

**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 142/2004**

**In the matter of**

Approval of tariff in respect of Feroze Gandhi Unchahar Thermal Power Station Stage I 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 Feroze Gandhi Unchahar Thermal Power Station Stage I (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 420 MW was taken over by the petitioner on 13.2.1992.

3. The tariff for the generating station for the period ending 31.3.2004 was approved by the Commission vide its order dated 24.10.2003 in Petition No 41/2001 based on capital cost of Rs. 94070 lakh as on 31.3.2001 and included FERV up to that date. 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 24.10.2003 for tariff determination. Subsequently, vide order dated 31.3.2005 in Petition No 139/2004, the Commission approved the additional capital expenditure of Rs. 452.10 lakh against the petitioner's claim of Rs. 610.00 lakh for the period 1.4.2001 to 31.3.2004, excluding FERV and arrived at the capital base of Rs.

94522.10 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	8.6
2002-2003	446.7
2003-2004	(-) 3.2
<b>Total</b>	<b>452.1</b>

4. Consequent to approval of the additional capital expenditure by order dated 31.3.2005, 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)					
<b>Particulars</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Interest on Loan	85	77	68	59	51
Interest on Working Capital	1555	1572	1590	1612	1629
Depreciation	3347	3347	3347	3347	3347
Advance against Depreciation	0	0	0	0	0
Return on Equity	6618	6618	6618	6618	6618
O & M Expenses	4368	4544	4725	4914	5111
<b>TOTAL</b>	<b>15973</b>	<b>16158</b>	<b>16348</b>	<b>16550</b>	<b>16756</b>

6. The details of 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>
Coal Stock	4942	4942	4942	4955	4942
Oil stock	133.54	133.54	133.54	133.9	133.54
O & M expenses	364	378.7	393.75	409.5	425.95
Spares	1995	2115	2242	2376	2519
Receivables	7737	7768.2	7799.8	7847.3	7867.8
Total Working Capital	15172	15337	15511	15722	15888
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
<b>Interest on Working capital</b>	<b>1555</b>	<b>1572</b>	<b>1590</b>	<b>1611</b>	<b>1629</b>

7. In addition, the petitioner has claimed energy charges. The petitioner initially claimed energy charges @ 106.96 paise/kWh. Later on, based on escalated coal price with effect from 15.6.2004 the petitioner claimed energy charges @ 113.69 paise/kWh. The energy charges claimed are subject to adjustment for fuel price.

8. The reply to the petition was filed by UPPCL, JVVNL, AVVN and PSEB. The other respondents have not filed their 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. A general issue regarding treatment of depreciation when it exceeds repayment of loan in a year has been considered by the Commission in its order dated 5.5.2006 in Petition No 162/2004. The Commission 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. The above decision has been followed in the present case. A 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.

### **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. 94543 lakh after accounting for additional capitalization of Rs. 452.1 lakh approved for the period 2001-04 and Rs. 21.00 lakh on account of FERV for the period 1.4.2001 to 31.3.2004 over the capital expenditure of Rs. 94070 lakh admitted by the Commission in the order dated 24.10.2003 *ibid*. The details of FERV claimed by the petitioner are as follows:

(Rs. In lakh)				
Year	2001-02	2002-03	2003-04	Total
FERV	3	16	2	21

12. The petitioner, vide affidavit filed on 16.11.2005 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 de-capitalised and the details of such assets not in use/amounts de-capitalized shall be furnished to the Commission along with the claims of capitalisation to be filed separately.

13. The Commission vide its order dated 31.3.2005 in Petition No.180/2004 has decided that the opening capital cost (excluding FERV) for the purpose of tariff for the period 2004-09 as on 1.4.2004 shall be Rs.94522.10 lakh. This has been adopted for the purpose of tariff determination in the present petition. Now we consider the question of additional capitalisation on account of FERV.

**FERV/Extra Rupee Liability during the years 2001-04**

14. Regulation 1.13 (a) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2001 provided as under:

- (a) Extra rupee liability towards interest payment and loan repayment actually incurred, in the relevant year shall be admissible; provided it directly arises out of foreign exchange rate variation and is not attributable to Utility or its suppliers or contractors. Every utility shall follow the method as per the Accounting Standard-11 (Eleven) as issued by the Institute of Chartered Accountants of India to calculate the impact of exchange rate variation on loan repayment
- (b) Any foreign exchange rate variation to the extent of the dividend paid out on the permissible equity contributed in foreign currency, subject to the ceiling of permissible return shall be admissible. This as and when paid, may be spread over the twelve-month period in arrears

15. Regulation 1.7 of the 2001 regulations further provided that recovery of foreign exchange rate variation would be done directly by the utilities from the beneficiaries without filing a petition before the Commission. In case of any objections by the beneficiaries to the amounts claimed on these counts, they may file an appropriate petition before the Commission.

16. The petitioner's claim for capitalization of Rs.21 lakh on account of FERV, is matching with calculations submitted and is in accordance with AS-11 applicable up to 31.3.2004. The respondents have not objected to the petitioner's claim under this head. The claim has accordingly been admitted for tariff calculations.

17. Based on the above, after adjustment of FERV of Rs 21 lakh, the gross block as on 1.4.2004 comes to Rs.94543 lakh as per details given hereunder:

(Rs. in lakh)

Capital cost admitted as on 31.3.2001.	94070
Additional Capitalization as approved for the years 2001-2004	452
FERV admitted for the tariff period 2001-2004	21
Opening Capital cost as on 1.4.2004 for the tariff period 2004-2009	94543

### **DEBT-EQUITY RATIO**

18. 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.

19. The Commission, while approving tariff vide its order dated 24.10.2003 in Petition No 41/2001 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. Accordingly, an amount of Rs. 47272 lakh has been considered as equity as on 1.4.2004.

### **TARGET AVAILABILITY**

20. 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**

21. 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.

22. The petitioner has claimed return on equity of Rs.47272 lakh after accounting for equity on account of additional capitalization on works and FERV for the period 1.4.2001 to 31.3.2004. This claim has been accepted. The return on equity payable by the respondents shall, therefore, be Rs.6618 lakh per annum.

### **INTEREST ON LOAN**

23. 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.

24. The fixed charges for the period prior to 1.4.2004 were allowed by the Commission on normative loan. Therefore, the interest on loan has been worked out as under in accordance with the methodology specified by the Commission:

(a) The gross opening normative loan amount has been taken as per the Commission' order dated 24.10.2003 in petition no. 41/2001, to which additional capitalization on account of works and FERV for the period 2001-04 have been added.

(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.41/2001.

(c) The annual repayment amount for the years 2004-05 to 2008-09 has 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 re-payment of the year is less than the depreciation of the same year, the re-payment has been considered to the extent of depreciation, as decided above.
- (e) The weighted average rate of interest has been worked taking into account the rate of interest on loans applicable to the loans identified to this project and the same has been applied on the normative average loan during the year to arrive at the interest on loan.
- (f) The loan draws up to 31.3.2004 only have been considered.

25. The necessary calculations in support of weighted average rate of interest are appended below:

#### **CALCULATIONS OF WEIGHTED AVERAGE RATE OF INTEREST**

(Rs. in lakh)

	2004-05	2005-06	2006-07	2007-08	2008-09
<b>IBRD-O (USD-EQ)-INR</b>					
Opening Balance	167.43	155	142.59	128.74	113.84
Addition/Drawl	0	0	0	0	0
Repayment	12	13	13.85	14.90	16.02
Closing Balance	155.46	143	128.74	113.84	97.82
Average Loan-INR	161.45	149	136	121	106
Rate of Interest	5.85%	5.85%	5.85%	5.85%	5.85%
Interest-INR	9	9	8	7.10	6.19
<b>IBRD-A (USD)-INR</b>					
Opening Balance	9	7	5	2.28	0
Addition/Drawl	0	0	0	0	0
Repayment	2	2	2	2.28	0
Closing Balance	7	5	2	0	0
Average Loan-INR	8	6	3	1	0
Rate of Interest	6.64%	6.64%	6.64%	6.64%	6.64%
Interest-INR	0.53	0.38	0.23	0.08	0
<b>IBRD-B (EURO)-INR</b>					

Opening Balance	10.44	7.85	5	3	0
Addition/Drawl	0	0	0	0	0
Repayment	2.59	3	3	3	0
Closing Balance	7.85	5	3	0	0
Average Loan-INR	9.15	7	4	1	0
Rate of Interest	5.20%	5.20%	5.20%	5.20%	5.20%
Interest-INR	0.48	0.34	0.21	0.07	0.00
<b>TOTAL LOAN</b>					
Opening Balance	187.02	170.17	152.42	133.69	113.92
Addition/Drawl	0.00	0.00	0.00	0.00	0.00
Repayment	16.85	17.75	18.73	19.77	16.10
Closing Balance	170.17	152.42	133.69	113.92	97.82
Average Loan	178.60	161.30	143.06	123.81	105.87
Rate of Interest	5.85	5.85	5.85	5.85	5.85
Interest	10.45	9.44	8.37	7.24	6.19

26. 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	2009-04
Gross loan-Opening	47272	47272	47272	47272	47272
Cumulative repayments of Loans up to previous year	46869	47272	47272	47272	47272
Net loan-Opening	402	0	0	0	0
Increase/ Decrease due to FERV	0	0	0	0	0
Increase/ Decrease due to Additional Capitalisation	0	0	0	0	0
Total	402	0	0	0	0
Repayments of Loans during the year	402	0	0	0	0
Net loan-Closing	0	0	0	0	0
Average Net Loan	201	0	0	0	0
Rate of Interest on Loan	5.85%	5.85%	5.85%	5.85%	5.85%
<b>Interest on loan</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## **DEPRECIATION**

27. 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.

28. The petitioner has calculated the weighted average depreciation rate of 3.54% (excluding free hold land) based on the depreciation rates specified in Appendix II) to the 2004 regulations.

29. The petitioner. has decapitalized certain assets during the period 2001-04. These decapitalised assets were removed from the gross block to arrive at admissible additional capitalization by order 31.3.2005 for the purpose of capital cost.

30. In case of de-capitalization of physical assets, the cost of the asset and the accumulated depreciation, that is, 90% 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. 271.75 lakh and calculated depreciation charged on the assets till de-capitalisation amounting to Rs. 188.44 lakh.

31. On scrutiny of the details submitted by the petitioner along with the petition, it has been observed that the depreciation rates for the following assets adopted by the petitioner do not match with the depreciation rates as prescribed in the 2004 regulations:

A/c Code as per Form-12	Asset	Depreciation by in the petitioner	Depreciation rate as per the schedule
512309	Other electrical installations	11.25%	3.6%

32. Further, the list of assets in Form-12 includes "assets not owned by the company" to the tune of Rs.22.03 lakh with depreciation rate of 25%. The petitioner has clarified that it has adopted depreciation rate of 25% as per its accounting practice according to which the expenditure on assets not owned by it is to be amortized during four years' period, irrespective of useful life of the asset. We have considered the matter. The depreciation rate claimed by the petitioner will result into recovery of

accelerated depreciation. Therefore, we have allowed the depreciation rate corresponding to useful life of these assets furnished by the petitioner.

33. Accordingly, the weighted average depreciation rate for the tariff period has been calculated by taking the individual assets of the gross block as on 31.3.2004 and the respective depreciation rates as per the 2004 regulations. The weighted average depreciation rate works out as 3.51% , which has been considered .

34. The gross depreciable value of the asset, as per (ii) above, is  $0.9 \times (\text{Rs.}94543 \text{ lakh} - \text{Rs.}356 \text{ lakh}) = \text{Rs.}84768 \text{ lakh}$ . Cumulative depreciation and AAD recovered in tariff up to 31.3.2004 is Rs.67270 lakh. Remaining depreciable value as on 1.4.2004 is thus Rs.17686 lakh after adjusting for accumulated depreciation for decapitalised assets.

35. The entire loan gets repaid in 2004-05 as shown in the table below para 26 above. Therefore, depreciation for the years 2005-06 to 2008-09 has been spread over to the balance useful life of the generating station. The balance useful life of the generating station works out to 14 years as on 1.4.2005.

36. Accordingly, for the period 1.4.2004 to 31.3.2005 the depreciation works out to Rs. 3322 lakh by applying rate of depreciation of 3.51% as shown below and from 1.4.2005 to 31.3.2009 depreciation works out to Rs. 1031 lakh each year by distributing remaining depreciation over balance useful life:

(Rs. in lakh)

Details of Depreciation	Up to 31.3.2004	2004-05	2005-06	2006-07	2007-08	2008-09
As per order dated 24.10.2003	94070					
Addition during 2001-04 due to Additional Capitalisation	452					
Addition during 2001-04 due to FERV	21					
Gross Block as on 31.3.2004	94543	94543	94543	94543	94543	94543
Rate of Depreciation		3.51%				
Depreciable Value	84768					
Balance Useful life of the asset		14.93	13.93	12.93	11.93	10.93
Remaining Depreciable Value at the end of the year		14365	13334	12303	11272	10240
<b>Depreciation</b>		<b>3322</b>	<b>1031</b>	<b>1031</b>	<b>1031</b>	<b>1031</b>

### **ADVANCE AGAINST DEPRECIATION**

37. 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

38. 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.

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

## **O&M EXPENSES**

40. The 2004 regulations have prescribed the following O&M expense norms for 210 MW units-

	(Rs. lakh /MW)				
Year	2004-05	2005-06	2006-07	2007-08	2008-09
O&M expenses for 200/210 MW units	10.40	10.82	11.25	11.70	12.17

41. The petitioner has claimed O&M Expenses are as detailed below:

Years	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses (Rs in. lakh)	4368	4544	4725	4914	5111.40

42. 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.

43. 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, 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 during the tariff period.

44. 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>4368</b>	<b>4544</b>	<b>4725</b>	<b>4914</b>	<b>5111</b>

45. 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

46. In accordance with clause (v) of Regulation 21 of the 2004 regulations, working capital in case of Coal based/Lignite-fired generating stations shall cover:

- (i) Cost of coal or lignite for 1½ months for pit-head generating stations and two months for non-pit-head generating stations, corresponding to the target availability;
- (ii) Cost of secondary fuel oil for two months corresponding to the target availability;
- (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.

47. 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.

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

- (a) **Coal stock:** The petitioner in the amended petition has revised its claim for interest on working capital from July, 2004 onwards urging that the

price of coal has increased w.e.f 15.6.2004. 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 w.e.f 15.6.2004 cannot be accepted. The coal stock has been worked out for two months on the basis of operational parameters as described at para 59 and fuel prices considered for the computation of energy charges in para 65.. The fuel cost allowed in working capital is given hereunder, and is same as considered for computing base energy rate:

	2004-05	2005-06	2006-07	2007-08	2008-09
Weighted Avg. GCV of Coal (kCal/kg)	3519.00	3519.00	3519.00	3519.00	3519.00
Heat Contribution by Coal (kCal/kwh)	2480.04	2480.04	2480.04	2480.04	2480.04
Specific Coal Consumption (kg/kwh)	0.7048	0.7048	0.7048	0.7048	0.7048
Annual Requirement of Coal (MT)	2074354	2074354	2074354	2080037	2074354
Coal Stock (2 months) (MT)	345726	345726	345726	346673	345726
Weighted Avg. Price of Coal (Rs./MT)	1342.43	1342.43	1342.43	1342.43	1342.43
<b>Coal Stock-2 months- (Rs. in lakh)</b>	<b>4641.12</b>	<b>4641.12</b>	<b>4641.12</b>	<b>4653.84</b>	<b>4641.12</b>

- (b) **Oil Stock:** The oil stock for 2 months as per the operational parameters and weighted average price of secondary fuel oil as per para 64 and 65 has been considered, the details of which are extracted below:

	2004-05	2005-06	2006-07	2007-08	2008-09
Weighted Avg. GCV of Oil (kcal/Lit.)	9980.00	9980.00	9980.00	9980.00	9980.00
Heat Contribution by Oil (kcal/kWh)	19.96	19.96	19.96	19.96	19.96
Annual Requirement of Oil (ltrs)	5886720	5886720	5886720	5902848	5886720
Oil Stock(2 Months) (KL)	981.12	981.12	981.12	983.81	981.12
Weighted Avg. Price of Oil (Rs./KL)	13610.50	13610.50	13610.50	13610.50	13610.50
<b>Oil Stock-2 Months- (Rs. in lakh)</b>	<b>133.54</b>	<b>133.54</b>	<b>133.54</b>	<b>133.90</b>	<b>133.54</b>

(c) **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:

(d) **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 the purpose is given below :

(Rs.in lakh).

Year	2004-05	2005-06	2006-07	2007-08	2008-09
<b>Amount claimed for maintenance spares</b>	19.95	21.15	22.42	23.76	25.19

The spares requirement has been worked out by us based on the capital cost of Rs. Rs. 90971 lakh (including initial spares of Rs.1587 lakh.) as on 31.3.1992 (closing date of financial year in which the generating station was acquired). 1% of this cost has been escalated at the rate of 6% per annum to arrive at permissible spares consumption for the relevant year. The value of spares as on 1.4.2004 works out to Rs. 1697 lakh.

(e) **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
Variable Charges					
Coal (Rs/kWh)	1.0370	1.0370	1.0370	1.0370	1.0370
Oil (Rs/kWh)	0.0298	0.0298	0.0298	0.0298	0.0298
Rs./kWh	1.0669	1.0669	1.0669	1.0669	1.0669
Variable Charges per year	28648	28648	28648	28726	28648
<b>Variable Charges -2 months (Rs in lakh)</b>	<b>4774.66</b>	<b>4774.66</b>	<b>4774.66</b>	<b>4787.74</b>	<b>4774.66</b>
Fixed Charges - 2 months (Rs in lakh)	2630	2271	2304	2339	2374
<b>Receivables (Rs in lakh)</b>	<b>7405</b>	<b>7046</b>	<b>7079</b>	<b>7127</b>	<b>7149</b>

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

50. 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
Coal Stock	4641	4641	4641	4654	4641
Oil stock	134	134	134	134	134
O & M expenses	364	379	394	410	426
Spares	1697	1799	1906	2021	2142
Receivables	7405	7046	7079	7127	7149
<b>Total Working Capital</b>	<b>14240</b>	<b>13998</b>	<b>14154</b>	<b>14345</b>	<b>14492</b>
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
<b>Interest on Working Capital</b>	<b>1460</b>	<b>1435</b>	<b>1451</b>	<b>1470</b>	<b>1485</b>

### **ANNUAL FIXED CHARGES**

51. A statement showing summary of the capital cost and other related matters is annexed to 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)

<b>Particulars</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Interest on Loan	12	0	0	0	0
Interest on Working Capital	1460	1435	1451	1470	1485
Depreciation	3322	1031	1031	1031	1031
Advance Against Depreciation	0	0	0	0	0
Return on Equity	6618	6618	6618	6618	6618
O & M Expenses	4368	4544	4725	4914	5111
<b>TOTAL</b>	<b>15780</b>	<b>13629</b>	<b>13825</b>	<b>14033</b>	<b>14246</b>

### **ENERGY/VARIABLE CHARGES**

52. The petitioner had claimed rate of energy charges of 106.96 paise/kWh in the main petition which were revised in IA at 113.69 paise/kWh on the ground that the coal price has increased from 15.6.2004. The Fuel Price Adjustment clause provided in the 2004 regulations takes care of revision of energy charges on subsequent revision of coal price on month to month basis and base rate of energy charge need not be re-worked on the basis of increased coal prices w.e.f 15.6.2004.

53. The petitioner has considered the following operational norms for 210 MW units for the computation of base rate of energy charges in the main petition.

<b>Operational norms as petitioned</b>		
Sec. Oil Consumption	ml/kWh	2
Auxiliary Consumption	%	9
Heat Rate	Kcal/kWh	2500

54. The auxiliary energy consumption norm of 9% as considered in the petition is in order as per the 2004 regulations, applicable to 210 MW units with closed circuit cooling with cooling towers. However, respondents have objected that the closed circuit cooling system of the generating station does not remain in operation through

out the year and the cooling system operates on open cycle for substantial period of time during a year.

55. In view of the objection raised, the Commission vide order dated 21.2.2006 directed the petitioner to furnish data for the years 2001-02, 2002-03 and 2003-04 regarding operation of the C.W system in open cycle and closed cycle on month to month basis.

56. The data was furnished by the petitioner vide affidavit dated 9.3.2006 and is being reproduced as follows-

<b>Year</b>	<b>No. of days CTs are in service</b>	<b>No. of days units are on bar</b>	<b>%</b>
1999-2000	207	313.68	65.99
2000-2001	234	324.65	72.08
2001-02	165	325.47	50.70
2002-03	148	315.36	46.93
2003-04	151	327.24	46.14
2004-05	140	333.61	41.97
2005-06	165	317.40	51.99

57. The petitioner has further stated that wide variation as in above data is due to changes in the turbidity/debris in the water and period of canal closure for maintenance, both of which are beyond its control. However, it is felt that six years data as furnished by the petitioner would even out these uncertainties and weighted average auxiliary energy consumption based on the above data would fairly represent the mode of operation of the CW system of the generating station.

58. It is mentioned that the auxiliary consumption norm for the 210 MW units with open cycle cooling system is 8.5%. Accordingly, to account for the open cycle /closed

cycle mode of operation, the weighted average auxiliary consumption for the generating station works out to be 8.77 %.

59. Accordingly, the following operational norms have been adopted for the computation of base rate of energy charges.

<b>Operational norms as adopted</b>		
Sec. Oil Consumption	ml/kWh	2
Auxiliary Consumption	%	8.77
Heat Rate	Kcal/kWh	2500

60. The petitioner's claim of energy charges is based on the following weighted average fuel prices and GCV–

<b>Description</b>	<b>As considered in petition</b>	<b>Remarks</b>
Coal Price (Rs./MT)	1342.43	Procured during the preceding three months i.e Jan. to March,04
Coal GCV (Kcal/kg.)	3519	As fired
Price of Secondary fuel oil (Rs./KL)	13610.50	LDO procured during the month of March,02
GCV of Sec. Fuel oil (Kcal./KL)	9980	As fired

61. With regard to cost of the secondary fuel oil, the respondent Ajmer Vidyut Vitaran Nigam (AVVN) has submitted a certificate issued by the petitioner's Chartered Accountant based on PSL register, according to which the average rate of oil per KL for the months January 2004, February 2004 and March 2004 was Rs.8583.55 per KL and for coal it was Rs.1350.91 /MT. The respondent has submitted that the price of the secondary fuel oil for the preceding three months should be taken as per PSL register for working out the energy charges and the working capital requirements.

62. A wide difference in prices of secondary fuel oil based on procurement and based on PSL appears to be on account of the fact that consumption of secondary fuel oil is very low and procurement is done in small quantities as compared to the stock. There is not any significant difference in the prices of coal based on procurement basis and based on PSL register.

63. However, adopting different principles for coal and secondary fuel oil may not be appropriate. As such, energy charge has been computed based on the latest available procurement price of secondary fuel oil as well.

64. The Commission has so far considered the prices and GCV of the main secondary fuel oil, that is, HFO for the purpose of computation of fuel component in working capital and base rate of energy charge. However, for the instant station the last procurement of the LDO (secondary fuel oil) was in the month of March 2002 at a price of Rs.13610.50, which is very close to the price of HFO procured during the preceding three months (January 2004 to March 2004) at the other stations of the petitioner. Accordingly, the same rate has been adopted for the computation of fuel component in working capital and base rate of energy charge.

65. Accordingly, fuel price and GCV furnished by the petitioner in the petition and reproduced in para 60 above have been considered for the Base Energy Charge computation. The Base Energy Charges (BEC) computed based on the data furnished by the petitioner are summarised below:

### Computation of Energy Charges

Description	Unit	As considered
Capacity	MW	210.00
No. of operating hours corresponding to PLF 80%	80%	7008.00
Gross Station Heat Rate	kCal/kWh	2500.00
Specific Fuel Oil Consumption	MI/kWh	2.00
Aux. Energy Consumption	%	8.77
Weighted Average GCV of HFO	kCal/l	9980.00
Weighted Average GCV of Coal	kCal/Kg	3519.00
Weighted Average Price of Oil		13610.50
Weighted Average Price of Coal	Rs./MT	1342.43
Rate of Energy Charge from Sec. Fuel Oil	Paise/kWh	2.722
Heat Contributed from SFO	kCal/kWh	19.96
Heat Contributed from Coal	kCal/kWh	2480.04
Specific Coal Consumption	Kg/kWh	0.70
Rate of Energy Charge from Coal	Paise/kWh	94.607
<b>Rate of Energy Charge ex-bus per kWh Sent</b>	<b>Paise/kWh</b>	<b>106.685</b>

66. 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 notification dated 26.3.2004 provides 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: -

$$\text{FPA} = \text{A} + \text{B}$$

**Where,**

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

**A** – Fuel price adjustment for Secondary Fuel oil in Paise/kWh sent out

**B** – Fuel price adjustment for Coal in Paise/kWh sent out

**And,**

$$A = \frac{10 \times (SFC_n) \left\{ (P_{om}) - (P_{os}) \right\}}{(100 - AC_n)}$$

$$B = \frac{10}{(100 - AC_n)} \left[ \left\{ (SHR_n) (P_{cm}/K_{cm}) - (P_{cs}/K_{cs}) \right\} - (SFC_n) \left\{ (K_{om} \times P_{cm}/K_{cm}) - (K_{os} \times P_{cs}/K_{cs}) \right\} \right]$$

**Where,**

$SFC_n$  – Normative Specific Fuel Oil consumption in l/kWh

$SHR_n$  – Normative Gross Station Heat Rate in kCal/kWh

$AC_n$  – Normative Auxiliary Consumption in percentage

$P_{om}$  – Weighted Average price of fuel oil on as consumed basis during the month in Rs./KL.

$K_{om}$  – Weighted average GCV of fuel oils fired at boiler front for the month in Kcal/Litre

$P_{os}$  – Base value of price of fuel oils as taken for determination of base energy charge in tariff order in Rs. / KL.

$K_{os}$  – Base value of gross calorific value of fuel oils as taken for determination of base energy charge in tariff order in Kcal/Litre

$P_{cm}$  – Weighted average price of coal procured and burnt during the month at the power station in Rs. / MT.

- $K_{cm}$  – Weighted average gross calorific value of coal fired at boiler front for the month in Kcal/Kg
- $P_{cs}$  – Base value of price of coal as taken for determination of base energy charge in tariff order in Rs. /MT
- $K_{cs}$  – Base value of gross calorific value of coal as taken for determination of base energy charge in tariff order in kCal/Kg

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

67. In Petition No 139/2004 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 NTPC 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.

68. 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 equity on account of additional capitalisation on works.:

(Rs. in lakh)

<b>IMPACT OF ADDITIONAL CAPITAL EXPENDITURE DURING 2001-02,2002-03 AND 2003-04 NCTPP-DADRI (840 MW)</b>			
<b>CALCULATIONS</b>			<b>(Rs. in lakh)</b>
	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>
1. Additional capitalisation during the year vide order dated 31.3.2005 in Petition No.180/2004	8.6	446.7	(-) 3.2
2. Impact from 1st April of financial year following the financial year to which ACE relates.	0	8.6	446.7
3. Equity 50% as considered in tariff	0	4.3	227.65
4. Loan	0	4.3	227.65
5. Actual Rate of Interest after refinancing of Govt. loans		6.09%	6.09%
6. Rate of Equity allowed	16%	16%	16%
<b>IMPACT</b>			
(I) Interest on Loan	0	<b>0.26</b>	<b>13.86</b>
(ii) Return on Equity	0	<b>0.69</b>	<b>36.42</b>
<b>Total</b>		<b>0.95</b>	<b>50.29</b>

69. The petitioner has sought approval for the reimbursement of expenditure of Rs. 397287/- 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.

70. 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.

71. 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.

72. This order disposes of Petition No.142/2004.

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>Name of the Company</b>		<b>NTPC Ltd.</b>				
<b>Name of the Station</b>		<b>FEROZE GANDHI UNCHA HAR TPS -I</b>				
<b>Tariff setting Period</b>		<b>2004-09</b>				
<b>Petition No.</b>		<b>142/2004</b>				
<b>Rs. in lakh</b>						
<b>1</b>	<b>Capital Cost of the Project as on 31. 3.2001</b>					<b>94070.41</b>
<b>2</b>	<b>Additional Capitalisation(works)</b>					<b>452.10</b>
	2001-02				8.60	
	2002-03				446.70	
	2003-04				-3.20	
	Total				452.10	
<b>3</b>	<b>Additional Capitalisation (FERV) No:</b>					<b>21.00</b>
	2001-02				3.00	
	2002-03				16.00	
	2003-04				2.00	
	Total				21.00	
<b>4</b>	<b>Total Capital Cost as on 1.4.2004(1+3+4)</b>					<b>94543.51</b>
<b>5</b>	<b>Means of Finance<sup>1</sup> :</b>					
	Debt	50.00%			47271.76	
	Equity	50.00%			47271.76	
	Total	100.00%			94543.51	
<b>6</b>	<b>Debt details-Notional Debt (Net) as on 1.4.2004 Notional debt (Net) as on 1.4.2004</b>					<b>47272</b>
	Notional Debt(Gross i.e.50% of 94543 )				47271.76	
	Repayment up to 31.3.04				46869.31	
	Balance Debt				402.45	
<b>7</b>	<b>Weighted Av. Rate of interest-Calculated</b>					
	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	
	<b>5.85%</b>	<b>5.85%</b>	<b>5.85%</b>	<b>5.85%</b>	<b>5.85%</b>	
<b>8</b>	<b>Depreciation recovered up to 31.3.2009 :</b>					<b>74527</b>
			<b>Dep</b>	<b>AAD</b>	<b>Total</b>	
	Recovered up to 31.3.2001		56601	0.00	56601	
	1.4.2001 to 31.4.2004		10122	545.00	10667	
	1.4.2004 to 31.3.2009		7447	0.00	7447	
	ERV Impact - 2001-04		1	0.00	1	
	Less accumulated depreciation		188		-188	
	Total				74527	
<b>9</b>	<b>Balance Depreciation to be recovered beyond 31.3.2009 :</b>					
	<b>Capital cost for the purpose of Depreciation<sup>2</sup></b>				<b>94070</b>	
	<b>ACE + FERV</b>				<b>473</b>	
	<b>Capital cost as on 1.4.2004</b>				<b>94544</b>	
	<b>Less: Land Cost</b>				<b>356</b>	
					<b>94187</b>	
	<b>90% of Capital Cost as above</b>				<b>84768</b>	
	<b>Cum. Depreciation to be recovered up to 31.3.2009</b>				<b>74527</b>	
	<b>Balance</b>				<b>10241</b>	