CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Coram

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

Petition No 40/2004

In the matter of

Approval of tariff in respect of Badarpur Thermal Power Station, New Delhi for the period from 1.4.2004 to 31.3.2009.

And in the matter of

National Thermal Power Corporation Ltd. **……Petitioner**

Vs

Delhi Transco Ltd, New Delhi ..**Respondent**

The following were present

1. Shri V.B.K. Jain, NTPC
2. Shri S.D. Jha, NTPC
3. Shri Manoj Saxena, NTPC
4. Shri Shankar Saran, NTPC
5. Ms Pranav Kapoor, NTPC
6. Shri R. Chhabra, NTPC
7. Shri A. Basu Roy, NTPC
8. Shri V.K. Gupta, Consultant, DTL
9. Shri M.P. Aggarwal, DTL
10. Shri V.K. Garg, DTL
11. Shri S.R. Sethi, DTL
12. Shri V.K. Malhotra, DTL

ORDER
(DATE OF HEARING: 14.9.2005)

This petition has been filed by the petitioner, a generating company owned or controlled by the Central Government on behalf of that Government for approval of tariff in respect of Badarpur Thermal Power Station, New Delhi (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 present capacity of 705 MW comprises of five units, three units of 95 MW (original rating = 100 MW) each and two units of 210 MW each. The first unit of the generating station was declared under commercial operation on 1.11.1973 and the fifth unit on 1.4.1982. The generating station was conceived by Government of India in the year 1967 for meeting the growing demand of power in Northern Region. However, since 1987, the entire power generated from the generating station is being utilized for meeting the demand of Delhi.

3. The Central Government in Ministry of Energy, Department of Power decided the tariff for the generating station vide letter No.49/16/82-D7/AS dated 17.3.1987 applicable from 1.4.1987 and was not revised thereafter. The base tariff was fixed at 61.38 paise per unit, exclusive of excise duty and other taxes, which were to be paid additionally. The base tariff was computed corresponding to energy sent out of 3168 MUs at 57.08% normative PLF for the rated capacity of the generating station of 720 MW considering 12% auxiliary energy consumption. The break up of base tariff of 61.38 paise/kWh was as follows:

Sl. No.	Description	Rs. in crore (annual)	Paise/kWh of sent out energy
(a)	Fixed Charges:		
(i)	Interest on fixed capital @ 8.5% on net worth as on 1.4.87 of Rs.196.62 crore.	16.71	5.28
(ii)	Interest on working capital.	4.19	1.32
(iii)	Depreciation @ 3.6% on gross block of Rs. 255 crore.	9.18	2.90
(iv)	O&M cost @ 2.5% of current capital cost of Rs. 11100 per kW.	19.98	6.31
(v)	Standard profit @ 3% of net worth as on 1.4.1987 of Rs. 196.62 crore.	5.90	1.86
	Total	55.96	17.67
(b)	Energy Charges		
(i)	Coal cost	112.66	35.54
(ii)	Oil cost	25.82	8.17
	Total	138.48	43.71
	Grand Total	**194.44**	**61.38**

4. The fixed charges were computed on Net Fixed Asset concept. The energy charges were based on the following operational parameters and price of GCV of fuels, namely:

(a) Station heat rate — 3189 kCal/kWh,

(b) Specific Fuel oil consumption — 22.5 ml/kWh (21 ml/kWh of furnace oil and 1.5 ml/kWh of HSD),

(c) Auxiliary energy consumption — 12%,

(d) Prices and GCV of coal and oil

Coal : GCV - 4280 kcal/kg
Price - Rs.451.90 per MT

Oil : GCV - 10000 kcal/litre
Price - Rs.3188/kl

5. The tariff for sale of electricity from the generating station has not been revised by the Central Government since March 1987. It implies that fixed charge recovery has been at 17.67 paise/kWh since 1987. The energy charge were subjected to fuel price adjustment as per specified formula.

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

(Rs. in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Interest on Loan	2182	2407	2804	2982	2846
Depreciation	1293	1848	2777	3575	4024
Advance against Depreciation	901	828	616	384	231
Return on Equity	3072	3746	4750	5542	5956
O & M Expenses	19294	20066	20868	21703	22571
Interest on Working Capital	3273	3319	3380	3431	3465
TOTAL	**30015**	**32214**	**35195**	**37617**	**39093**

7. 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
Spares	2468	2468	2468	2468	2468
O & M expenses	1608	1672	1739	1809	1881
Receivables	15686	16052	16549	16952	17198
Rate of Interest	10.75%	10.75%	10.75%	10.75%	10.75%
Interest on Working capital	**3273**	**3319**	**3380**	**3431**	**3465**

8. In addition, the petitioner has claimed energy charges @ 168.5 paise/kWh.

9. The reply to the petition was filed by the respondent. The petitioner has published notices in accordance with the procedure specified by the Commission. However, no objections or suggestions have been received in response to these notices.

10. The tariff for the generating station for the period up to 31.3.2004 was not determined by the Commission, and the tariff earlier fixed by the Central Government by letter dated 17.3.1987 was continuing. In view of the unique features of the generating station and its history of tariff determination, the Commission in its order dated 29.3.2004 in Petition No.67/2003 (suo motu) had decided that the norms and terms and conditions of tariff for the generating station would be prescribed separately since the tariff for the generating station could not be determined by applying the general terms and conditions contained in the 2004 regulations in toto. The Commission's intention as contained in the order dated 29.3.2004 was translated into proviso to Regulation 2(2) of the 2004 regulations. In order to meet the twin objectives of protection of consumers' interest and giving weightage to the commercial principles, the Commission had constituted a one-Member bench with Shri A.H. Jung as the Presiding Member to make appropriate recommendations to the Commission on the following specific issues:

(a) Whether to follow the "Net Fixed Assets" approach or "Gross Fixed Assets" approach:

(b) Debt-equity ratio to be considered;

(c) Gross block to be considered as on 1.4.2004;

(d) R & M expenditure and the expenditure to meet environmental norms to be considered;

(d) O & M expenses to be considered in tariff; and

(e) Operational norms of gross station heat rate, auxiliary energy consumption, specific fuel oil consumption and target availability/PLF to be applicable.

11. The one-Member Bench submitted its report to the Commission, which was circulated to the parties for their comments. The recommendations of the one-Member Bench and the views of the parties concerned thereon will be considered at appropriate places.

12. Another matter that needs to be noticed at this stage is that by order dated 10.3.2005 of the Commission, this station was brought within the purview of ABT with effect from 1.4.2005. As the tariff was earlier being charged on single-part basis according to Department of Power, Government of India letter dated 17.3.1987, and the generating station needed to be operated on two-part tariff to facilitate smooth implementation of ABT, the Commission vide order dated 1.4.2005 allowed the following provisional two-part tariff to be charged from 1.4.2005 subject to adjustment on finalization of tariff:

(a) Annual fixed charges - Rs.220.00 Crore

(b) Energy charge - Rs.158.87 paise/kWh of energy sent out

GROSS FIXED ASSETS APPROACH VS NET FIXED ASSETS APPROACH

13. The one-Member Bench has recommended NFA approach for tariff determination, since the Central Government had notified tariff in 1987 based on Net Fixed Asset (NFA) concept. The one-Member Bench noted that the generating

station is in operation since November 1973 and its different units have operated for 24 to 33 years and have already served for their rated life. As in the case of the tariff setting for generating stations belonging to NLC, the Commission prefers continuity in tariff setting approach and would not like to disturb it, except for compelling reasons.

14. The petitioner has pleaded adoption of GFA concept. The petitioner has submitted that grounds considered by the one-Member Bench, recommending adoption of NFA concept in the tariff determination are not in conformity with the Commission's views on the issue. The petitioner has submitted that the Commission in its order dated 21.12.2000 has without going into the question of life of the generating station has decided to adopt GFA concept to incentivise investors. On the question of preference for continuity in tariff setting the petitioner has submitted that NFA concept, in case of NLC's lignite-based stations was adopted because there was mutual agreement between the parties. But there is no agreement to that effect between the parties in the present case. Further, according to the petitioner, there are compelling reasons for adoption of GFA concept since Clause (b) of section 61 of Electricity Act, 2003 emphasises on generation of electricity on commercial principles. Adoption of NFA approach was acceptable to the respondent.

15. The generating station was set up and has been owned by the Government of India. (NTPC has been managing it since 1.4.1978, under an agreement with the Government of India dated 12.4.1978). The tariff was determined and notified by Government of India, the owner, on 17.3.1987, on NFA basis. There is no reason for

changing at this stage the tariff to GFA basis, which is comparatively disadvantageous for the respondent, the sole beneficiary in this case.

16. The arguments of the petitioner are not convincing. The generating station is in operation for about 33 years and tariff is being charged on NFA concept since its commissioning. Therefore, it cannot be held that there was no agreement between the parties. Further, it could not be held that NFA approach is against the commercial principles. Accordingly, we have accepted the recommendation of the one-Member Bench to adopt NFA concept for tariff determination.

CAPITAL COST

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

18. The petitioner has claimed the following opening and closing gross blocks in the respective year of tariff period after considering anticipated additional capitalisation:

(Rs. in crore)

Period	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Opening Capital Cost	414.87	462.76	607.54	749.50	834.05
Additional capitalization	47.89	144.78	141.96	84.55	33.73
Closing Capital Cost	**462.76**	**607.54**	**749.50**	**834.05**	**867.78**

19. The opening capital cost of Rs. 414.87 Crore as on 1.4.2004 is the sum of the audited gross block as on 31.3.2003 of Rs. 410.64 Crore and an anticipated expenditure of Rs.4.23 Crore for the year 2003-04. According to the petitioner, as per the audited balance sheet for the year 2003-04 the gross block as on 31.3.2004 is Rs. 430.76 Crore. As such, there is an actual additional capitalisation of Rs. 20.12

Crore in 2003-04. While specifying the tariff for the generating station with effect from 1.4.1987 vide its communication dated 17.3.1987, the Government of India had stated the "gross block" as Rs.255 crore, and "net worth" of the station on 1.4.1987 as Rs.196.62 crore. The petitioner has stated that additional expenditure has been incurred on R&M Phase-I (Rs.36.97 crore), SFC-I (Rs.24.70 crore), SFC-II (Rs.14.91 crore) and SFC-III (Rs.14.95 crore) which add up to Rs.91.53 crore. The petitioner has also furnished details of further capital expenditure of Rs.95.49 crore, which consist of expenditure related to ash pond and construction of ash dyke, augmentation of fire protection system and condenser cooling system. Starting from the gross block figure of Rs.255 crore stated by the Central Government in 1987, one would arrive at a gross block of Rs.442.02 crore, which is higher than the gross block of Rs.430.76 crore as on 31.3.2004, as per petitioner's books of accounts.

20. The one-Member Bench, therefore, has recommended to consider the actual capital expenditure of Rs.430.76 crore as on 31.3.2004, that is, the gross fixed assets as per the balance sheet for the year 2003-04. By following this, the one-Member Bench has arrived at the net fixed asset of Rs. 229.78 crore as on 31.3.2004, after deducting cumulative depreciation of Rs.200.98 crore recovered up to 31.3.2004 as indicated by the petitioner. The one-Member Bench has observed that any additional capitalisation can be allowed in the capital base after the expenditure is actually incurred and the anticipated additional capitalisation indicated by the petitioner should not be considered for the determination of tariff with effect from 1.4.2004.

Deferred Revenue Expenditure

21. The petitioner had sought determination of O&M expenses norms based on actual expenditure for the years 1998-99 to 2002-03, which included an expenditure of Rs. 3731 lakh under the head 'Deferred Revenue Expenditure' . This expenditure has not been considered by the one-Member Bench for recommending O&M expenses norms on the ground that the expenditure is not of recurring nature and there is no possibility of similar expenditure being incurred during the tariff period.

22. Therefore, the petitioner has made an additional plea with regard to capitalization of deferred revenue expenditure of Rs.3731 lakh for the purpose of tariff, since the same has not been considered for the purpose of normalisatiton of O&M expenses by the one-Member Bench. The petitioner has submitted that expenditure be either charged to Profit and Loss account or should be capitalized. The petitioner had therefore, requested that since deferred revenue expenditure has been not been considered for the purpose of normalisation of O&M expenses, it should be added to the fixed assets, otherwise this expenditure would always remain un-serviced. The petitioner has explained that this expenditure was claimed as O&M expenditure as the Auditor did not allow it to be capitalised because this expenditure was not meant for creation of additional capacity.

23. We have considered the submission. The deferred revenue expenditure was claimed through O&M expenses. We agree with the recommendation of the one-Member Bench that since the expenditure is not of recurring nature, it cannot be claimed through O&M charges. However, as the expenditure has been incurred on the generating station and is considered reasonable by the Commission, it has been allowed to be capitalised and included in the gross block.

24. The respondent has pointed out that the additional capitalisation should be allowed only after deducting the gross asset value of assets replaced. This practice has been followed in the case of other generating stations belonging to the petitioner. In this particular case, additional capitalisation has to be dealt from 1987. Out of additional capitalisation of Rs.18702 lakh since March 1987 an expenditure of about Rs. 9549 lakh relates to creation of new assets on ash pond and construction of ash dyke, augmentation of fire protection system and condenser cooling system not requiring replacement of asset. The balance of Rs.9153 lakh is on R&M Phase-I (Rs. 3697 lakh) and replacement & repair works under taken under SFC-I, II& III (Rs. 5456 lakh) involving replacement of assets. The R&M phase-I was approved in March, 1993 and SFC-I, II & III were approved in November, 1998, June, 2000 and March 2002 respectively. Having regard to the vintage of different units and escalation in prices of power plant equipment, the original prices of the assets replaced are expected to be of the order of 10-12% of the cost of new assets. Since the tariff was determined based on NFA concept the value of depreciated assets as on 1.4.2004 is likely to be insignificant and does not appear to be worth the effort required to be put in culling out the details of assets replaced for about 17 years.

25. In view of above, it would be reasonable to accept the opening capital cost of Rs.46807 lakh as on 1.4.2004 as per details given below:

(Rs in lakh)

Capital Expenditure up to 31.3.2004 (Gross Block as per Books of Account for the year 2003-04)	43076.00
Deferred Revenue expenditure 1999-00 to 2002-03	3731.00
Capital Expenditure up to 31.3.2004 including deferred revenue expenditure	46807.00
Capital Cost as on 1.4.2004 for the purpose of tariff	**46807.00**

26. The corresponding opening net block of Rs.26709 lakh has been considered for the purpose of tariff.

(Rs in lakh)

Net Fixed Asset as on 1.4.2004	22978.00
Deferred Revenue Expenditure	3731.00
Net Fixed Asset, including Deferred Revenue Expenditure	**26709.00**

<u>DEBT-EQUITY RATIO</u>

27. 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.

28. The tariff for the generating station for the period ending 31.3.2004 was not determined by the Commission. Therefore, the matter needed to be considered on its own merits. This issue was referred to the one-Member Bench .

29. Initially, the petitioner filed the petition for approval of tariff based on debt-equity ratio of 70:30. Subsequently, an amended petition has been filed wherein tariff has been proposed by taking debt-equity in the ratio of 50:50.

30. The one-Member Bench has agreed with the revised proposal of the petitioner on this issue and has recommended debt-equity ratio of 50:50 for the purpose of tariff.

31. The respondent has submitted that the original petition envisaged a debt:-equity ratio of 70:30 and the same should be adopted for the purpose of tariff.

32. We have carefully considered the recommendation made by the one-Member Bench and the objection of the respondent. Prior to the constitution of the Commission the tariff for the generating stations owned by the petitioner was notified by the Central Government by taking normative debt-equity ratio of 50:50. In case of this generating station this ratio was not applied since the entire funding was by the Central Government. However, by adopting the principle earlier considered by the Central Government, we have decided to consider debt-equity ratio of 50:50. Applying this ratio to the capital cost as on 1.4.2004, the notional equity has been determined as Rs.2340 lakh, as on 1.4.2004.

TARGET AVAILABILITY/PLF

33. The petitioner has considered target availability and PLF of 70%. The respondent on the other hand has submitted that the generating station has earned Rs.567 lakh during the period 1.4.2005 to 24.7.2005 and has achieved average PLF of 89.7% during this period. Therefore, respondent has sought a norm of 80% as specified in the 2004 regulations.

34. The one-Member Bench has observed the generating station is supplying power to National Capital Territory of Delhi and was not under ABT till 31.3.2005. The historical performance data is for pre-ABT period, when the generating station used to generate to the maximum capacity, irrespective of grid frequency and there was no penalty for not meeting the declared availability. After implementation of availability based tariff w.e.f. 1.4.2005, the generating station is required to declare availability on day ahead basis and there is penalty for generating less than the schedule when the frequency is below 50 Hz. Considering the age and size of Units, the one-Member

Bench has recommended fixing target availability and PLF at 75%. On consideration of the analysis of the situation made by the one-Member Bench, target availability/PLF of 75 % 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

35. As per the methodology under NFA approach, return would be provided on constant equity component till the loans are fully paid, and once loans are fully repaid subsequent depreciation recovery would be utilized towards notional reduction in equity. In other words, return on equity would be calculated on reducing equity base once the loan is fully repaid notionally.

36. Accordingly, return on equity has been worked out on the notional equity which would be reducing to the extent of depreciation recovery from 2006-07 onwards once the loan amount is fully paid off. The calculation of return on equity for the tariff period 2004-09 is given in the table as under :-

(Rs. in lakh)

Sl.No.	Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
1.	Notional equity opening	23403	23403	23403	22031	20471
2.	Depreciation amount utilized for reduction of equity	0	0	1373	1559	1559
3.	Notional equity closing	23403	23403	22031	20471	18912
4.	Average notional equity	23403	23403	22717	21251	19692
5.	Rate of return on equity	14%	14%	14%	14%	14%
6.	Return on equity	3276	3276	3180	2975	2757

INTEREST ON LOAN

37. Under NFA approach, entire depreciation amount would first be utilized for repayment of loan. Once the loan is paid off, subsequent depreciation recovery would be utilized towards notional reduction of equity component. As per the audited accounts submitted by the petitioner, the cumulative depreciation recovery as on 31st March, 2004 is Rs.20098 lakhs. Accordingly, balance notional loan as on 1.4.2004 is Rs.3305 lakhs out of the gross notional loan of Rs.23403 lakhs. The rate of interest for the period 2004-09 on outstanding notional loan is considered as 10.5% as per the claim of the petitioner in the IA. The depreciation amount is considered as repayment till the entire loan is repaid.

(Rs. in lakh)

Sl.No.	Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
1.	Net notional loan - opening	3305	1746	187	00	00
2.	Repayment	1559	1559	187	00	00
3.	Net notional loan - closing	1746	187	00	00	00
4.	Average notional loan	2526	966	93	00	00
5.	Rate of interest	10.5%	10.5%	10.5%	10.5%	10.5%
6	Interest on notional loan	265	101	10	00	00

DEPRECIATION

38. 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.

39. The petitioner has submitted list of assets (31 items) with total gross block of Rs.43076 lakh and has calculated the weighted average rate of depreciation of 3.55%. The petitioner's claim has been scrutinized in the light of depreciation rates specified in the 2004 regulations dated 26.03.04. The following observations are made:.

(i) Certain assets viz. Fire fighting system, Other electrical installations, workshop machinery, Laboratory equipment, construction machinery & equipment, dispensary / hospital equipment & cycles amounting to Rs.858.92 lakh are included in the gross block and have been depreciated @ 11.25 % by the petitioner. Since no rates have been specified for these assets in appendix-II to the 2004 regulations, taking reasonable life of the said assets as 15 years rate considered in calculation is 6% as applicable to similar category of assets.

(ii) In the gross block the petitioner has shown an amount of Rs.14.91 lakh as expenditure on assets not owned by the company and have depreciated the same @ 25 %. Details of the assets are not available. Presuming these assets to be of the nature of Civil works the rate of depreciation considered is 1.80 %.

(iii) An amount of Rs.4.32 lakh is shown as plant & machinery, loose tools & scientific equipment and the same has been depreciated by the petitioner @ 100 %. Since the break up of above amount under the three heads is not available depreciation rate of 3.6 % applicable to plant & machinery is considered.

(iv) An amount of Rs.420.77 lakh is included in above Gross block under the head Satellite Communication system & EDP machines. Rate of depreciation considered by the petitioner for the same is @ 30%. As per appendix-II, rate of depreciation for communication systems is 6% .In absence of cost of EDP machine & communication system average rate of depreciation for the two considered is 18%.

(v) To the above gross block an amount of Rs. 3731 akh (Deferred revenue expenditure) is to be added to arrive at the gross block of Rs.46807 lakh. Depreciation rate considered is @ 3.6% since most of the items covered in this amount are Boiler, turbine parts.

40. On the basis of above, weighted average rate of depreciation works out to 3.33 % against 3.55 % claimed by the petitioner. All calculations have been carried out with weighted average rate of depreciation as 3.33 %.

41. Accordingly, for the period 1.4.2004 to 31.3.2009 the depreciation works out to Rs. 1559 lakh each year by applying rate of depreciation of 3.33% as shown below:

(Rs. in lakh)

Details of Depreciation	2004-05	2005-06	2006-07	2007-08	2008-09
Gross Block - Opening	46807	46807	46807	46807	46807
Additions	0	0	0	0	0
Gross Block - Closing	46807	46807	46807	46807	46807
Average Gross Block	46807	46807	46807	46807	46807
Rate of Depreciation	3.33%	3.33%	3.33%	3.33%	3.33%
Depreciable Value	37451	37451	37451	37451	37451
Balance Useful life of the asset					
Remaining Depreciable Value	17353	15794	14235	12675	11116
Depreciation	**1559**	**1559**	**1559**	**1559**	**1559**

ADVANCE AGAINST DEPRECIATION

42. 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

43. 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.

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

O&M EXPENSES

45. The petitioner has claimed the following O&M expenses for the period 2004-05 to 2008-09 based on actual expenses for the period 1998-99 to 2002-03:

	2004-05	2005-06	2006-07	2007-08	2008-09
O&M Expenses (Rs. in crore)	192.94	200.66	208.69	217.04	225.72
O&M Expenses (Rs. in lakh /MW)	27.37	28.46	29.60	30.78	32.01

46. The 2004 regulations have specified normative O&M expenses for different types of thermal generating stations. However, O&M expenses norms have not been laid down for the generating station as previous years data in respect of the generating station was not made available when the 2004 regulations were being specified. Therefore, the question was referred to the one-Member Bench for study and report.

47. The one-Member Bench after the detailed study of the actual expenses for the years 1998-99 to 2002-03, noted that O&M expenses are fairly constant during three-year period from 2000-01 to 2002-03 and felt the need to trim O&M expenses from point of view of economy in the cost of supply to the respondent. At the same time, the one-Member Bench noted that reduction could be brought about only gradually under the given circumstances. Therefore, the one-Member Bench recommended that O&M expenses of the order of Rs. 20.25 lakh/MW may be considered, without escalation during the tariff period. As such, an amount of Rs. 142.75 crore per year was recommended during the tariff period.

48. The petitioner has pleaded for providing escalation in O&M expenses on year-to-year basis as in other generating stations. The petitioner has further submitted that it would be required to offer VRS for the employees to meet O&M and may be allowed to reimburse expenditure on VRS on actuals or liberty may be granted to approach the Commission if O&M expenses exceed on account of VRS payments. The respondent has submitted that VRS is done only when it has either no effect on tariff or it is economical meaning that tariff reduces.

49. The intent of the process of normalisation is to consider only that expenditure, which is of recurring nature with a view to prescribing norm for the future. As such, one-time expenditure made under specific conditions without any likelihood of being incurred during the tariff period is excluded. The deferred revenue expenditure and prior period adjustments falling under this category are rightly deducted for prescribing norm of O&M expenses by the one-Member Bench. The escalation in O&M is not being allowed through a conscious decision considering scope for reduction in O&M expenses.

50. The one-Member Bench has recommended allowing the existing level of O&M of the order of Rs.20.25 lakh/MW amounting to Rs.142.75 crore /year for the next five years of tariff. This is without any escalation on year to year basis and in order to give time to the petitioner to bring down expenditure on operation and maintenance of the generating station gradually. This is considered reasonable in the given circumstances. We therefore, agree with the recommendations of the one-Member Bench.

51. 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.

52. Based on above discussion, we allow an amount of Rs. 14275 lakh per year as O&M expenses for the generating station as recommended by the one-Member Bench.

INTEREST ON WORKING CAPITAL

53. 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.

54. 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.

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

(a) **Coal stock**: The coal stock has been worked out for two months on the basis of operational parameters decided in the present petition. The fuel cost allowed in working capital is given hereunder:

	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Weighted Avg. GCV of Coal (kCal/kg)	4400	4400	4400	4400	4400
Heat Contribution by Coal (kCal/kwh)	2859	2859	2859	2859	2859
Specific Coal Consumption (kg/kwh)	0.65	0.65	0.65	0.65	0.65
Annual Requirement of Coal (MT)	3009650	3009650	3009650	3017895	3009650
Coal Stock (2 months) (MT)	501608.3	501608.3	501608.3	502983	501608.3
Weighted Avg. Price of Coal (Rs./MT)	2191.52	2191.52	2191.52	2191.52	2191.52
Coal Stock-2 months- (Rs. in lakh)	10993	10993	10993	11023	10993

(b) **Oil Stock**: The oil stock for 2 months as per the operational parameters decided based on the recommendations of the one-Member Bench and weighted average price of oil 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.)	10000	10000	10000	10000	10000
Heat Contribution by Oil (kcal/kWh)	26	26	26	26	26
Annual Requirement of Oil (ltrs)	12042810	12042810	12042810	12075804	12042810
Oil Stock(2 Months) (KL)	2007	2007	2007	2013	2007
Weighted Avg. Price of Oil (Rs./KL)	18087.55	18087.55	18087.55	18087.55	18087.55
Oil Stock-2 Months- (Rs. in lakh)	363	363	363	364	363

(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 spares requirement has been worked out by us based on the capital cost of Rs. 13214 lakh as on 1.4.1982 as given by the petitioner in the IA filed. 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. 476 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)	1.6000	1.6000	1.6000	1.6000	1.6000
Oil (Rs/kWh)	0.0528	0.0528	0.0528	0.0528	0.0528
Rs./kWh	1.6528	1.6528	1.6528	1.6528	1.6528
Variable Charges per year	68135	68135	68135	68322	68135
Variable Charges -2 months (Rs in lakh)	11356	11356	11356	11387	11356
Fixed Charges - 2 months (Rs in lakh)	3709	3682	3651	3616	3578
Receivables (Rs in lakh)	15065	15038	15006	15003	14934

56. 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.

57. 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 – 2 months	10993	10993	10993	11023	10993
Oil stock – 2 months	363	363	363	364	363
O & M expenses	1190	1190	1190	1190	1190
Spares	476	505	535	567	601
Receivables	15065	15038	15006	15003	14934
Total Working Capital	28087	28088	28087	28146	28081
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on Working Capital	2879	2879	2879	2885	2878

ANNUAL FIXED CHARGES

58. 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)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Interest on Loan	265	101	10	0	0
Depreciation	1559	1559	1559	1559	1559
Advance Against Depreciation	0	0	0	0	0
Return on Equity	3276	3276	3180	2975	2757
O & M Expenses	14275	14275	14275	14275	14275
Interest on Working Capital	2879	2879	2879	2885	2878
TOTAL	**22255**	**22091**	**21903**	**21694**	**21469**

<u>OPERATIONAL NORMS OTHER THAN TARGET AVAILABILITY/PLF</u>

59. The norms of operation of the generating stations have been specified in the 2004 regulations for consideration for determination of tariff fir the period 1.4.2004 to 31.3.2009; expect the generating station the subject matter of the present petition.

60. The petitioner has claimed tariff by considering the operational norms as follows:

	As claimed
Gross Station Heat Rate (Kcal/kWh)	2885.00
Auxiliary Energy Consumption (%)	12.00
Specific fuel oil consumption (ml/kWh)	3.50

61. The question of determination of appropriate operational norms was included in the terms of reference to the one-Member Bench who has recommended the following norms, namely:

	As Recommended
Gross Station Heat Rate (Kcal/kWh)	2885
Auxiliary Energy Consumption (%)	11%
Specific fuel oil consumption (ml/kWh)	2.60

Gross Station Heat Rate

62. The respondent has submitted that station heat rate norm should be specified based on norm for 210 MW sets decided by the Commission for other generating stations of 2500 kCal/kWh and norms for Tanda TPS for 110 MW sets of 3000 kCal/kWh. Accordingly, it has sought station heat rate norm of 2720 kCal/kWh. The contentions of the respondent may hold good for the units which have not completed their rated life. However, in the present case, the units of 95 MW have already outlived their rated life and the units of 210 MW are nearing completion of their rated life. As such it would not be reasonable to apply station heat rate norms applicable to the rated life of the generating station. The recommendation of the one-Member Bench on the station heat rate norm of 2885 kCal/kWh based on actuals is considered to be reasonable and has been accepted.

Auxiliary Energy Consumption

63. The petitioner has reiterated that norm of auxiliary energy consumption be fixed as 12%. The respondent on the other hand has submitted that the norms as notified by the Commission in the 2004 regulations should only be considered without any deviation. The respondent has not worked out the detailed basis for its claim. Based on AEC of 9% for 210 MW sets and 11% for 95 MW sets (Based for norm of Tanda TPS), AEC for the generating station is worked out as 9.81%. Here also the contention of the respondent holds good for the units which have not completed their rated life. However, in this particular case the units of 95 MW has outlived their rated life and units of 210 MW are nearing completion of their rated life. As such, the one-Member Bench recommendation on the auxiliary energy consumption norms of 11% based on actuals has been accepted.

Specific fuel oil consumption

64. The petitioner has reiterated that norm of specific fuel oil consumption be fixed at 3.5 ml/kWh. The respondent has submitted that the norm of 2.6 ml/kWh recommended by the one-Member Bench is on the higher side when against backdrop of the actual average specific fuel oil consumption of 0.55 ml/kWh. According to the respondent there is no justification for allowing higher norm. Since the actual specific fuel oil consumption is much less than specific fuel oil consumption norm for similar units during their rated life, the one-Member Bench has not recommended norm of specific fuel oil consumption norms based on actuals. The recommended norm of 2.6 ml/kWh is based on norm for similar units during their rated life as per the 2004 regulations and is considered reasonable. Accordingly, the one-Member Bench recommendation has been accepted.

65. The actual performance of the generating station during 2005-06 and 2006-07 (post-ABT) would be watched and the norms in respect of target availability/PLF station heat rate and fuel oil consumption may be revised with effect from 1.4.2007 or thereafter if so warranted. The petitioner is directed to furnish the quarterly operational parameters achieved for the year 2005-06 and 2006-07 on regular basis.

ENERGY/VARIABLE CHARGES

66. The petitioner has claimed energy charges @ 168.5 paise/kWh based on the operational norms considered by it.

67. The Base Energy Charges (BEC) computed based on the operational norms approved are summarised below:

Computation of Energy Charges

Description	Unit	As considered
Capacity	MW	705.00
Gross Station Heat Rate	kCal/kWh	2885.00
Specific Fuel Oil Consumption	Ml/kWh	2.60
Aux. Energy Consumption	%	11.00
Weighted Average GCV of Oil	kCal/l	10000.00
Weighted Average GCV of Coal	kCal/Kg	4400.00
Weighted Average Price of Oil		18087.55
Weighted Average Price of Coal	Rs./MT	2191.52
Rate of Energy Charge ex-bus per kWh Sent	**Paise/kWh**	**165.28**

68. 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 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: -

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,

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

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

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

69. The petitioner has sought approval for the reimbursement of expenditure of Rs. 32,408/- 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 order dated 1.4.2005. The provisional billing of tariff shall be adjusted in the light of final tariff now approved by us.

R&M AND EXPENDITURE TO MEET ENVIRONMENTAL NORMS

72. The petitioner had requested for the approval of R&M expenditure of Rs.452 crore at price level of 2003 involving R&M of Stage-I & Stage -II. The respondent, however does favour the status quo for the units of Stage-I in current tariff period and their phasing out only in a gradual manner. The one-Member Bench however felt that, advance action on feasibility study, firming up schedule of implementation, and funding shall have to be initiated immediately. The petitioner, however, submitted that it did not have any incentive to infuse any fresh investment on R&M, if NFA concept was adopted for tariff setting, because there were other avenues available for investment in green field projects where tariff was allowed on GFA concept. With regard to fresh investment on setting up of a new capacity of 250 MW with better efficiency, to replace 35 years old inefficient Stage-I units, the one-Member Bench felt that the same could be serviced on GFA approach. This should be motivation enough for the petitioner to take up the above project with the seriousness it deserves. A viable and firmed up scheme in this regard should be submitted by the petitioner by December 2006. However, capital dosing of minor nature to sustain operation of Stage-I units could be allowed (subject to prudence check) until they are phased out.

73. As regards R&M of Stage-II, the petitioner has submitted that CEA has already approved an R&M expenditure of Rs.329 Crore at 2004 price level, which is likely to extend life of the generating station by about 15 years. The respondent is also not averse to R&M of Stage-II. However, the respondent has expressed a concern that timeframe of R&M along with cost benefit analysis and a commitment on extended life of the units has not been indicated. The Commission has no objection to R&M of Stage-II, in principle, in view of CEA approval, which the petitioner should place on

record. The R&M expenditure for Stage-II can be admitted after prudence check as per the usual practice of the Commission. The petitioner, for the recovery of depreciation through tariff, shall furnish the average extended life of Stage-II units from a reference date. This is, however, not relevant at this stage in this tariff determination and the details may be furnished by the petitioner while filing petition for the revision of tariff after incurring R&M expenditure.

74. This order disposes of Petition No.40 /2004.

Sd/-	Sd/-	Sd/-
(BHANU BHUSHAN)	**(K.N. SINHA)**	**(ASHOK BASU)**
MEMBER	**MEMBER**	**CHAIRPERSON**

New Delhi dated the 9th May 2006

Summary Sheet					
Name of the Company		NTPC Ltd.			
Name of the Power Station		Badarpur TPS			
Date of Commercial Operation		01.04.1982			
Tarrif setting Period		2004-09			
Petition No.		40/2004			
				Rs.in lakh	

No.	Particulars	Details	Dep	AAD	Total	Amount
1	**Capital Cost of the Project as on 31.03.2004**					**43076.00**
	Cumulative depreciation recovered as on 31.03.04					**20098.00**
2	**Admitted NFA as on 01.04.2004**					**22978.00**
3	**Additional Capitalisation(DRE) for tariff purpose**					**3731**
		For the year 1999-2000			793.52	
		For the year 2000-01			294.49	
		For the year 2001-02			1131.30	
		For the year 2002-03			1511.58	
		Total			3731	
4	**Additional Capitalisation(FERV) No:**					**0.00**
		For the year 2001-02				
		For the year 2002-03				
		For the year 2003-04				
		Total			0.00	
5	**Total NFA as on 01.04.2004(2+3+4)**					**26709**
6	**Means of Finance[1] :**					
		Debt				
		Equity				
		Total				
7	**Debt details-notional debt (Net) as on 01.04.2004**					3305.00
		Notional Debt(Gross i.e.50% of 43076+3731))			23403.00	
		Repayment upto 31.03.04			20098.00	
		Balance Debt			3305.00	
8	**Weighted Av. Rate of interest-considered**					**10.50%**
9	**Depreciation recovered upto 31.03.09 :**					
			Dep	**AAD**	**Total**	
		Recovered upto 31.03.2004	20098.00	--	20098.00	
		From 01.04.2004 to 31.03.2009	7797	0.00	7797	
		Total			27895	
10	**Balance Depreciation to be recovered beyond 31.03.2009 :**					
		Capital cost for the purpose of Depreciation[2]			**43076.00**	
		DRE			**3730.89**	
		Capital cost as 01.04.2004			**46806.89**	
		Less: Land Cost			**5194**	
		90% of Capital Cost as above			**37451**	
		Cum. Depreciation to be recovered upto 31.03.09			**27895**	
		Balance			**9557**	

1 The last tariff was set by MoE,Dept. of Power w.e.f period 01.04.1987 on NFA basis .The Gross Block as on 01.04.2004 is Rs.43076 lacs without considering Deferred Revenue Expenditure(DRE) and Rs.46807 lacs incuding DRE .Cumulative depreciation recovered upto 31.03.2004 amounting to Rs.20098 lacs is deducted to arrive at NFA as on 31.03.2004 amounting to Rs.22978 lacs. Additional Capitalisation due to Deferred Revenue Expenditure amounting Rs.3731 lacs for the period 1999-2000 to 2002-03 respectively has been added to arrive at NFA as on 1.04.2004 which works out to Rs. 26709 lacs