2005-2006	2006-07	2007-2008	2008-09
Fuel Cost	8219	8219	8219	8241	8219
HSD Stock for ½ month	2376	2376	2376	2383	2376
O & M expenses	360	374	389	405	420
Spares	1292	1369	1451	1539	1631
Receivables	19679	19644	19608	19622	19096
<b>Total Working Capital</b>	<b>31926</b>	<b>31982</b>	<b>32043</b>	<b>32189</b>	<b>31742</b>
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
<b>Interest on Working capital</b>	<b>3272</b>	<b>3278</b>	<b>3284</b>	<b>3299</b>	<b>3254</b>

**ANNUAL FIXED CHARGES**

44. A summary sheet showing the details of capital cost, etc is annexed with this order. The annual fixed charges for the period 1.4.1999 to 31.3.2004 allowed in this order are summed up as below:

(Rs. in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	4328	4328	4328	4328	1494
Interest on Loan	1380	984	592	199	0
Return on Equity	6158	6158	6158	6158	6158
Advance against Depreciation	0	0	0	0	0
Interest on Working Capital	3272	3278	3284	3299	3254
O & M Expenses	4315	4489	4663	4854	5045
<b>TOTAL</b>	<b>19453</b>	<b>19238</b>	<b>19026</b>	<b>18839</b>	<b>15951</b>

**ENERGY/VARIABLE CHARGES**

45. The generating station is a combined cycle thermal power station designed for dual fuel firing, that is, natural gas and liquid fuel (HSD). The petitioner has claimed the energy charges based on the following operational norms as per the 2004 regulations-

Description	Unit	Combined Cycle Operation	Open Cycle Operation
Gross Station Heat Rate	kCal/kWh	2075	3010
Auxiliary Energy Consumption	%	3	1

46. The petitioner in its affidavit dated 16.2.2006 has submitted the auditors certificate regarding Price and GCV of fuels. The following table indicates the prices and GCV of the fuel furnished in the affidavit dated 16.2.2006 based on auditor's certificate and as adopted in the calculations for Base Energy Charges-

Description	Data furnished vide affidavit dated 16.2.2006	As adopted by the Commission
Gas price (Rs./1000 SCM)	3948.87	3951.29
Gas GCV (kcal/SCM)	9055.35	9055.35
HSD (Rs./kl)	20395.93	20313.83
GCV of HSD (Kcal/Lit)	9025.88	9025.88

The difference in prices of gas and HSD adopted by us is on account of taking weighted average price of Jan 2004 to March 2004 whereas prices considered by petitioner were based on simple average.

47. The Base Energy Charges in combined cycle operation computed based on the data adopted by us are summarized below:

Description	Unit	Combined Cycle
Rate of Energy Charge ex-bus per kWh sent (GAS)	Paise/ kWh	<b>93.343</b>
Rate of Energy Charge ex-bus per kWh sent (HSD)	Paise/ kWh	<b>481.447</b>

48. The Base Energy Charges have been calculated on base value of GCV, base price of fuel and normative operating parameters as indicated in the above table and

are subject to fuel price adjustment. The 2004 regulations provide for fuel price adjustment for variation in fuel price and GCV of fuels. Accordingly, the base energy charges approved shall be subject to adjustment. The formula applicable for fuel price adjustment shall be as given below: -

$$\text{FPA} = \frac{10 \times (\text{SHR}_n) \times (\text{P}_m/\text{K}_m) - (\text{P}_s/\text{K}_s)}{(100 - \text{AC}_n)}$$

Where,

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

**SHR<sub>n</sub>** = Normative Gross Station Heat Rate expressed in kCal/kWh

**AC<sub>n</sub>** = Normative Auxiliary Consumption in percentage

**P<sub>m</sub>** = 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<sub>m</sub>** = Weighted average gross calorific value of Gas or Liquid fuel for the month in Kcal/ SCM or kCal/ Litre or kCal/ Kg

**P<sub>s</sub>** = 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 determination of base energy charge in tariff order in Kcal/ SCM or kCal/ Litre or kCal/ Kg

49. FPA 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 3010 kCal/kWh and auxiliary energy consumption of 1%, as per formula given below:

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

**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<sub>no</sub>** - Normative Gross Station Heat Rate for Open cycle operation expressed in kCal/kWh (3010 kCal/kWh)

**SHR<sub>nc</sub>** - Normative Gross Station Heat Rate for Combined cycle operation expressed in kCal/kWh (2075 kCal/kWh)

**AC<sub>no</sub>** - Normative Auxiliary Consumption for Open cycle operation in percentage (1%)

AC<sub>nc</sub> - Normative Auxiliary Consumption for Combined cycle operation in percentage (3%)

POCM - Open cycle generation during the month in percentage

50. 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 operation.

**Impact of additional capitalization for the years 2001-04**

51. In petition No 174/2004 filed by the petitioner for approval of revised fixed charges for additional capitalization for the period 1.4.2001 to 31.3.2004, the Commission has decided that additional capital expenditure be added to the gross block as on 1.4.2001 to arrive at gross block as on 1.4.2004 for the purpose of fixation of tariff for the period 2004-05 to 2008-09. The Commission has further ordered that the petitioner would be entitled to earn return on equity @ 16% on equity portion of additional capitalization approved and interest on loan at the rate as applicable during 2001-02 to 2003-04. The return on equity and interest on loan are payable on additional capitalization from 1<sup>st</sup> April of the financial year following the financial year to which additional capital expenditure relates.

52. Based on the above, the petitioner shall be entitled to recover the following amounts from the respondents through tariff on account of return on equity on additional equity on account of additional capitalisation on works.:

(Rs. in lakh)

		2001-02	2002-03	2003-04
1	Additional Capitalisation during the year vide order 13.4.2005	363.786	602.648	375.049
2	Considered for impact from 1 <sup>st</sup> April of financial year following the financial to which ACE relates	0	363.786	966.434
3	Equity 50% as considered in tariff	0	181.893	483.217
4	Loan	0	181.893	483.217
5	Actual rate of interest as worked after refinancing of loans		10.22%	9.13%
6	Return on equity allowed in order dated 6.11.2003	16%	16%	16%
	<b>IMPACT</b>			
	Interest on loan	0	18.59	44.12
	Return on Equity	0	29.10	77.31
	Total		47.69	121.43
	Total amount due during the years 2001-02 to 2003-04 (payable by the beneficiaries)			<b>169.12</b>

53. The petitioner has vide its affidavit dated 9.3.2006, sought approval for the reimbursement of expenditure of Rs. 334678/- incurred on publication of notices in the newspapers. The petitioner shall claim reimbursement of the said expenditure directly from the respondents in one installment in the ratio applicable for sharing of fixed charges. The petitioner has also sought reimbursement of filing fee of Rs.25 lakh paid. A final view on reimbursement of filing fee is yet to be taken by the Commission for which views of the stakeholder have been called for. The view taken on consideration of the comments received shall apply in the present case as regards reimbursement of filing fee.

54. In addition to the charges approved above, the petitioner is entitled to recover other charges also like incentive, claim for reimbursement of Income-tax, other taxes, cess levied by a statutory authority, and other charges in accordance with the 2004 regulations, as applicable.



55. The petitioner is already billing the respondents on provisional basis in accordance with the Commission's interim directions. The provisional billing of tariff shall be adjusted in the light of final tariff now approved by us.

56. This order disposes of Petition No 155/2004 and IA. 42/2005.

**Sd/-**  
**(A.H. JUNG)**  
**MEMBER**

**Sd/-**  
**(BHANU BHUSHAN)**  
**MEMBER**

**Sd/-**  
**(K.N. SINHA)**  
**MEMBER**

**Sd/-**  
**(ASHOK BASU)**  
**CHAIRPERSON**

**New Delhi dated the 9<sup>th</sup> May 2006**

Summary Sheet							
Name of the Company		NTPC Ltd.					
Name of the Station		DADRI GPS (829.78 MW)					
Tariff setting Period		2004-09					
Petition No.		155/2004					
						Rs. In lakh	
1	Capital Cost of the Project as on 31.3.2001					86633	
3	Additional Capitalisation(works)					1341	
		2001-02			364		
		2002-03			603		
		2003-04			374		
		Total			1341		
4	Additional Capitalisation(FERV)					0	
		2001-02			0.00		
		2002-03			0.00		
		2003-04			0.00		
		Total			0.00		
5	Total Capital Cost as on 1.4.2004(1+3+4)					87974	
6	Means of Finance <sup>1</sup> :						
		Debt	50.00%		43987.00		
		Equity	50.00%		43987.00		
		Total	100.00%		87974.00		
7	Debt details-Notional Debt (Net) as on 01.04.2004 Notional debt (Net) as on 1.4.2004					43987	
		Notional Debt(Gross i.e.50% of 171622 )			43987.00		
		Repayment upto 31.3.2004			26712.00		
		Balance Debt			17275.00		
8	Weighted Av. Rate of interest- Calculated						
		2004-05	2005-06	2006-07	2007-08	2008-09	
		9.13%	9.13%	9.16%	9.26%	9.32%	
9	Depreciation recovered upto 31.3.2009 :					75826	
				Dep	AAD	Total	
		Recovered upto 31.3.2001			42624	0.00	42624
		1.4.2001 to 31.4.2004			14395	0.00	14395
		1.4.2004 to 31.3.2009			18807	0.00	18807
		ERV Impact From 2001-04			0	0.00	0
		Total			75826		
#	Balance Depreciation to be recovered beyond 31.3.2009 :						
		Capital cost for the purpose of Depreciation <sup>2</sup>			86633		
		ACE + FERV			1341		
		Capital cost as 1.4.2004			87974		
		Less: Land Cost			69		
					87905		
		90% of Capital Cost as above			79115		
		Cum. Depreciation to be recovered upto 31.3.2009			75826		
		Balance			3289		
						3289	