

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

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

Petition No.164/2004

In the matter of

Approval of tariff from 1.4.2004 to 31.3.2009 in respect of Auraiya Gas Power Station

And in the matter of

National Thermal Power Corporation Ltd.

....Petitioner

Vs

1. Uttar Pradesh Power Corporation Ltd., Lucknow
 2. Jaipur Vidyut Vitran Nigam Ltd, Jaipur
 3. Ajmer Vidyut Vitran Nigam Ltd, Ajmer
 4. Jodhpur Vidyut Vitran Nigam Ltd, Jodhpur
 5. Delhi Transco Ltd, New Delhi
 6. Haryana Vidyut Prasaran Nigam Ltd, Panchkula
 7. Punjab State Electricity Board, Patiala
 8. Himachal Pradesh State Electricity Board, Shimla
 9. Power Development Department, J&K, Srinagar
 10. Power Department, Union Territory of Chandigarh, Chandigarh
 11. Uttaranchal Power Corporation Ltd., 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 Balaji Dubey, NTPC
8. Shri S.K. Johar, NTPC
9. Shri Guryog Singh, NTPC
10. Shri Ajay Garg, NTPC
11. Shri Ajay Dua, NTPC
12. Shri G.K. Dua, NTPC
13. Ms. Alka Saigal, NTPC
14. Shri Satya Prakash, NTPC
15. Shri T.K. Srivastava, UPPCL
16. Shri T.P.S. Bawa, OSD, PSEB
17. Shri H. Vyas, DTL
18. Shri V.K. Garg, DTL

ORDER

(Date of Hearing: 16.2.2006)

The petitioner has filed this petition for approval of tariff in respect of 663.36 MW Auraiya Gas Power Station (hereinafter referred to as “the generating station”) for the period from 1.4.2004 to 31.3.2009 in terms of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004 (hereinafter referred to as “the 2004 regulations”). The petitioner has also prayed that it be allowed the additional capitalisation for the capital expenditure incurred during the years 2001-02 to 2003-2004 and the interest on loan and return on equity thereon be approved. The petitioner has also prayed for reimbursement from the beneficiaries of expenditure towards publishing of notices in newspapers and filing fee.

2. The generating station was declared under commercial operation with effect from 1.12.1990. The Central Government in Ministry of Power accorded its approval for the Revised Cost Estimate for the generating station at a cost of Rs.66533 lakh; excluding Working Capital Margin of Rs.1344.00 lakh vide its letter dated 21.10.1994. The tariff for the period 1.4.2001 to 31.4.2004 was approved by the Commission in its order dated 19.11.2004 in Petition No. 46/2001. The Commission has also approved the additional capital expenditure of Rs.326.30 lakh for the years 2001-02, 2002-03 and 2003-04 in its order dated 15.4.2005 in Petition No.176/2004.

3. The petitioner filed IA No. 49/2005 for amendment of the present petition to bring on record the additional capitalization for the period 2001-04 as approved by the Commission by order dated 15.4.2005 in Petition No. 176/2004 and to allow the petitioner to recover the impact of additional capitalization from the beneficiaries. The

IA is allowed. The petitioner's claim for approval of tariff has been considered based on the amended petition.

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

(Rs in lakh)

Ser NO	particulars	2004-05	2005-06	2006-07	2007-08	2008-09
1.	Depreciation	3262	0	0	0	0
2.	Interest on loan	7	6	4	3	2
3.	Return on equity	5200	5200	5200	5200	5200
4.	Advance Against Depreciation	0	0	0	0	0
5.	Interest on Working Capital	3069	3027	3043	3066	3076
6.	O&M Expenses	5603	5828	6061	6303	6555
7.	Total	17141	14060	14308	14572	14833

5. The necessary details of Working Capital furnished by the petitioner and its claim for interest thereon are summarised hereunder:

(Rs. in lakh)

Ser	Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
1.	Spares	1445	1532	1624	1721	1824
2.	O&M expenses	467	486	505	525	546
3.	Recievables	14970	14457	14498	14575	14585
4.	Liquid fuel	7002	7002	7002	7021	7002
5.	Fuel cost for one month	6057	6057	6057	6073	6057
6	Total working capital	29941	29533	29685	29915	30015
7.	Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
8.	Interest	3069	3027	3043	3066	3076

6. 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	94.39	134.10
Rate of Energy Charge ex-bus per kWh sent (Naphtha)	Paise/ /kWh	372.66	529.44

7. The replies to the petition have been filed by Uttar Pradesh Power Corporation Ltd, Jaipur Vidyut Vitran Nigam Ltd, Ajmer Vidyut Vitran Nigam Ltd, Jodhpur Vidyut Vitran Nigam Ltd, Punjab State Electricity Board and Haryana Vidyut Prasaran Nigam Ltd . In response to the public notices published by the petitioner in accordance with the procedure specified by the Commission, no comments have been received from the general public.

CAPITAL COST

8. As per Regulation 17 of the CERC (Terms and Conditions of Tariff) Regulations, 2004, in case of projects existing prior to 31.3.2004, the capital cost admitted by the Commission prior to 1.4.2004 shall form the basis for determination of tariff.

9. The petitioner has considered the capital expenditure of Rs 72415 lakh as admitted by the Commission in its order dated 19 .11.2004 in Petition No.46/2001. The petitioner has also considered Rs.326.30 lakh on account of additional capital expenditure incurred during 2001-02, 2002-03 and 2003-04 as approved by the Commission in its order dated 15.4.2005 in Petition No.176/2004 as per the details given below:

Year	ACE (Rs. In lakh)
2001-02	66.76
2002-03	150.59
2003-04	108.96
Total	326.30

10. The petitioner in its affidavit dated 25.11.2005 has confirmed that all the assets included in the balance sheet of the generating station for 2003-04 were in use as on 1.4.2004.

11. Accordingly, Rs.326.30 lakh has been added to arrive at the gross block as on 1.4.2004 for the purpose of tariff fixation.

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

12. The petitioner has claimed capitalization of Rs.1539 lakh on account of FERV during the period 2001-04 as per the details given below, stated to be based on actual loan:-

Year	2001-02	2002-03	2003-04	Total
FERV(Rs in lakh)	(-)356	1895	0	1539

13. Regulation 1.13 (a) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2001 provides 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

14. Regulation 1.7 of the 2001 further provides 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.

15. The petitioner's claim for capitalization of Rs.1539 lakh is based on actual loan. In terms of the decision of the Commission in Petition No.160/2004 for approval of tariff for Anta GPS, additional capitalization on account of FERV has been restricted to the normative loan. Accordingly, an amount of Rs.1214 lakh has been allowed for capitalization on account of FERV, which corresponds to notional loan outstanding during the period 1.4.2001 to 31.3.2004 in foreign currency.

16. Based on the above, the gross block as on 1.4.2004 after adjustment of additional capitalization on account of works and FERV works out as under:-

(Rs in lakh)	
Admitted cost for 2001-04	72415
Admitted Additional Capitalisation during 2001-04	326
FERV for 2001-04 as calculated on normative loan	1214
Gross Block as on 1.4.2004	73955

DEBT-EQUITY RATIO

17. Regulation 20(1) of the 2004 regulations 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.

18. The debt-equity ratio of 50:50 was considered by the Commission in its order dated 19.11.2004 in Petition No.46/2001 in respect of the tariff for the period 1.4.2001 to 31.3.2004. In accordance with the provision of Regulation 20(1) as quoted in

preceding paragraph, the debt-equity ratio of 50:50 has been adopted for computation of tariff for the period 1.4.2004 to 31.3.2009. Additional capitalisation on account of works and FERV has been deemed to have been financed through debt and equity in the ratio of 50:50. Accordingly, for the purpose of tariff, an amount of Rs. 36977 lakh has been considered as equity as on 1.4.2004.

TARGET AVAILABILITY

19. 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

20. As per Regulation 21(iii) of 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.

21. The return on equity has been worked out @14% per annum on the average normative equity. The charges payable by the respondents on account of return on equity would be Rs.5177 lakh per annum.

INTEREST ON LOAN

22. 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

23. The petitioner has stated that during 2002-03, various GOI loans, bearing interest rates ranging from 14% to 17% were appearing in the balance sheet. It was decided with the approval of GOI to prepay the loans by issue of bonds bearing interest rate ranging from 8.05% to 9.55% per annum. In case of the generating station, loans to the extent of Rs10547 lakh was refinanced through bonds. It has been further submitted by the petitioner that though the rates of interest on the new borrowings are much lower than the GOI loans, but due to the moratorium period applicable to the new loans, the incidence of interest expenditure on the new loans during the tariff period 2004-09 is higher compared to the GOI loans. The petitioner has calculated the interest on loan on the basis of the originally contracted GOI loans since the rate of interest on the refinanced loan is not in the interest of the

beneficiaries. The respondents have questioned the rationale for swapping of the loans since it is not beneficial to the beneficiaries.

24. In the instant petition, calculation of interest on loan has been carried out as under:

(a) The gross opening normative loan of Rs.706 lakh outstanding as per order dated 19.11.2004 in Petition No.46/2001 has been considered.

(b) Notional loan Rs.770 lakh has arisen due to additional capitalization approved by the Commission in its order dated 15.4.2005 in Petition No.176/2004 and capitalization of FERV. The same has been added to the normative outstanding loan to arrive at the total outstanding notional loan of Rs.1476 lakh.

(c) The cumulative repayment of loan up to 31.3.2004 has also been taken as per Commission's order dated 19.11.2004 in petition No. 46/2001.

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

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

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

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

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

(h) The weighted average rate of interest considered for calculation of interest is that of Bonds XIV which have replaced the high interest bearing GOI loans.

(i) Financial charges @ 0.03% in the form of Surveillance fees for Bond XIV has been allowed.

(j) 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)

	Details of Loan	2004-05	2005-06	2006-07	2007-08	2008-09
1	Bond-XIV Series					
	Net Loan-Opening	10546.43	10546.43	10546.43	5273.22	0.00
	Repayment during the year	0.00	0.00	5273.22	5273.22	0.00
	Net Loan-Closing	10546.43	10546.43	5273.22	0.00	0.00
	Average Loan	10546.43	10546.43	7909.82	2636.61	0.00
	Rate of Interest	8.08%	8.08%	8.08%	8.08%	8.08%
	Interest	852.15	852.15	639.11	213.04	0.00
	Repayment Schedule	2 Annual instalments wef 01.08.06				
	Total Loan					
	Net Loan-Opening	10546.43	10546.43	10546.43	5273.22	0.00
	Repayment during the year	0.00	0.00	5273.22	5273.22	0.00
	Net Loan-Closing	10546.43	10546.43	5273.22	0.00	0.00
	Average Loan	10546.43	10546.43	7909.82	2636.61	0.00
	Rate of Interest	8.0800%	8.0800%	8.0800%	8.0800%	0.0000%
	Interest	852.15	852.15	639.11	213.04	0.00

26. The computations of interest on notional loan by applying weighted average interest rate as determined above are also appended hereinbelow:

COMPUTATION OF INTEREST ON NOTIONAL LOAN

	(Rs. in lakh)				
	2004-05	2005-06	2006-07	2007-08	2008-09
Gross loan-Opening	36977	36977	36977	36977	36977
Cumulative repayments of Loans up to previous year	35501	36977	36977	36977	36977
Net loan-Opening	1476	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	1476	0	0	0	0
Repayments of Loans during the year	1476	0	0	0	0
Net loan-Closing	0	0	0	0	0
Average Net Loan	738	0	0	0	0
Rate of Interest on Loan	8.08%	8.08%	8.08%	8.08%	8.08%
Interest on loan	60	0	0	0	0

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 cost of land in the present case is Rs.994 lakh. The gross depreciable value of the asset, excluding land cost, as per (ii) above, is $0.9 \times (\text{Rs.}73955 \text{ lakh} - \text{Rs.}994 \text{ lakh}) = \text{Rs.}65664 \text{ lakh}$. Cumulative depreciation and AAD recovered in tariff up to 31.3.2004 is Rs.62756 lakh, including depreciation on additional capitalization/decapitalisation for the period 1.4.2001 to 31.3.2004. After adjustment of cumulative depreciation due to additional capitalization/decapitalisation, the balance depreciable value as on 1.4.2004 comes to Rs.2908 lakh.

29. The petitioner has decapitalised physical assets of value of Rs.31.44 lakh during 2001-04, and considered in the order dated 15.4.2005 in Petition No. 176/2004. The petitioner has adjusted an amount of Rs.28.21 lakh on account of depreciation recovered on these assets. However, in our calculations, an amount of Rs.28 lakh has been adjusted, based on depreciation rates specified.

30. The weighted average depreciation rate (excluding cost of land) calculated by taking the individual assets of gross block as on 31.3.2004 works out to 4.81% as against weighted average rate of 4.97% claimed in the petition. Further, as the entire notional loan has been repaid, the remaining value of the assets has been distributed over the balance useful life of the assets in the year 2008-09.

31. Based on the above, for the period 1.4.2004 to 31.3.2005 the depreciation works out to Rs.2908 lakh which shall be recovered through tariff. No depreciation shall be recovered after 31.3.2005 since by then full depreciable value is recovered.

ADVANCE AGAINST DEPRECIATION

32. 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

33. 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.

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

O&M EXPENSES

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

(Rs. in lakh/MW)

Year	2004-05	2005-06	2006-07	2007-08	2008-09
O&M expenses/ MW	5.2	5.41	5.62	5.85	6.08

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

Years	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses (Rs in. lakh)	5603	5828	6061	6303	6555

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

38. The petitioner has submitted that the 10 year warranty period has expired in August 1998 and O&M charges claimed by them are higher than the normative O&M expenses due to the following reasons:

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- (i) Higher repair and maintenance (R&M) expenses due to aging, higher replacement cost of spares, equipment failure etc. and
- (ii) Inclusion of cost of spares consumed at actuals after the warranty period and inclusion of additional capitalisation disallowed.

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

- (a) Details of actual O&M expenses from the date of commercial operation of 1st GT of each of the generating stations to 2004-05,

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

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

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41. 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.

42. 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.

43. 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	3449	3589	3728	3881	4033

44. 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.

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INTEREST ON WORKING CAPITAL

45. In accordance with clause (v) of Regulation 21 of the 2004 regulations, working capital in case of gas based generating stations shall cover:

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(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;

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(ii) Liquid fuel stock for ½ month;

(iii) Operation and maintenance expenses for one month;

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(iv) Maintenance spares at 1% of the historical cost escalated @ 6% per annum from the date of commercial operation; and

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~~Deleted: 20% of the annual operation and maintenance expenses~~

(v) Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on target availability.

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46. 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.

~~Deleted: Coal based/Lignite-fired generating stations~~

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

(a) Fuel Cost

(i) 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, 76% gas and 24% on liquid fuel.

(Rs. in lakh)

<u>Particulars</u>	<u>2004-05</u>	<u>2005-06</u>	<u>2006-07</u>	<u>2007-08</u> <u>(Leap Year)</u>	<u>2008-09</u>
<u>Fuel Cost for 1 Month</u>	<u>6057</u>	<u>6057</u>	<u>6057</u>	<u>6073</u>	<u>6057</u>
<u>Liquid fuel stock for 1/2 month</u>	<u>7002</u>	<u>7002</u>	<u>7002</u>	7021	7002

(ii) 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 76% availability of the generating station was declared on gas and the remaining 24% on liquid fuel. Therefore, the liquid fuel stock for ½ month has been considered in proportion to the availability declared on that fuel and it has been calculated accordingly.

(iii) 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. As per the 2004 regulations, fuel cost for one month corresponding to normative target availability is to be included in the working capital. Accordingly, the fuel cost / fuel stock has been worked out for one two months on the basis of operational parameters given in the notification dated 26.3.2004 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.

(Rs in lakh)

<u>Description</u>	<u>1.4.2004 to 31.3.2007 and 1.4.2008 to 31.3.2009</u>	<u>1.4. 2007 to 31.3.2008 (Leap Year)</u>
<u>Value of stock of Naphtha for 1/2 month</u>	1680	1685
<u>Fuel Cost-1Month</u>	6057	6073

(b) O&M Expenses: O&M expenses for working capital as worked out for 1 month of O&M expenses in para 43 above are considered in tariff of the respective year:

(c) Maintenance Spares: The petitioner has calculated the value of maintenance spares for the purpose of working capital considering additional capital expenditure in the respective year after the date of commercial operation. The amount claimed for maintenance spares for IWC calculation by the petitioner are as given below:

(Rs in lakh)

<u>Year</u>	<u>2004-05</u>	<u>2005-06</u>	<u>2006-07</u>	<u>2007-08</u>	<u>2008-09</u>
<u>Amount claimed for maintenance spares</u>	1445	1532	1624	1721	1824

The historical cost as on the date of commercial operation, that is, 1.12.1990 is not made available on records. However, as per Government of India tariff notification, dated 31.3.1993, the capital cost available is Rs. 61723 lakh and the same has been adopted for the computation of maintenance spares. The additional capitalization thereafter has not been considered as part of the historical cost.

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

Computation of receivables component of Working Capital

	2004-05	2005-06	2006-07	2007-08	2008-09
Variable Charges					
Rs./kWh	1.612	1.612	1.612	1.612	1.612
Variable Charges per year	72680	72680	72680	72879	72680
Variable Charges -2 months (Rs in lakh)	12113	12113	12113	12146	12113
Fixed Charges - 2 months (Rs in lakh)	2335	1857	1882	1910	1936
Receivables (Rs in lakh)	14448	13970	13995	14056	14050

Rate of interest on working capital

48. The petitioner has claimed interest @ 10.25 on working capital. The same is allowed since it is in line with the Commission's earlier decision to consider the average SBI PLR of 10.25 % as applicable on 1.4.2004 as the rate of interest on working capital during the tariff period 2004-05 to 2008-09.

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

Calculation of Interest on Working Capital

(Rs. in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Fuel Cost for one month	6057	6057	6057	6073	6057
HSD Stock for ½ month	1680	1680	1680	1685	1680
O & M expenses	287	299	311	323	336
Spares	1085	1150	1219	1292	1369
Receivables	14448	13970	13995	14056	14050
Total Working Capital	23557	23155	23261	23430	23492
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on allowed Working Capital	2415	2373	2384	2402	2408

ANNUAL FIXED CHARGES

50. A summary sheet showing the details of capital cost, etc is annexed with 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
Depreciation	2908	0	0	0	0
Interest on Loan	60	0	0	0	0
Return on Equity	5177	5177	5177	5177	5177
Advance against Depreciation	0	0	0	0	0
Interest on Working Capital	2415	2373	2384	2402	2408
O & M Expenses	3449	3589	3728	3881	4033
TOTAL	14009	11139	11289	11459	11618

ENERGY/ VARIABLE CHARGES

51. The petitioner has claimed following base energy charges:

<u>Description</u>	<u>Unit</u>	<u>Combined Cycle</u>	<u>Open Cycle</u>
<u>Rate of Energy Charge ex-bus per kWh sent (Gas)</u>	<u>Paise/ /kWh</u>	94.39	134.10
<u>Rate of Energy Charge ex-bus per kWh sent (Naphtha)</u>	<u>Paise/ /kWh</u>	372.66	529.44

52. 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-

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<u>Description</u>	<u>Unit</u>	<u>Combined Cycle Operation</u>	<u>Open Cycle Operation</u>
<u>Gross Station Heat Rate</u>	<u>kCal/kWh</u>	2100	3045
<u>Auxiliary Energy Consumption</u>	<u>%</u>	3	1

53. The petitioner in its affidavit dated 15.2.2006 has submitted the auditors certificate regarding price and GCV of fuels. The following table indicates the prices and GCV of the fuel furnished in the affidavit dated 15.2.2006 based on auditor's certificate and those adopted in the calculations for Base Energy Charges-

<u>Description</u>	<u>Furnished vide affidavit dated 15.2.2006</u>	<u>As adopted</u>
<u>Gas price (Rs./1000 SCM)</u>	3974.10	3974.10
<u>Gas GCV (kcal/SCM)</u>	9115.05	9115.05
<u>Naphtha price (Rs./MT)</u>	19470.34	19470.34
<u>GCV of Naphtha (Kcal/kg)</u>	11311.23	11311.23

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

<u>Description</u>	<u>Unit</u>	<u>Combined Cycle</u>
<u>Rate of Energy Charge ex-bus per kWh sent (Gas)</u>	<u>Paise/ /kWh</u>	94.390
<u>Rate of Energy Charge ex-bus per kWh sent (Naphtha)</u>	<u>Paise/ /kWh</u>	372.659

55. The Base Energy Charges have been calculated on base value of GCV, base price of fuel and normative operating parameters as indicated in the above table and are subject to fuel price adjustment. The 2004 regulations provide for fuel price adjustment for variation in fuel price and GCV of fuels. Accordingly, the base energy charges approved shall be subject to adjustment. The formula applicable for fuel price adjustment shall be as given below: -

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

Where,

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

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

AC_n = Normative Auxiliary Consumption in percentage

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

K_m = Weighted average gross calorific value of Gas or Liquid fuel for the
month in Kcal/ SCM or kCal/ Litre or kCal/ Kg

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

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

56. FPA shall further be subjected to adjustment for monthly operating pattern adjustment (MOPA) for percentage open cycle operation as certified by REB/SLDC

and corresponding to Gross Station Heat Rate of 3010 kCal/kWh and auxiliary energy consumption of 1%, as per formula given below:

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

Where,

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

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

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

SHR_{no} - Normative Gross Station Heat Rate for Open cycle operation expressed in kCal/kWh (3045 kCal/kWh)

SHR_{nc} - Normative Gross Station Heat Rate for Combined cycle operation expressed in kCal/kWh (2100 kCal/kWh)

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

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

POCM - Open cycle generation during the month in percentage

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

Impact of additional capitalization for the years 2001-04

58. In Petition No 176/2004 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 1st April of the financial year following the financial year to which additional capital expenditure relates.

59. Based on the above, the impact of additional capitalisation during the period 2001-04 works out as under:

(Rs. in lakh)

		2001-02	2002-03	2003-04	Total
Period		1.00	1.00	1.00	
Additional Capitalisation		66.76	150.59	108.96	326.31
Financing of Additional Capitalisation					
Notional Loan		33.38	75.30	54.48	163.16
Notional Equity		33.38	75.30	54.48	163.16
Total					
Effective Additional Capitalisation					
Opening Loan Balance		0.00	33.38	108.68	
Addition of Loan		33.38	75.30	54.48	163.16
Repayment of Loan		0.00	0.00	0.00	0.00
Closing Loan Balance		33.38	108.68	163.16	
Effective Loan			33.38	108.68	
Weighted Average Rate of Interest on Loan			6.1215%	8.0800%	
Effective Equity			33.38	108.68	
Interest on Loan			2.04	8.78	10.82
Return on Equity	16%		5.34	17.39	22.73
Impact of Additional Capitalisation			7.38	26.17	33.55

60. The petitioner shall recover the interest on loan and return on equity on account of additional capitalization as computed above from the respondents.

61. The petitioner has vide its affidavit dated 10.3.2006, sought approval for the reimbursement of expenditure of Rs. 3,36,734.00/- 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.

62. 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.

63. 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.

64. This order disposes of Petition No 164/2004 and IA. No. 49/2005.

Sd/-	Sd/-	Sd/-	Sd/-
<u>(A.H. JUNG)</u>	<u>(BHANU BHUSHAN)</u>	<u>(K.N. SINHA)</u>	<u>(ASHOK BASU)</u>
<u>MEMBER</u>	<u>MEMBER</u>	<u>MEMBER</u>	<u>CHAIRPERSON</u>

New Delhi dated the 9th May 2006

Summary Sheet			
Company:		NTPC Ltd.	
Power Station:		AURAIYA GPS	
Petition No.		164/2004	
I.A.No.		49/2005	
Tariff Setting Period		2004-09	
			(Rs.in lakh)
1	Capital Cost of the Project as on 31.3.2001		72415
2	Additional Capitalisation(works)		326
	2001-02		67
	2002-03		151
	2003-04		109
	Total		326
3	Additional Capitalisation(FERV)		1214
	2001-02		-288
	2002-03		1501
	2003-04		0.00
	Total		1214
4	Total Capital Cost as on 1.4.2004(1+2+3)		73955
5	Means of Finance¹ :		
	Debt	50.00%	36977
	Equity	50.00%	36977
	Total	100.00%	73955
6	Normative Loan as on 1.4.2004		1476
	Normative loan O/S as on 31.3.2004		706
	Normative loan due to ACE+FERV in 2001-04		770
	Total Normative Loan as on 1.4.2004		1476
7	Cumulative Repayment upto 31.3.2009 :		36977
	Repaid upto 31.3.2004		35501
	From 1.4.2001 to 31.3.2004 (ACE & FERV)		0.00
	From 1.4.2004 to 31.3.2009		1476
	Total		36977
8	Balance Normative Loan to be repaid beyond 31.3.2009 :		0
9	Depreciation recovered upto 31.3.2009 :		65664
		Dep	AAD
			Total
	Recovered upto 31.3.2004	62702	0 62702
	From 1.4.2001 to 31.3.2004 (ACE & FERV)	82	0 82
	From 1.4.2004 to 31.3.2009	2908	0 2908
	Adj.of Cum.Dep.due to decapitalisation	(-)28	0 (-)28
	Total		65664
10	Balance Depreciation to be recovered beyond 31.3.2009 :		0
	Capital cost for the purpose of Depreciation		72415
	ACE + FERV		1540
	Capital cost as 01.04.2004		73955
	Less: Land Cost		994
			72960
	90% of Capital Cost as above		65664
	Cum. Depreciation to be recovered upto 31.3.2009		65664
	Balance Depreciation to be recovered beyond 31.3.2009		0