

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram

1. Shri Ashok Basu, Chairperson
2. Shri Bhanu Bhushan, Member
3. Shri A.H. Jung, Member

**Petition No. 159/2004
with IA No. 44/2006**

In the matter of

**Approval of tariff in respect of Korba STPS (2100 MW) for the period
from 1.4.2004 to 31.3.2009.**

And in the matter of

National Thermal Power Corporation Ltd. — Petitioner

Vs

1. Madhya Pradesh State Electricity Board, Jabalpur.
2. Maharashtra State Electricity Board , Mumbai.
3. Gujarat Electricity Board, Vadodara.
4. Chhattisgarh State Electricity Board, Raipur.
5. Electricity Department, Govt. of Goa, Panaji.
6. Electricity Department, Administration of Daman & Diu,
Daman.
7. Electricity Department, Administration of Dadra & Nagar
Haveli, Silvassa. **— Respondents**

The following were present

1. Shri V.B.K. Jain, NTPC
2. Shri I.J. Kapoor, NTPC
3. Shri S.K. Sharma, NTPC
4. Shri A.S. Pandey, NTPC
5. Shri S.K. Khanna, NTPC
6. Shri Ashish Kumar, Adv., MPEPSCCL
7. Shri Siddharth Singh, MPEPSCCL
8. Shri D.K. Khandelwal, MPPTCL
9. Shri A.K. Garg, MPPTCL
10. Shri Kamlesh P. Jangla, GUVNL
11. Shri P.J. Jani, GUVNL
12. Shri U.V. Jewani, MSEDCL

ORDER
(DATE OF HEARING: 14.7.2006)

This petition has been filed by the petitioner, a generating company owned or controlled by the Central Government for approval of tariff in respect of Korba Super Thermal 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 comprises three units of 200 MW each and three units of 500 MW each. The dates of commercial operation of these units are given hereunder:-

Unit	Capacity (in MW)	Date of commercial operation.
I	200	1.8.1983
II	200	1.1.1984
III	200	1.6.1984
IV	500	1.3.1988
V	500	1.4.1989
VI	500	1.6.1990

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 6.8.2003 in Petition No 30/2001 based on capital cost of Rs.147388 lakh as on 31.3.2001

and included additional capitalisation and FERV up to that date. Subsequently, vide order dated 14.7.2005 in Petition No 195/2004, the Commission approved the additional capital expenditure of Rs. 21302 lakh on works against the petitioner's claim of Rs. 23955 lakh for the period 1.4.2001 to 31.3.2004 and arrived at the capital base of Rs.168690 lakh (excluding impact of FERV) as on 31.3.2004, for the purpose of determination of tariff from 1.4.2004. The petitioner vide IA No. 50/2005 revised the tariff claim based on a capital cost of Rs.169256 lakh which included admitted capital cost of Rs.147388 lakh as on 1.4.2001, FERV amounting to Rs.566 lakh and admitted additional capital expenditure of Rs.21302 lakh for the period 2001-04. The petitioner filed an amended petition accordingly. All references to the petitioner's claim are as per the amended petition.

4. The details of the revised fixed charges claimed by the petitioner are given hereunder:

(Rs. in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Interest on Loan	3136	2587	2138	1525	1298
Depreciation	6510	6510	6510	6510	6510
Advance against Depreciation	0	0	0	0	0
Return on Equity	11848	11848	11848	11848	11848
Interest on Working Capital	3373	3407	3444	3487	3527
O & M Expenses	20280	21087	21930	22800	23727
TOTAL	45147	45439	45871	46169	46911

5. The details of 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
Coal Stock	7785	7785	7785	7807	7785
Oil stock	1014	1014	1014	1017	1014
O & M expenses	1690	1757	1828	1900	1977
Spares	3503	3714	3936	4173	4423
Receivables	18919	18968	19040	19121	19213
Total Working Capital	32912	33238	33603	34016	34412
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on Working capital	3373	3407	3444	3487	3527

6. In addition, the petitioner has claimed energy charges @ 48.76 paise/kWh. The energy charges claimed are subject to adjustment for fuel price.

7. The reply to the petition was filed by MPSEB, MSEDCL(successor of Maharashtra State Electricity Board) and GUVNL(successor of Gujarat State Electricity Board) . 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.

8. 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. A similar approach has been adopted by the

Commission, while approving tariff in respect of the transmission assets of PGCIL and the generating systems owned by NHPC. In the interest of consistency and continuity of approach same methodology has been followed in the present case also.

CAPITAL COST

9. 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.

10. The petitioner has considered the capital expenditure of Rs.169256 lakh after accounting for additional capitalization of Rs.21302 lakh approved for the period 2001-04 and Rs.566 lakh on account of FERV for the period 1.4.2001 to 31.3.2004 over the capital expenditure of Rs.147388 lakh admitted by the Commission in the order dated 6.8.2003 *ibid.* The year-wise details of additional capitalization on works are given below:

Year	2001-02	2002-03	2003-04	(Rs. in lakh)
				Total
ACE	15492	1277	4533	21302

11. While dealing with the Petition No. 195/2004 for additional capitalization, the Commission had decided that the capitalization of new assets was not to be allowed for the purpose of tariff without reducing the gross value of the assets removed from the gross block. Accordingly, the petitioner was directed to furnish the value of the assets removed from service against which the petitioner

had capitalized new assets. The petitioner, vide affidavit dated 6.4.2005, had submitted value of assets removed from service. However, some of these removed assets of the value of Rs.76.33 lakh had not been de-capitalized inadvertently. These assets include ash discharge lines, HED valves, HPT and IPT fasteners, electro magnetic over band separators, PC terminals, furniture and typewriters etc. Since these assets were not in use as on 1.4.2004, the value of these assets has been considered for de-capitalisation for the purpose of tariff as on 1.4.2004.

12. Accordingly, the opening capital cost (excluding FERV) for the purpose of tariff for the period 2004-09 as on 1.4.2004 shall be Rs.168614 lakh which includes the capital cost of Rs.147388 lakh as on 31.3.2001 adopted by the Commission in its order dated 6.8.2003 in Petition No. 30/2001 for the purpose of tariff fixation for 2001-04 and the additional capitalization on works for the period 2001-04 approved by the Commission in its order dated 14.7.2005 in Petition No. 195/2004 and the decapitalisation of assets valued at Rs.76 lakh as per the preceding paragraph.

13. The petitioner, vide affidavit filed on 16.12.2005 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.

FERV/Extra Rupee Liability during the years 2001-04

14. The details of FERV claimed by the petitioner based on actual foreign currency loan outstanding are as follows:

(Rs. In lakh)

Year	2001-02	2002-03	2003-04	Total
FERV	(-)35	585	16	566

15. 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

16. 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.

17. The petitioner's claim for capitalization on account of FERV has been considered. In the present case, the notional outstanding loan exceeds the actual loan. The interest on loan is allowed on notional loan. Therefore, justice demands that the computation of FERV should also be based on notional loan. Based on notional foreign currency loan outstanding, FERV works out to Rs.606 lakh which has been admitted for tariff calculations as per the details given below:

(Rs in lakh)				
Year	2001-02	2002-03	2003-04	Total
FERV	(-) 37	626	17	606

18. Based on the above, the gross block as on 1.4.2004 comes to Rs.169220 lakh as per details given hereunder:

(Rs. in lakh)	
Capital cost admitted as on 31.3.2001.	147388
Additional Capitalization as approved for the years 2001-2004	21302
FERV admitted for the tariff period 2001-2004	606
Assets de-capitalized as on 1.4.2004	(-) 76
Opening Capital cost as on 1.4.2004	169220

DEBT-EQUITY RATIO

19. 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.

20. The Commission, while approving tariff vide its order dated 6.8.2003 in Petition No. 30/2001 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 and the additional capital expenditure on works and FERV are deemed to have been financed in the debt-equity ratio of 50:50. Accordingly, an amount of Rs.84610 lakh has been considered as equity as on 1.4.2004.

TARGET AVAILABILITY

21. 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

22. 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.

23 The petitioner has claimed Rs.11848 lakh as return on equity on the basis of notional equity of Rs.84628 lakh after accounting for equity on account of additional capitalization on works and FERV for the period 1.4.2001 to 31.3.2004. The claim has been limited to equity of Rs.84610 as stated in para 20 above and return on equity @ 14% has been worked out on the normative equity. The petitioner shall be entitled to return on equity of Rs.11845 lakh each year during the tariff period on equity of Rs.84610 lakh.

INTEREST ON LOAN

24. 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.

25. 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 6.8.2003 in petition no. 30/2001, to which notional loan arising out of additional capitalization on account of works and FERV for the period 2001-04 has been added.

(b) The cumulative repayment of loan up to 31.3.2004 has also been taken as per Commission's order dated 6.8.2003 in Petition no. 30/2001.

(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 for the same year, the re-payment has been considered to the extent of depreciation, as decided in para 8 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 drawls up to 31.3.2004 only have been considered.

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

CALCULATIONS OF WEIGHTED AVERAGE RATE OF INTEREST ON LOAN

(Rs. in lakh)					
Period	2004-05	2005-06	2006-07	2007-08	2008-09
United Bank of India					
Opening Balance	250	214	179	143	107
Addition/Drawl	0	0	0	0	0
Repayment	36	36	36	36	36
Closing Balance	214	178	143	107	71
Average Loan-INR	232	196	161	125	89
Rate of Interest	7.36%	7.36%	7.36%	7.36%	7.36%
Interest-INR	17	14	12	9	7
ICICI Bank – Tr. I					
Opening Balance	3010	2150	1290	430	0
Addition/Drawl	0	0	0	0	0
Repayment	860	860	860	430	0
Closing Balance	2150	1290	430	0	0
Average Loan-INR	2580	1720	860	215	0
Rate of Interest	12.56%	12.56%	12.56%	12.56%	12.56%
Interest-INR	324	216	108	27	0
UCO Bank – drawal – I					
Opening Balance	1000	857	714	571	429
Addition/Drawl	0	0	0	0	0
Repayment	143	143	143	143	143
Closing Balance	857	714	571	428	285
Average Loan-INR	929	786	643	500	357
Rate of Interest	7.36%	7.36%	7.36%	7.36%	7.36%
Interest-INR	68	58	47	37	26
UCO Bank – drawal – 5					
Opening Balance	2700	2314	1929	1543	1157
Addition/Drawl	0	0	0	0	0
Repayment	386	386	386	386	386
Closing Balance	2314	1929	1543	1157	771
Average Loan-INR	2507	2121	1736	1350	964
Rate of Interest	7.40%	7.40%	7.40%	7.40%	7.40%
Interest-INR	186	157	128	100	71
State Bank of India – I					

Opening Balance	2000	2000	1714	1429	1143
Addition/Drawl	0	0	0	0	0
Repayment	0	286	286	286	286
Closing Balance	2000	1714	1429	1143	857
Average Loan-INR	2000	1857	1571	1285	1000
Rate of Interest	9.65%	9.65%	9.65%	9.65%	9.65%
Interest-INR	193	179	152	124	97
State Bank of Patiala					
Opening Balance	150	129	107	86	64
Addition/Drawl	0	0	0	0	0
Repayment	21	21	21	21	21
Closing Balance	129	107	86	64	43
Average Loan-INR	139	118	96	75	54
Rate of Interest	7.31%	7.31%	7.31%	7.31%	7.31%
Interest-INR	10	9	7	5	4
Bank of Saurashtra					
Opening Balance	1000	857	714	571	429
Addition/Drawl	0	0	0	0	0
Repayment	143	143	143	143	143
Closing Balance	857	714	571	429	286
Average Loan-INR	929	786	643	500	357
Rate of Interest	7.36%	7.36%	7.36%	7.36%	7.36%
Interest-INR	68	58	47	37	26
IBRD - Main					
Opening Balance	1528	1419	1301	1175	1039
Addition/Drawl	0	0	0	0	0
Repayment	109	117	126	136	146
Closing Balance	1419	1301	1175	1039	893
Average Loan-INR	1473	1360	1238	1107	966
Rate of Interest	5.85%	5.85%	5.85%	5.85%	5.85%
Interest-INR	86	80	72	65	57
IBRD - A					
Opening Balance	35	26	18	9	0.01
Addition/Drawl	0	0	0	0	0
Repayment	9	9	9	9	0
Closing Balance	26	18	9	0.01	0.01
Average Loan-INR	31	22	13	4	0.01
Rate of Interest	6.64%	6.64%	6.64%	6.64%	6.64%
Interest-INR	2.04	1.46	0.87	0.29	0

IBRD - B					
Opening Balance	35	26	17	9	0
Addition/Drawl	0	0	0	0	0
Repayment	9	9	9	9	0.21
Closing Balance	26	17	9	0	(-) 0.21
Average Loan-INR	30	22	13	4	(-) 0.11
Rate of Interest	5.20%	5.20%	5.20%	5.20%	5.20%
Interest-INR	1.59	1.13	0.68	0.23	(-) 0.01
EURO BONDS					
Opening Balance	7	7	7	7	7
Addition/Drawl	0	0	0	0	0
Repayment	0	0	0	0	0
Closing Balance	7	7	7	7	7
Average Loan-INR	7	7	7	7	7
Rate of Interest	5.50%	5.50%	5.50%	5.50%	5.50%
Interest-INR	0.38	0.38	0.38	0.38	0.38
TOTAL LOAN					
Opening Balance	11715	9999	7990	5972	4374
Addition/Drawl	0	0	0	0	0
Repayment	1715	2009	2018	1598	1161
Closing Balance	9999	7990	5972	4374	3213
Average Loan	10857	8995	6981	5173	3794
Rate of Interest	8.8120%	8.5992%	8.2500%	7.8265%	7.5847%
Interest	957	773	576	405	288

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

COMPUTATION OF INTEREST ON LOAN

(Rs. in lakh)

	2004-05	2005-06	2006-07	2007-08	2009-04
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Gross loan-Opening	84610	84610	84610	84610	84610
Cumulative repayments of Loans up to previous year	67646	73912	80177	84610	84610
Net loan-Opening	16964	10698	4433	0	0
Increase/ Decrease due to FERV	0	0	0	0	0
Increase/ Decrease due to Additional Capitalisation	0	0	0	0	0
Total	16964	10698	4433	0	0
Repayments of Loans during the year	6266	6266	4433	0	0
Net loan-Closing	10698	4433	0	0	0
Average Net Loan	13831	7565	2216	0	0
Rate of Interest on Loan	8.8120%	8.5992%	8.2500%	7.8265%	7.5847%
Interest on loan	1219	651	183	0	0

DEPRECIATION

29. 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 capitalization on account of Foreign Exchange Rate Variation up to 31.3.2004 already allowed by the Central Government /Commission.

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

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

30. The petitioner has calculated the weighted average depreciation rate of 3.85% (excluding free hold land) based on the depreciation rates specified in Appendix II to the 2004 regulations.

30. 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 prescribed in the 2004 regulations:

Sl.No.(For m-12)	Asset	Dep. Rate as adopted in petition	Depreciation Rate applicable in
B 1, 2	Investment in lease hold land	3.66% / 4.46%	For the lease period of 90 years.
J3	Other office equipment – special	11.25%	Dep. Schedule does not qualify the office equipment into special or ordinary classes, hence depreciation @ 6% only allowed.
N4	Other electrical installations	11.25%	3.6%
R	Unserviceable assets	11.25%	0

31. 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 or as given in the preceding paragraph, as the case may be. The weighted average depreciation rate works out as 3.70%, which has been considered.

32. The gross depreciable value of the asset is $0.9 \times (\text{Rs.}169220 \text{ lakh} - \text{Rs.}1698 \text{ lakh}) = \text{Rs.}150769 \text{ lakh}$. After taking into consideration Rs.803 lakh towards amortization of lease land over a period of 25 years, the gross depreciable value comes to Rs.151572 lakh. Cumulative depreciation and AAD recovered in tariff up to 31.3.2004 is Rs.141527 lakh including depreciation on additional capitalization on works and FERV. Remaining depreciable value as on 1.4.2004 is thus Rs. 10045 lakh to be recovered beyond 31.3.2009.

33 The entire loan has been repaid during 2006-07. Therefore, from 2007-08 and onwards, depreciation is to be recovered based on the balance useful life.

34. The useful life of the generating station is 25.60 years after taking the weighted average life corresponding to the date of commercial operation of the generating station as 1.10.1987. The spent life of the generating station as on 1.4.2007 is 19.50 years. Thus the balance useful life as on 1.4.2007 will be 6.10 years. Accordingly, depreciation works out to Rs. 6266 lakh each year for the years 2004-05, 2005-06 and 2006-07 by applying rate of depreciation of 3.70% and Rs.2450 lakh each year for 2007-08 and 2008-09.

ADVANCE AGAINST DEPRECIATION

35. 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

36. 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.

37. The petitioner has not claimed Advance Against Depreciation. Accordingly, the petitioner is not entitled to Advance Against Depreciation.

O&M EXPENSES

38. The 2004 regulations have prescribed the following O&M expense norms for 200 MW and 500 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
O & M expenses for 500 MW units	9.36	9.73	10.12	10.52	10.95

39. The petitioner has claimed O&M expenses are as detailed below:

(Rs.In lakhs)

Years	2004-05	2005-06	2006-07	2007-08	2008-09
Annual O & M expenses	20280	21087	21930	22800	23727

40. 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.

41. 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
O&M expenses	20280	21087	21930	22800	23727

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.

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

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

(a) Coal stock: The petitioner 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. As per the 2004 regulations, coal cost for 1.5 months for pit-head generating station corresponding to target availability is permissible. Accordingly, the coal cost has been worked out for 1.5 months.

(b) Oil Stock: The oil stock for 2 months oil has been considered. Details of the fuel component in working capital is as under:

	(Rs. In lakh)				
	2004-05	2005-06	2006-07	2007-08	2008-09
Cost of coal for 1.5 months	7497.20	7497.20	7497.20	7517.74	7497.20
Cost of secondary fuel Oil for 2 months	688.01	688.01	688.01	689.90	688.01

(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 the respective year

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
Amount claimed for maintenance spares	3503.3	3713.5	3936.3	4172.5	4422.8

The spares requirement has been worked out by us based on the historical cost of Rs.123080 lakh (including initial spares of Rs.5725 lakh) as on 31.3.1991 (closing date of the financial year of commercial operation of the generating station), 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. 2495 lakh.

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)	0.4426	0.4426	0.4426	0.4426	0.4426
Oil (Rs/kWh)	0.0305	0.0305	0.0305	0.0305	0.0305
Rs./kWh	0.4731	0.4731	0.4731	0.4731	0.4731
Variable Charges per year	64106	64106	64106	64281	64106
Variable Charges -2 months (Rs in lakh)	10684	10684	10684	10714	10684
Fixed Charges - 2 months (Rs in lakh)	7116	7160	7228	6702	6863
Receivables (Rs in lakh)	17800	17845	17912	17416	17547

44. 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.

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

Calculation of Interest on Working Capital

	(Rs. in lakh)				
	2004-05	2005-06	2006-07	2007-08	2008-09
Coal Stock	7497	7497	7497	7518	7497
Oil stock	688	688	688	689	688
O & M expenses	1690	1757	1828	1900	1977
Spares	2495	2645	2803	2971	3150
Receivables	17800	17845	17912	17416	17547
Total Working Capital	30170	30432	30728	30495	30860
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on Working Capital	3092	3119	3150	3126	3163

ANNUAL FIXED CHARGES

46. A statement showing summary of the capital cost and other related details of the generating station is annexed to this order. The annual fixed charges for the period 1.4.2004 to 31.3.2009 allowed in this order are summed up as below:

	(Rs. in lakh)				
Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Interest on Loan	1219	651	183	0	0
Interest on Working Capital	3093	3119	3150	3126	3163
Depreciation	6266	6266	6266	2450	2450
Advance Against Depreciation	0	0	0	0	0
Return on Equity	11845	11845	11845	11845	11845
O & M Expenses	20280	20187	21930	22800	23727
TOTAL	42702	42968	43374	40221	41186

ENERGY / VARIABLE CHARGES

47. The petitioner had claimed rate of energy charges of 48.76 paise/kWh based on the weighted average price and GCV of coal and secondary fuel oils(HSD=HFO) procured and burnt during preceding three months(January to March 2004).

48. The petitioner has considered the following operational norms for the computation of base rate of energy charges.

Operational norms as petitioned		
Sec. Oil Consumption	ml/kWh	2
Auxiliary Consumption	%	7.93
Heat Rate	Kcal/kWh	2464.29

49. The operational norms as considered in the petition are in order as per the 2004 regulations, applicable to a plant comprising three units of 200 MW(BPF electrically driven with cooling towers) and three units of 500 MW(BPF steam driven with cooling towers).

50. The petitioner's claim of energy charges is based on the following weighted average prices and GCV of fuels:

Description	Claimed by the petitioner	Allowed
Coal Price (Rs./MT)	548.60	548.55
Coal GCV (Kcal/kg.)	3289.40	3289.40
Price of Secondary fuel oil (Rs./KL)	20674.33 (HSD+HFO)	14025 (HFO)
GCV of Sec. Fuel oil (Kcal./KL)	10156.86	10215.27

51. The Commission has considered HFO as the main secondary oil fuel for the purpose of base rate of energy charge and computation of fuel component in working capital since it is used for hot boiler start up and flame stability during the low load conditions whereas HSD/LDO are used only during the cold boiler start up. FPA clause provided in the 2004 regulation will take care of the cost of HSD used by the generating station on “as consumed basis” on month to month basis. The petitioner may, therefore, claim reimbursement of HSD whenever used.

52. Accordingly, fuel price and GCV furnished by the petitioner in the petition and extracted above have been considered for the Base Energy Charge computation. The Base Energy Charges (BEC) computed are summarised below:

Computation of Energy Charges

Description	Unit	As considered
Capacity	MW	2100
No. of operating hours corresponding to PLF 80%		80%
Gross Station Heat Rate	kCal/kWh	2464.29
Specific Fuel Oil Consumption	ml/kWh	2.00
Aux. Energy Consumption	%	7.93
Weighted Average GCV of HFO	kCal/l	10215.27
Weighted Average GCV of Coal	kCal/kg	3289.4
Weighted Average Price of Oil	Rs/kl	14025
Weighted Average Price of Coal	Rs./MT	548.55
Rate of Energy Charge from Sec. Fuel Oil	Paise/kWh	2.81
Heat Contributed from SFO	kCal/kWh	20.43
Heat Contributed from Coal	kCal/kWh	2443.86
Specific Coal Consumption	kg/kWh	0.74
Rate of Energy Charge from Coal	Paise/kWh	40.75
Rate of Energy Charge ex-bus per kWh Sent	Paise/kWh	47.31

53. 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: -

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

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,

$$A = \frac{10 \times (\text{SFC}_n)}{(100 - \text{AC}_n)} \left\{ (P_{om}) - (P_{os}) \right\}$$

$$B = \frac{10}{(100 - \text{AC}_n)} \left\{ \left\{ (\text{SHR}_n) \left(\frac{P_{cm}}{K_{cm}} - \frac{P_{cs}}{K_{cs}} \right) \right\} - (\text{SFC}_n) \left\{ \left(k_{om} \times \frac{P_{cm}}{K_{cm}} - k_{os} \times \frac{P_{cs}}{K_{cs}} \right) \right\} \right\}$$

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

54. In Petition No 194/2004 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 petitioner is

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 1st April of the financial year following the financial year to which additional capital expenditure relates.

55. Based on the above, the petitioner shall be entitled to recover an amount of Rs.4210.12 lakh from the respondents through tariff on account of return on equity and interest on loan on additional equity and (notional) loan on account of additional capitalization on works.:

(Rs. in lakh)

IMPACT OF ADDITIONAL CAPITAL EXPENDITURE DURING 2001-02, 2002-03 and 2003-04			
Period	2001-02	2002-03	2003-04
Additional capitalization	15492.18	1276.97	4532.99
Notional loan	7746.09	638.49	2266.50
Notional equity	7746.09	638.49	2266.50
Effective additional capitalization			
Opening loan balance	0.00	7746.09	8384.58
Addition of loan	7746.09	638.49	2266.50
Repayment of loan	0	0	0
Closing loan balance	7746.09	8384.58	10651.07
Effective loan		7746.09	8384.58
Average Rate of interest on loan		8.7904%	11.3101%
Effective equity		7746.09	8384.58
Interest on loan		680.91	948.30
Return on equity (16%)		1239.37	1341.53
Total		1920.28	2289.84

56. The petitioner has sought approval for the reimbursement of expenditure of Rs.2,56,131/- 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.

IA No.44/2006

57. The petitioner had filed IA No.44/2006 has submitted that Government of Chhatisgarh vide notification dated 21.3.2006 has enhanced the water charges from Rs.1.50 per cubic meter to Rs.3.60 per cubic meter as a result of which the expenditure towards water charges is estimated to be Rs.21.60 crore during 2006-07 as against Rs.9.69 crore incurred during 2003-04. The petitioner prayed for reimbursement of water charges at the enhanced rate. The representative of the petitioner did not press the interlocutory application and submitted that the petitioner would make a separate application for this purpose. Accordingly, the interlocutory application is dismissed as withdrawn with liberty to the petitioner to approach the Commission in a separate petition for reimbursement of water charges in accordance with law.

58. 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.

59. 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.

60. This order disposes of Petition No.159/2004.

Sd/-
(A.H. JUNG)
MEMBER

Sd/-
(BHANU BHUSHAN)
MEMBER

Sd/-
(ASHOK BASU)
CHAIRPERSON

New Delhi dated the 19th July, 2006

Summary Sheet

Name of the Company		NTPC Ltd.				
Name of the Station		KORBA(2100 MW)				
Tariff setting Period		2004-09				
Petition No.		159/2004				
				Rs.in lakh		
1	Capital Cost of the Project as on 31.3.2001			147388		
2	Additional Capitalisation(works)			21302		
	2001-02			15492		
	2002-03			1277		
	2003-04			4533		
	Total			21302		
3	Decapitalization as on 1.4.2004			76		
4	Additional Capitalization(FERV)			606		
	2001-02			(-)37		
	2002-03			626		
	2003-04			17		
	Total			606		
5	Total Capital Cost as on 1.4.2004(1+3+4)			169220		
6	Means of Finance :					
	Debt	70%		84610		
	Equity	30%		84610		
	Total	100%		169220		
7	Normative Loan as on 1.4.2004			16964		
	Normative Loan outstanding as on 1.4.2004			6048		
	Normative Loan due to ACE + FERV in 2001-04			10954		
	Reduction due to de-capitalization as on 1.4.2004			38		
	Total Normative Loan as on 1.4.2004			16964		
8	Cumulative repayment up to 31.3.2009			84610		
	Repaid up to 31.3.2004			67646		
	1.4.2001 to 31.3.2004 (ACE + FERV)			0		
	1.4.2004 to 31.3.2009			16964		
	Total			84610		
9	Balance Normative Loan to be repaid beyond 31.3.2009			0		
10	Depreciation recovered up to 31.3.2009			141527		
			Dep	AAD	Total	
	Recovered upto 31.3.2004			118751	122	118873
	1.4.2001 to 31.3.2004 (ACE + FERV)			32	0	32
	1.4.2004 to 31.3.2009			23697	0	23697
	Adj. of Cum. Dep. due to de-capitalization			(-)1075	0	(-)1075
	Total					141527
11	Balance Depreciation to be recovered beyond 31.3.2009 :				10045	
	Capital cost for the purpose of Depreciation				147388	
	ACE + FERV				21907	
	De-capitalization as on 1.4.2004				76	
	Capital cost as 1.4.2004				169220	
	Less: Land Cost				1698	
					167521	
	90% of Capital Cost as above				150769	
	Amortisation of lease land in 25 years				803	
	90% dep. value including lease amortization				151572	
	Cum. Dep. to be recovered up to 31.3.2009				141527	
	Balance dep. to be recovered beyond 31.3.2009				10045	