

**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 156/2004**

**In the matter of**

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

**And in the matter of**

National Thermal Power Corporation Ltd.

.....**Petition**

**Vs**

Haryana Vidyut Prasaran Nigam Ltd., Panchkula

.....**Respondent**

**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. Sardana, NTPC
8. Shri Gaurav Maheswari, NTPC
9. Shri R. Singhal, NTPC
10. Shri S.M. Samui, NTPC
11. Shri Balaji Dubey, NTPC
12. Shri R.K. Arora, XEN(T), 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 Faridabad 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 431.6 MW generating station comprises of two gas turbine (GT) units with capacity of 140.827 MW each and one steam turbine (ST) unit with capacity of 149.932 MW. The date of commercial operation of GT-I, GT-II and ST, are 1.9.1999, 1.1.2000 and 1.1.2001 respectively. Thus, the date of commercial operation of the generating station is 1.1.2001.

3. The tariff for the generating station for the period ending 31.3.2004 was approved by the Commission vide its order dated 30.6.2003 in Petition No 81/2002 based on capital cost of Rs. 90290 lakh as on 31.3.2001. In the petition, the petitioner had claimed additional capitalisation on works for the years 2001-02, 2002-03 and 2003-04 based on budgetary projections. This additional capitalisation claimed by the petitioner was not considered in the order dated 30.6.2003 for tariff determination. Subsequently, vide order dated 7.4.2005 in Petition No 161/2004, the Commission approved the additional capital expenditure of Rs. 3801.103 lakh against the petitioner’s claim of additional capitalisation of Rs.4182.579 lakh for the period 1.4.2001 to 31.3.2004 and arrived at the capital base of Rs. 94091 lakh as on 31.3.2004, for the purpose determination of tariff as on 1.4.2004. The Commission further ordered that the cost of servicing of investment on the additional expenditure would be reimbursed to the petitioner during tariff for 2004-09. The details of the capital expenditure approved are given hereunder:

(Rs. in lakh)	
2001-2002	1449.092
2002-2003	1718.168
2003-2004	633.843
<b>Total</b>	<b>3801.103</b>

4. Consequent to approval of the additional capital expenditure by order dated 7.4.2005, the petitioner filed the amended petition to claim tariff for the period 2004-05 to 2008-09. This order is in the context of the amended petition subsequently filed.

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

(Rs. in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	4355	4355	4355	4355	4355
Interest on Loan	5439	4792	4069	3497	3021
Return on Equity	6613	6613	6613	6613	6613
Advance against Depreciation	0	0	0	0	0
Interest on Working Capital	1738	1738	1737	1742	1743
O & M Expenses	3366	3500	3643	3785	3936
<b>TOTAL</b>	<b>21512</b>	<b>20998</b>	<b>20417</b>	<b>19992</b>	<b>19668</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)

	2004-05	2005-06	2006-07	2007-08	2008-09
Spares	1187	1258	1334	1414	1499
O & M expenses	281	292	304	315	328
Receivables	8560	8475	8378	8321	8253
Stock of Liquid Fuel	4439	4439	4439	4451	4439
Total Working Capital	16954	16951	16942	16995	17006
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
<b>Total Interest on Working capital</b>	<b>1738</b>	<b>1738</b>	<b>1737</b>	<b>1742</b>	<b>1743</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	87.99	121.01
Rate of Energy Charge ex-bus per kWh sent (NAPTHA)	Paise/ kWh	363.12	515.89

8. The reply to the petition before amendment was filed by the respondent. 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 has considered the capital expenditure of Rs. 940.91 lakh after accounting for additional capitalization of Rs. 3801 lakh on works already approved over the capital expenditure of Rs. 90290 lakh admitted by the Commission in the

order dated 30.6.2003 *ibid*. The petitioner has not claimed FERV in the present petition.

12. The petitioner, vide affidavit filed on 16.2.2005 has confirmed that all the assets included in the balance sheet for 2003-04 of the generating station were in use as on 1.4.2004. The petitioner has further submitted that the assets that will be out of use in the tariff period 2004-09 will be decapitalised and the details of such assets not in use/amounts decapitalized shall be furnished to the Commission along with the claims of capitalisation to be filed separately.

13. The Commission vide its order dated 7.4.2005 in Petition No.161/2004 has decided that the opening capital cost for the purpose of tariff for the period 2004-09 as on 1.4.2004 shall be Rs.94091 lakh. This has been adopted for the purpose of tariff determination in the present petition.

#### **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, vide its order dated 30.6.2003 in Petition No 81/2002 while approving tariff for the period from 1.4.2001 to 31.3.2004 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 apportioned between debt and equity in the ratio of

50:50. Accordingly, for the purpose of tariff, an amount of Rs. 47045 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. 47045 lakh after accounting for equity on account of additional capitalization on works for the period 1.4.2001 to 31.3.2004, which 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 shall be Rs 6586 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 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 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. The interest on loan has been worked out in the manner given hereunder:

(a) The normative loan outstanding as per the order dated 30.6.2003 Rs.44233 lakh has been considered.

(b) Notional loan of Rs.1901 lakh arising due to additional capitalization for the period 2001-04 has been accounted for, aggregating the total outstanding notional loan as on 1.4.2004 to Rs.46133 lakh.

(c) Normative repayment of loan or depreciation whichever is higher has been treated as repayment during the year.

(d) Normative repayment has been worked out as under:

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

(e) The petitioner has considered FIFO method of repayment for some of the loans viz. SBI-I, SB Indore, Bank of Maharashtra-I, SB Of Patiala, Bank of Punjab and Indian Bank. However, in our calculations, actual repayment of loan is worked out on average basis as was followed in earlier tariff order of the generating station, since adoption of FIFO method

may result in higher AAD in the existing generating stations and higher IDC in new generating stations.

- (f) The petitioner has not considered cumulative repayment of loan as per earlier order dated 30.6.2003 and shown it as NIL. Cumulative repayment as per earlier order dated 30.6.2003 is Rs.912 lakh, which has been considered for calculation of interest on loan during tariff period 2004-09.
- (g) The petitioner has calculated interest on loan considering weighted average rate of interest (including financing charges) on monthly rest basis. In our calculations, interest on loan has been calculated by taking interest on annual rest basis (including financial charges as claimed by the petitioner).
- (h) The petitioner had refinanced 14.5% GOI loan with 9.55% Bond (Series XIII A) on 18.4.2002. The petitioner has calculated IOL considering GOI loan. However in calculations Bond XIII A has been considered instead of GOI loan, since it was found to be beneficial in the long run to the beneficiaries, based on NPV analysis carried out.
- (i) The weighted average rate of interest considered for calculating the interest on loan is that of Bonds XIV which is outstanding in the books of accounts of the petitioner. These Bonds have replaced the high interest bearing GOI loans considered in earlier tariff period.
- (j) Financial charges incurred towards loan/s by the petitioner have been allowed and taken into consideration for calculation for interest on loan. In this case the financial charges considered are 0.05% in case of SBI-I, SBI-II, SB Indore, 0.06% in case of Bank of Maharashtra-I and 0.03 % Surveillance fees for Bond Series XIII A.
- (k) Some of the loans interest viz. SBI-I and SBI-II (rate being 9.6%) carry floating rate of. Therefore, interest rate prevailing as on 1.4.2004 has been considered for interest computations. However, interest on loan would be



subject to adjustment on the basis of actual rate of interest applicable during the tariff period.

21. The computations of interest on notional loan by applying weighted average interest rate are appended hereinbelow:

#### **COMPUTATION OF INTEREST ON LOAN**

(Rs. in lakh)

	2004-05	2005-06	2006-07	2007-08	2008-09
Gross loan-Opening	47045	47045	47045	47045	47045
Cumulative repayments of Loans up to previous year	912	4696	8480	12263	16047
Net loan-Opening	46133	42350	38566	34782	30998
Repayments of Loans during the year	3784	3784	3784	3784	4790
Net loan-Closing	42350	38566	34782	30998	26208
Average Net Loan	44241	40458	36674	32890	28603
Rate of Interest on Loan	8.9264%	9.0017%	9.0865%	9.1832%	9.2816%
Interest on loan	3949	3642	3332	3020	2655

#### **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. In present petition the petitioner has decapitalised assets worth Rs. 381.49 lakh for the period up to 31.3.2004 and has claimed depreciation after accounting for depreciation of Rs. 82.12 lakh recovered against the assets decapitalised. The same is considered.

24. The cost of land in the present case is Rs. 8377 lakh. The gross depreciable value of the asset, excluding land cost, is  $0.9 \times (\text{Rs. } 94091 \text{ lakh} - \text{Rs. } 8377 \text{ lakh}) = \text{Rs. } 77142 \text{ lakh}$ . Cumulative depreciation and AAD recovered in tariff up to 31.3.2004 is Rs.15651 lakh. Remaining depreciable value as on 1.4.2004 is thus Rs.61573 lakh.

25. Since the normative loan is outstanding depreciation is calculated as per weighted average rate of depreciation. Weighted average rate of depreciation calculated based on Gross value of asset is 4.02 %. The petitioner had considered depreciation rate of 25% for assets not owned by it amounting to Rs. 198.42 lakh. However, rate of depreciation of these assets, as per details furnished by the petitioner, was worked out as per rates applicable to individual assets included in Appendix-II to the 2004 regulations. For assets not listed specifically in Appendix-II the rates considered are as applicable to similar assets included in Appendix-II.

26. The petitioner has de-capitalised assets valued at Rs. 768 lakh during the period 2001-04. These de-capitalised assets were removed from the gross block to arrive at admissible additional capitalization for the purpose of capital cost in the order

dated 7.4.2005. The petitioner is maintaining accounts on accrual basis. This resulted in inflated capital base in earlier tariff periods due to capitalization of liability provision. The expenditure for which provision was made did not materialise and it was de-capitalised subsequently. But the petitioner has been allowed tariff on the inflated capital base till 31.3.2004. However the past period calculations towards impact on tariff have not been opened and may be mutually settled between the petitioner and the beneficiary.

27. In case of de-capitalization of physical assets, depreciation recovered up to the date of de-capitalization has been reduced from cumulative depreciation recovered till 31.3.2004 based on the information submitted by the petitioner. The petitioner has considered de-capitalisation of assets to the tune of Rs.381.49 lakh and calculated depreciation charged on the assets till de-capitalisation amounting to Rs. 82.12 lakh. As per claims made by the petitioner the amount of cumulative depreciation calculated has been considered. Accordingly, the depreciation recovered in tariff up to 31.3.2004 has been taken as per the order dated 30.6.2003 *ibid*, with limited correction on account of de-capitalization of assets by the petitioner as stated above.

28. Based on the above, for the period 1.4.2004 to 31.3.2009 the depreciation works out to Rs. 3784 lakh each year 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 1.4.2004	94091	94091	94091	94091	94091	94091
Depreciable Value	77142	77142	77142	77142	77142	77142
Balance Useful life of the asset	-	-	-	-	-	-
Remaining Depreciable Value	61573	57789	54005	50221	46437	
<b>Depreciation</b>		<b>3784</b>	<b>3784</b>	<b>3784</b>	<b>3784</b>	<b>3784</b>

## **ADVANCE AGAINST DEPRECIATION**

29. 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

30. 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.

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

## **O&M EXPENSES**

32. Under the 2004 regulations, O&M norms specified for Combined Cycle generating stations, other than small gas turbine power generating station without warranty spares are -

(Rs. in lakh /MW)

Year	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses/ MW	7.80	8.11	8.44	8.77	9.12

33. The petitioner has claimed O&M expenses are as detailed below, stated to have been worked out based on actual expenses for the preceding 5 years:

Years	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses (Rs in. lakh)	<b>3366</b>	<b>3500</b>	<b>3643</b>	<b>3785</b>	<b>3936</b>

34. 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.

35. 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.

36. 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>3366</b>	<b>3500</b>	<b>3643</b>	<b>3785</b>	<b>3936</b>

37. 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**

38. 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.

39. 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.

40. 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 (Naphtha) for preceding three months from January 2004 to March 2004, stated to be based on actual operating pattern for 2003-04, that is, (95% on Gas and 5% on Liquid Fuel):

Particulars	2004-05	2005-06	2006-07	(Rs. in lakh)	
				2007-08 (Leap Year)	2008-09
<b>Fuel Cost for 1 Month</b>	2488	2488	2488	2494	2488
<b>Liquid fuel stock for 1/2 month</b>	4439	4439	4439	4451	4439

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 95% availability of the generating station was declared on gas and the remaining 5% 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 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. The fuel stock has been worked out for two months on the basis of operational parameters given in the 2004 regulations. Based on the weighted average GCV and price of fuels the fuel component in working capital works out as follows for different years during tariff period

Description	(Rs in lakh)	
	1.4.2004 to 31.3.2007 and 1.4.2008 to 31.3.2009	1.4. 2007 to 31.3.2008 (Leap Year)
Value of stock of Naphtha for 1/2 month	216	217
Fuel Cost-1 Month	2475	2482
Energy Charges for Two months	4951	4964

**(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 respective years after the date of commercial operation. The amount claimed for maintenance spares for working capital calculation by the petitioner are as given below :

Year	(Rs.in lakh).				
	2004-05	2005-06	2006-07	2007-08	2008-09
<b>Amount claimed for maintenance spares</b>	1187	1258	1334	1414	1499

Accordingly, the spare requirement has been worked out on historical cost as on the date of commercial operation, without considering the additional



capitalisation thereafter. 1% of the historical cost of Rs. 90290 lakh as on 31.3.2001 (the date of commercial operation of the generating station is 1.1.2001) , after adjusting the amount of over-capitalization prior to the date of commercial operation and deducting initial spares amount, has been escalated at the rate of 6% p.a. to arrive at permissible spare consumption for the relevant years.

(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**

	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Variable Charges					
Rs./kWh	1.012	1.012	1.012	1.012	1.012
Variable Charges per year (Rs.)	29704	29704	29704	29786	29704
<b>Variable Charges -2 months (Rs in lakh)</b>	4951	4951	4951	4964	4951
Fixed Charges - 2 months (Rs in lakh)	3155	3127	3100	3073	3038
<b>Receivables (Rs in lakh)</b>	8105	8077	8050	8037	7988

41. 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.

42. 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	2475	2475	2475	2482	2475
Naphtha stock	216	216	216	217	216
O & M expenses	281	292	304	315	328
Spares	1049	1112	1178	1249	1324
Receivables- 2 months	8105	8077	8050	8037	7988
<b>Total Working Capital</b>	12126	12172	12224	12300	12332
Interest Rate-SBI PLR	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on Working Capital	1243	1248	1253	1261	1264

### ANNUAL FIXED CHARGES

43. 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
<b>Depreciation</b>	3784	3784	3784	3784	3784
<b>Interest on Loan</b>	3949	3642	3332	3020	2655
<b>Return on Equity</b>	6586	6586	6586	6586	6586
<b>Advance against Depreciation</b>	0	0	0	0	0
<b>Interest on Working Capital</b>	1243	1248	1253	1261	1264
<b>O&amp;M Expenses</b>	3366	3500	3643	3785	3936
<b>Total</b>	<b>18928</b>	<b>18760</b>	<b>18598</b>	<b>18436</b>	<b>18225</b>

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

Description	Unit	
Auxiliary Energy Consumption in Combined Cycle mode	%	3
Auxiliary Energy Consumption in Open Cycle mode	%	1
Station Heat Rate in Combined Cycle mode	kCal/kWh	2000
Station Heat Rate in Open Cycle mode	kCal/kWh	2900

45. The petitioner in its affidavit dated 14.2.2006 has submitted that there is a change in the weighted average GCV of gas due to typographical error. The petitioner has explained that Naphtha is purchased in metric ton. Accordingly PSL is maintained in MT. Average Calorific value in Kilo litres (KL) was calculated by converting MT to

KL based on density. In the original petition it had taken conversion factor as 0.7 (0.7 MT per Kl) by averaging issue of naphtha for all the 3 months. However, the conversion factor is now being taken as monthly average of purchases for each month. Month-wise factor now taken is as given below:

January 2004	0.6847 MT/KL
February 2004	0.7054 MT/KL
March 2004	0.7172 MT/KL
Average	0.70243 or 0.7

46. In our computation we have taken a conversion factor of 0.7 for converting kl to MT and vice-versa.

47. The petitioner has procured two types of liquid fuels i.e Naphtha and HSD. during the period January 2004 to March 2004 and has calculated the weighted average price of liquid fuel on procurement basis. It is observed that the price of HSD is significantly higher by Rs.8000/kL in comparison to Naphtha. As such, the weighted average price of the fuel-mix gets increased significantly if HSD is procured in more quantity. Real time consumption of HSD is very less in comparison to Naphtha and calculating the weighted average price on procurement basis will lead to inflated liquid fuel oil price. As such, the base energy charges are being calculated on the weighted average prices and GCV of Naphtha only. The energy charge so calculated shall be subject to fuel price adjustment for variation in GCV and prices of fuels on month to month basis and will automatically cover the cost of HSD as and when consumed in the ratio of actual consumption of HSD and naphtha. The energy charges have been calculated on the basis of information furnished in respect of Fuel for GCV and prices certified by auditors and submitted vide affidavit dated 14.2.2006.

48. The petitioner in its affidavit dated 14.2.2006 has submitted the auditors certificate regarding Price and GCV of fuels. The following table contains the prices and GCV of the fuel as certified by the auditors and those adopted in our calculations for base energy charges-

Description	Data furnished vide affidavit dated 14.2.2006	As considered
Gas price (Rs./1000 SCM)	3876.82	3876.82
Gas GCV (kcal/SCM)	9088.13	9088.13
Liquid fuel (Naphtha/HSD) price (Rs./KL)	14203.47 (Naphtha/HSD)	13787.83 (Naphtha)
GCV of Naphtha (Kcal/L)	8034.49	8034.49

49. The Base Energy Charges have been calculated as under based on the operational norms specified in the 2004 regulations and price and GCV of gas and Naphtha considered:

	Unit	For the period from 1.4.2004 to 31.3.2009 except year 2007-08	Leap Year 2007-08
Capacity	MW	431.586	431.586
Normative PLF/Availability	Hours/Kw/year	7008.00	7027.20
Gross Station Heat Rate corresponding to GCV	kCal/kWh	2000.00	2000.00
Aux. Energy Consumption	%	3.00	3.00
Weighted average GCV of Gas	kCal/SCM	9088.13	9088.13
Weighted average Price of Gas	Rs./1000SCM	3876.82	3876.82
Weighted average GCV of Naptha	kCal/litre	8034.49	8034.49
Weighted average Price of Naptha	Rs./KL	13787.83	13787.83
Rate of Energy Charge ex-bus per kWh Sent on Gas	Paise/kWh	87.955	87.955
Rate of Energy Charge ex-bus per kWh Sent on Naptha	Paise/kWh	<b>353.831</b>	<b>353.831</b>

50. 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: -

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

Where,

- FPA** = Fuel price Adjustment for a month in Paise/kWh Sent out
- SHR<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<sub>s</sub>** = 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

51. 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 2900 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<sub>no</sub> - Normative Gross Station Heat Rate for Open cycle operation expressed in kCal/kWh (2900 kCal/kWh)
- SHR<sub>nc</sub> - Normative Gross Station Heat Rate for Combined cycle operation expressed in kCal/kWh (2000 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

52. 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**

53. In petition No 161/2004 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.

54. 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 and interest on loan on additional capitalisation on works.:

(Rs. in lakh)				
	2001-02	2002-03	2003-04	Total
<b>Additional Capitalisation</b>	<b>1449.09</b>	<b>1718.17</b>	<b>633.84</b>	<b>3801.10</b>
<b>Financing of Additional Capitalisation</b>				
Notional Loan	724.55	859.08	316.92	1900.55
Notional Equity	724.55	859.08	316.92	1900.55
<b>Total</b>				
<b>Effective Additional Capitalisation</b>				
Opening Loan Balance	0.00	724.55	1583.63	
Addition of Loan	724.55	859.08	316.92	<b>1900.55</b>
Repayment of Loan	0.00	0.00	0.00	<b>0.00</b>
Closing Loan Balance	724.55	1583.63	1900.55	
Effective Loan		724.55	1583.63	
Weighted Average Rate of Interest on Loan		10.6916%	10.5247%	
Effective Equity		724.55	1583.63	
Interest on Loan		77.47	166.67	<b>244.14</b>
Return on Equity	16%	115.93	253.38	<b>369.31</b>
<b>Impact of Additional Capitalisation</b>		193.39	420.05	<b>613.45</b>

55. The petitioner has sought approval for the reimbursement of expenditure of Rs. 263917/- 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.

56. 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.

57. 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.

58. This order disposes of Petition No 156/2004.

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				
<b>Company:</b>			NTPC Ltd.	
<b>Power Station:</b>			Faridabad GPS	
<b>Petition No.</b>			156/2004	
<b>Tariff Setting Period</b>			2004-09	
(Rs. in lakh)				
<b>1</b>	<b>Capital Cost of the Project as on 31.03.2001</b>			<b>90290</b>
<b>2</b>	<b>Additional Capitalisation(works)</b>			<b>3801</b>
	2001-02		1449	
	2002-03		1718	
	2003-04		634	
	Total		3801	
<b>3</b>	<b>Additional Capitalisation(FERV)</b>			<b>0</b>
	2001-02		0	
	2002-03		0	
	2003-04		0	
	Total		0	
<b>4</b>	<b>Total Capital Cost as on 1.4.2004(1+2+3)</b>			<b>94091</b>
<b>5</b>	<b>Means of Finance<sup>1</sup> :</b>			
	Debt	50.00%	47045	
	Equity	50.00%	47045	
	Total	100.00%	94091	
<b>6</b>	<b>Normative Loan as on 1.4.2004</b>			<b>46133</b>
	Normative Loan O/S as on 31.3.2004		44233	
	Normative Loan due to ACE+FERV in 2001-04		1901	
	Total Normative Loan as on 1.4.2004		46133	
<b>7</b>	<b>Cumulative Repayment up to 31.3.2009 :</b>			<b>20837</b>
	Repaid up to 31.3.2004		912	
	1.4.01 to 31.3.2004 (ACE & FERV)		0	
	1.4.2004 to 31.3.2009		19926	
	Total		20837	
<b>8</b>	<b>Balance Normative Loan to be repaid beyond 31.3.2009 :</b>			<b>26208</b>
<b>9</b>	<b>Depreciation recovered up to 31.3.2009 :</b>			<b>34488</b>
		<b>Dep</b>	<b>AAD</b>	<b>Total</b>
	Recovered up to 31.3.2004	15651	0	15651
	1.4.2001 to 31.3.2004 (ACE & FERV)	0	0	0
	1.4.2004 to 31.3.2009	18919	0	18919
	Adjustment of Cumulative Depreciation due to de-capitalisation	(-)82	0	(-)82
	Total			34488
<b>10</b>	<b>Balance Depreciation to be recovered beyond 31.3.2009 :</b>			<b>42654</b>
	<b>Capital cost for the purpose of Depreciation</b>			<b>90290</b>
	<b>ACE + FERV</b>			<b>3801</b>
	<b>Capital cost as 1.4.2004</b>			<b>94091</b>
	<b>Less: Land Cost</b>			<b>8377</b>
				<b>85713</b>
	<b>90% of Capital Cost as above</b>			<b>77142</b>
	<b>Cum. Depreciation to be recovered up to 31.3.2009</b>			<b>34488</b>
	<b>Balance Depreciation to be recovered beyond 31.3.2009</b>			<b>42654</b>