

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram

1. **Shri Ashok Basu, Chairman**
2. **Shri K.N.Sinha, Member**

Petition No 1/2000

In the matter of

Approval of tariff in respect of Feroze Gandhi Unchahar Thermal Power Station Stage II for the period from 1.3.2000 to 31.3.2004

And in the matter of

National Thermal Power Corporation Ltd.

.... **Petitioner**

Vs

1. Uttar Pradesh Power Cotrporation Ltd Lucknow
 2. Rajasthan Rajya Vidyut Prasaran Nigam Ltd, Jaipur
 3. Delhi Power Supply Company Ltd, New Delhi
 4. Haryana Vidyut Prasaran Nigam Ltd, Panchkula
 5. Punjab State Electricity Board, Patiala
 6. Himachal Pradesh State Electricity Board, Shimla
 7. Power Development Department, Govt of J&K, Jammu
 8. Power Department Union Territory of Chandigarh
 9. Uttranchal Power Corporation Ltd, Dehradun Faridabad
- **Respondents**

The following were present:

1. Shri Shyam Wadehra, ED(C), NTPC
2. Shri Alka Saigal, Manager (F),NTPC
3. Shri A. Sardana, NTPC
4. Shri T.R. Sohal, NTPC
5. Shri M.S. chawla, NTPC
6. Shri A.K. Poddar, NTPC
7. Shri Ajay Dua, Manager, NTPC
8. Shri S.D. Jha, Manager (Comml.), NTPC
9. Shri M.K.V. Rama Rao, DGM(OS), NTPC
10. Shri R.Singhal, NTPC
11. Shri S.K. Samui, Sr. Manager (Comml.), NTPC
12. Shri M.R.K. Rao, Sr. Manager (Law), NTPC
13. Shri T.P.S. Bawa, Superintending Engineer, PSEB
14. Shri V.K. Gupta, DCE (Comml.), RRVPNL
15. Shri S. Vashistha, RRVPNL

16. Shri D.D. Chopra, Advocate, UPPCL
17. Shri B.K. Saxena, Sr. AE, UPPCL
18. Shri T.K. Srivastava, EE, UPPCL
19. Shri R.K. Arora, XEN /T, HVPN

ORDER
(DATE OF HEARING 14-11-2002)

This petition has been filed by the petitioner, NTPC, a generating company owned by the Central Government for approval of tariff in respect of Feroze Gandhi Unchahar Thermal Power Station Stage II (hereinafter referred to as "Feroze Gandhi Unchahar TPS Stage II").

2. The techno-economic clearance for Feroze Gandhi Unchahar TPS Stage II was accorded by CEA in terms of its letter dated 21.10.1992 at a cost of Rs. 115434 lakh, including IDC and the Working Capital Margin. Subsequently, the Central Government in Ministry of Power, vide its letter dated 19.4.1995 accorded investment approval for Rs.125102 lakh, excluding Working Capital Margin of Rs.2849 lakh. The Central Government in Ministry of Power accorded sanction for the revised cost estimate for Rs. 137919 lakh, excluding Working Capital Margin of Rs. 3290 lakh in terms of its subsequent letter dated 13.10.1999. Therefore, the latest approved cost for Feroze Gandhi Unchahar TPS Stage II available on record is the revised investment approval accorded by Ministry of Power vide its letter dated 13.10.1999.

3. Feroze Gandhi Unchahar TPS Stage II comprises of two units, each with capacity of 210 MW. The dates of commercial operation of Unit I and Unit II, as stated in the petition and which have not been contested before us, are 1.1.2001 and

1.3.2000 respectively. The terms and conditions of tariff, applicable from 1.4.2001 were notified by the Commission on 26.3.2001. Accordingly, the petition has been filed for approval of tariff from 1.3.2000 to 31.3.2001 based on Ministry of Power notification dated 30.3.1992 and for the period 1.4.2001 to 31.3.2004 based on the Commission's notification dated 26.3.2001 on terms and conditions of tariff. The petitioner has claimed tariff as under:

(Rs. in lakh)

Particulars	1999- 2000	2000- 2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001			
1 Interest on Loan	3587	3608	5899	5869	5783	4655
2 Interest on Working Capital	709	882	1441	1826	2021	2196
3 Depreciation	0	5895	5895	4562	4554	4554
4 Advance Against Depreciation	0	0	0	0	0	2626
5 Return on Equity	3604	3606	5897	5918	5908	5908
6 O & M Expenses	1910	2091	3310	3516	3724	3943
TOTAL	9810	16082	22441	21690	21990	23882

4. The details of the petitioner's claim in support of interest on Working Capital are extracted hereunder:

(Rs. In lakh)

	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001			
Fuel Cost	735	850	1585	2354	2660	2893
Coal Stock	695	812	1507	2251	2542	2757
Oil stock	80	77	157	205	237	272
O & M expenses	156	172	271	288	305	324
Spares ¹	751	826	1303	1382	1465	1553
Receivables- 2 months	3480	4774	7554	8870	9557	10338.6
Total Working Capital	5897	7511	12378	15349	16767	18137
Working capital Margin(WCM)	1645	1645	3290	3290	3290	3290
Total Working Capital	4252	5866	9088	12059	13477	14847
Weighted Average Interest Rate	12.81%	12.19%	12.19%	12.35%	12.48%	12.48%
Interest on Working Capital	545	715	1108	1490	1682	1853
Interest on WCM	85	88	175	178	181	185
Return on WCM	79	79	158	158	158	158
Total Interest on Working capital	709	882	1441	1826	2021	2196

DATE OF COMMERCIAL OPERATION

5. The scheduled and actual dates of commercial operation of two units of Feroze Gandhi Unchahar TPS Stage II are as under:

	Scheduled		Actual	
	Date of Synchronisation	Date of Commercial Operation	Date of Synchronisation	Date of Commercial Operation
Unit-1	January 1999	January 2000	27.1.1999	1.1.2001
Unit-2	-	July 2000	23.10.1999	1.3.2000

6. In view of the fact that the gap between date of synchronization and commercial operation of unit-1 extended beyond the permissible limit of 180 days, the following two alternatives have been considered:

- (i) Alternative 1: Date of synchronization is taken as the actual date of synchronization (i.e. 27.01.1999) and a deemed date of commercial operation is worked out considering a gap of 180 days.
- (ii) Alternative 2: Date of commercial operation is taken as the actual date of commercial operation (i.e. 1.01.2001) and a deemed date of synchronisation is worked out considering a gap of 180 days.

7. The petitioner vide its affidavit dated 12.12.2002 has submitted that the commissioning schedules approved by Ministry of Power vide its letter dated 13.10.99 was as under:

“The first 210 MW unit under Stage –II (2x210 MW) of the project is scheduled to be commissioned by January 2000 while the second unit by July 2000. The first unit has been synchronized in January 1999 ahead of commissioning schedule”.

8. Considering 180 days from the scheduled date of commissioning to arrive at the date of commercial operation, the respective date of scheduled dates of commercial operation of Unit 1 and Unit 2 work out as July 2000 and January 2001 respectively.

9. The petitioner has submitted that it has been able to declare Unit 1 within the time frame of second unit and Unit 2 within the time frame of first unit of Stage – II. Since the capacity of the two units is identical, the respondents have not suffered on account of this interchange in the commercial declaration date of the two units. The respondents have not objected to the submissions made by the petitioner.

10. We have considered the matter. In our opinion, commissioning of Unit 2 prior to Unit 1 has not altered the position materially with regard to availability of the necessary capacity to the beneficiaries within the stipulated time frame. Full capacity became available as originally scheduled . In view of this, the actual date of commercial operation for the respective units have been accepted for the purpose of tariff.

CAPITAL COST

11. As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.3.2001; the actual capital expenditure incurred on completion of the generating station shall be the criterion for fixation of tariff. It is further provided that where actual expenditure exceeds the approved project cost, the excess expenditure as approved by CEA or an appropriate independent agency shall be deemed to be actual capital expenditure for the purpose of determining the tariff.

12. The petitioner has submitted that as per the accounting practice followed by it, capitalisation is done only at the year end and it is not possible to give the project cost on the date of commercial operation. Since there was no system of drawing the accounts and getting them audited on the dates of commercial operation of each of the units, the project cost on the date of commercial operation is stated to be back calculated by deducting additional capitalisation amount from the date of commercial operation to the year end. The following information as regard capital expenditure with reference to the dates of commercial operation is indicated by the petitioner in the amended petition:

	(Rs. in lakh)		
	Unit-2	Unit-1	Total
Gross Block as on 31 st March, 2000 in the balance sheet for the station	75190.14		75190.14
Additional Capitalisation from 2.3.2000 to 31.3.2000	211.78		211.78
FERV from 2.3.2000 to 31.3.2000	-0.10		-0.10
Project cost as on 1.3.2000 (Date of Commercial Operation of Unit-II)	74978.46		74978.46
Additional Capitalisation from 1.4.2000 to 31.3.2001	1442.30		
FERV from 1.4.2000 to 31.3.2001	(-) 1560.60		
Gross Block as on 31 st March, 2001 in the balance sheet for the station	75072.00	48410.51	123482.51
Additional Capitalisation from 2.1.2001 to 31.3.2001(pro rata)	360.57*	1383.86	1744.43
FERV from 2.1.2001 to 31.3.2001(prorate)	-390.15*	-0.56	-390.71
Project cost as on 1.1.2001 (Date of Commercial Operation of Unit-I and the generating station as a whole)	75101.58*	47027.21	122128.79*

*Values not indicated, hence worked out on pro rata basis.

13. The additional capitalisation, for the period 1.3.2000 to 1.1.2001 and 1.1.2001 to 31.3.2001 as per the above table is in the nature of balance payments or on the works

within the scope of the project cost and, therefore, has been allowed to be capitalised for the purpose of tariff.

14. The project cost includes capitalised initial spares to the tune of Rs.984 lakh as on 31.3.2001 (Rs. 244 lakh in 1999-2000 and Rs. 740 lakh in 2000-01 which is less than initial spares of Rs. 2923 lakh in the approved cost.

15. The methodology for apportionment of the cost amongst the different units on the respective the date of commercial operation in terms of the notification dated 30.3.1992 is as under:

“Provided also that in case of multi-unit project, the percentage of capital cost as specified by the Authority (CEA) in its techno economic clearance shall be considered for fixation of tariff, on commercial operation of the progressive units but in case of delay in commissioning of second or subsequent units from the scheduled date, the project cost, for the period of delay, shall be retrospectively approved for the tariff purpose in the ratio of proportionate allocation of units.”

16. Ministry of Power notification dated 30.3.1992 envisages allocation of capital cost in proportion to capacity of the units where there is delay in commissioning of the units. We have already held that Feroze Gandhi Unchahar Thermal Station was commissioned as originally scheduled. Therefore, the provisions of Ministry of Power notification dated 30.3.1992 cannot be invoked for the purpose of apportionment of capital cost between two units. Similarly, the techno-economic clearance of CEA does not contain details of allocation of cost. Therefore, we have considered the actual cost on the respective date of commercial operation of the unit as the project cost for tariff purposes. Similar view was taken while approving tariff for Vindhyachal STPS Stage II.

17. Based on the additional capitalisation allowed and notional FERV worked out corresponding to notional net loan opening for the tariff periods 1.3.2000 to 31.3.2000 and from 1.4.2000 to 31.12.2000 and actual FERV worked out for the tariff period 1.1.2001 to 31.3.2001, the opening and closing capital cost as on relevant dates has been tabulated as below and the same has been considered in the present tariff computation.

	(Rs. in lakh)		
	1999-2000	2000-2001	
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001
Capital Cost			
Opening Balance	74978	75180	121819
Addition-Due to FERV	-10	-1497	-81.07
Addition-Due to ACE	211.78	1081.73	1744.43
Closing Balance	75180	74765	123482

18. Capital cost as on 31.3.2001 has been considered as the opening capital cost for the tariff period 2001-2004.

DEBT-EQUITY RATIO

19. As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.03.2001, the interest on loan capital and return on equity are to be computed, as per the financial package approved by CEA or an appropriate independent agency, as the case may be. The petitioner has claimed tariff by considering debt and equity in the ratio of 50:50. It has been submitted by the respondent that debt and equity should be in the ratio of 80:20 as applicable to IPPs.

20. The actual Debt equity ratio as on the date of commercial operation of the generating units as on 1.1.2001 and as on 31.3.2001 based on the actual loan and equity is of the order of approximately 68:32 and 70:30 respectively. However, from the extract of revised cost estimates of the project submitted by the petitioner to CEA, it is seen that the project was financed with debt and equity ratio of 70:30 and the petitioner has adopted the same ratio in the computation of fixed charges. Accordingly, the notional debt-equity ratio of 70:30 has been adopted for working out the fixed charges

TARGET AVAILABILITY

21. The petitioner has considered target availability of 68.49% for the generating station for the period prior to 1.4.2001 and 80% for the period 1.4.2001 to 31.3.2004 for recovery of full fixed charges and computation of fuel element in the working capital for the period from 1.4.2001 onwards. The target availability considered by the petitioner is in accordance with the notifications dated 30.3.1992 and 26.3.2001 and this has accordingly been considered for computation of tariff.

RETURN ON EQUITY

22. As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.3.2001, return on equity shall be computed on the paid up and subscribed capital and shall be 16% of such capital. The petitioner has claimed return on equity @ 16%. The respondents have, however, submitted that that return on equity should be payable at the rate of 12%. In case of generating stations, return on equity was charged in tariff @ 12% per annum till 31.10.1998. However, it was increased to

16% with effect from 1.11.1998. The respondents have contended that there was no justification to increase return on equity from 12% to 16%. As the things stand, the terms and conditions prescribed by the Central Government as also the Commission legislate that return on equity should be allowed @ 16%. Accordingly, we do not find any justification in support of the issue raised. In our computation of tariff, return on equity @ 16% per annum has been allowed. The charges payable by the respondents on account of return on equity as under:

(Rs in lakh)						
	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 31.3.2002	1.4.2002 to 31.3.2003	1.4.2003 to 31.3.2004
Opening Balance	22493	22554	36546	37045	37045	37045
Increase/decrease due to FERV	-3	-449	-24	0	0	0
Increase/decrease due to Additional Capitalisation	64	325	523	0	0	0
Closing Balance	22554	22429	37045	37045	37045	37045
Average	22524	22492	36795	37045	37045	37045
Rate of Return on Equity	16.00%	16.00%	16.00%	16.00%	16.00%	16.00%
Return on Equity	3604	3599	5887	5927	5927	5927

23. The differences between the petitioner's claim under this head qua the amount allowed are on account of the following reasons:

(a) The equity amount considered is based on debt-equity ratio of 70:30 worked out based on notional/ actual FERV and the additional capitalisation for the relevant period.

(b) No FERV has been considered in the working for the years 2001-02 to 2003-04 as against negative FERV considered in the petition for the years 2001-02 and 2002-03.

INTEREST ON LOAN

24. As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.03.2001, the interest on loan capital shall be computed on the outstanding loans, duly taking into account the schedule of repayment, as per the financial package approved by CEA or an appropriate independent agency, as the case may be. The normative loan amount has been worked out by considering debt-equity in the ratio of 70:30 as already decided. In accordance with earlier decisions of the Commission, the annual repayment amount for calculation of interest on loan as worked out by the following formula, or as claimed in the petition, whichever is higher, has been considered:

Annual actual repayment during the year x normative loan at the beginning of the year / Actual loan at the beginning of the year.

25. The other salient features of calculation of interest on loan are as under:

- (a) Loan draws up to 31.3.2001 have been considered .
- (b) Exchange rate as on 31.3.2001 has been considered for working out actual repayments during the years 2001-02 to 2003-04 in case of foreign loans.
- (c) Some of the loans viz. ADB , SBI-I and HDFC-II loans carry floating rate of interest. Therefore, interest rate prevailing as on 1.4.2001 has been considered for interest computation for the period 1.4.2001 onwards. However, interest on loan shall be subject to adjustment on the basis of actual rate of interest applicable for the period 1.4.2001 onwards. In case the parties are unable to agree to the interest rate applicable, any one of them is at liberty to approach the Commission for appropriate decision.
- (d) As SBI NY-I loan was entirely prepaid on 24.9.2001 and re-financed/ substituted by SBI NY-III loan with lower fixed rate of interest , the interest rate applicable on SBI NY-III loan with lower fixed rate of interest has been considered in the working for the relevant period.
- (e) The financial charges in case of HDFC-II , SBI-I and management fees in case of SBI NY-I loan have not been considered for working out interest rate as the petitioner had clarified in its submission dated 22.12.2003 that these charges were already capitalised. Since no information is available in respect of financial charges applicable in case of substituted SBI NY-III loan , financial charges have not been considered for working out the interest rate of SBI NY-III loan.

(f) The commitment fees @ 0.75 % per annum as indicated by the petitioner in Form-7 of the petition have not been allowed in case of ADB loans as commitment fees are generally applicable on un-disbursed portion of loans and would have been capitalised .

26. The necessary details of loan and computation of interest on loan are appended hereinbelow:

(Rs. in lakh)

	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 31.3.2002	1.4.2002 to 31.3.2003	1.4.2003 to 31.3.2004
Gross Loan -Opening	52485	52626	85273	86438	86438	86438
Cumulative Repayment up to the previous year	7524	7524	9512	9512	11464	13616
Net Loan-Opening	44961	45102	75762	76926	74974	72821
increase/decrease due to FERV	-7	-1048	-57	0	0	0
Increase/decrease due to additional capitalisation	148	757	1221	0	0	0
Total	45102	44811	76926	76926	74974	72821
Repayment	0	1988	0	1952	2152	27236
Net Loan-Closing	45102	42824	76926	74974	72821	45586
Average Loan	45031	43963	76344	75950	73898	59204
Rate of Interest	6.42%	6.60%	6.71%	6.55%	6.35%	6.44%
Interest	2890	2900	5119	4973	4696	3813

27. The following reasons are attributable to the difference between the petitioner's claim and the entitlement worked out in this order:

(a) The interest amount considered is based on debt-equity ratio of 70:30 worked out based on notional/ actual FERV and the additional capitalisation for the relevant period.

(b) No FERV has been considered in the working for the years 2001-02 to 2003-04 as against negative FERV considered in the petition for the years 2001-02 and 2002-03.

(c) As SBI NY-I has been substituted with SBI NY-III loan on 24.9.2001, the interest rate applicable on SBI NY-III loan which is 5.81 % has been considered for the period 24.9.2001 onwards against interest rate of 7.21 % claimed in the petition.

(d) Financial charges in case of HDFC-II, SBI-I and SBI NY-I/SBI NY-III loans and commitment fees in case of ADB loan have not been considered while computing interest on loan.

(e) Repayment of loan has been worked out as per formula given in para 24 above. The reduced weighted average interest rate on account of above is 6.42% for the year 1999-00, 6.60% and 6.71% for the year 2000-01 and 6.55%, 6.35% and 6.44% for the years 2001-02 to 2003-04 against 7.39% and 7.61% for the years 1999-00 and 2000-01 and 7.74%, 7.86% and 8.03% for the years 2001-02 to 2003-04 considered in the petition .

DEPRECIATION

28. As per Ministry of Power notification dated 30.3.1992, depreciation for computation of annual fixed charges is to be considered in accordance with the rates notified by the

Central Government from time to time under Section 43A (2) of the Electricity (Supply) Act, 1948. These rates were notified by the Central Government vide notification dated 29.3.1994. The Commission's notification dated 26.3.2001, prescribes that the value base for the purpose of depreciation shall be historical cost of the asset and the depreciation shall be calculated annually as per straight line method at the rates of depreciation prescribed in the Schedule thereto.

29. Depreciation for the tariff period has been calculated by taking the individual assets and their depreciation rates as per Ministry of Power's notification dated 30.3.1992 read with notification dated 29.3.1994 and the Commission's notification dated 26.03.2001. For the period 1.4.2001 onwards, since the Commission's notification dated 26.3.2001 stipulates that the depreciation shall be chargeable from the first year of operation on *pro-rata* basis, the depreciation has been worked out on the average of opening and closing gross block during the year.

	(Rs. in lakh)					
	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 31.3.2002	1.4.2002 to 31.3.2003	1.4.2003 to 31.3.2004
Rate Of Depreciation	7.84%	7.84%	7.84%	3.70%	3.70%	3.70%
Depreciation recovered in tariff	0	5894	5894	4572	4572	4572
Advance against Depreciation (AAD) recovered in tariff	0	0	0	0	0	2631
Total Depreciation recovered in tariff	0	5894	5894	4572	4572	7203
Cumulative Depreciation/AAD recovered in tariff	0	4441	5894	10466	15038	22241

30. The reasons for the difference between the petitioner's claim and the depreciation considered in this order is on account of the reason that FERV has not been considered

in the working for the years 2001-02 to 2003-04 as against negative FERV considered in the petition for the years 2001-02 and 2002-03.

ADVANCE AGAINST DEPRECIATION

31. As per the Commission's notification dated 26.3.2001, Advance Against Depreciation shall be permitted wherever originally scheduled loan repayment exceeds the depreciation allowable and shall be computed as follows:

AAD= Originally scheduled loan repayment amount subject to a ceiling of 1/12th of original loan amount minus depreciation as per schedule.

32. The provision of Advance Against Depreciation was not applicable prior to 1.4.2001. The actual gross loan and actual repayment as on 1.4.2001 has been considered for computing Advance Against Depreciation. The petitioner is entitled to claim any Advance Against Depreciation as shown below:

	(Rs. in lakh)					
	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 31.3.2002	1.4.2002 to 31.3.2003	1.4.2003 to 31.3.2004
1/12 th of Loan(s)				7203	7203	7203
Scheduled Repayment of the Loan(s)				1952	2152	27236
Minimum of the above				1952	2152	7203
Depreciation during the year				4572	4572	4572
Advance Against Depreciation				0	0	2631

O&M EXPENSES

33. As per Ministry of Power notification dated 30.3.1992, operation and maintenance expenses including insurance for the first full year, after commissioning of the generating station shall be calculated as a percentage on the actual capital expenditure on the basis of one of the following alternatives, namely:

- (i) At the rate of 2.5 per cent of the actual capital expenditure of ceiling on capital provided in the power purchase agreement; or
- (ii) At 2 per cent of the actual capital expenditure on ceiling on capital expenditure provided in the power purchase agreement together with actual expenditure on insurance.

Provided that total of 2 per cent of the actual capital expenditure on ceiling on capital expenditure provided in the power purchase agreement and the actual expenditure on insurance shall not exceed 3 percent on the capital expenditure.

34. The Commission's notification dated 26.3.2001 lays down that the base O&M expenses for the new generating stations shall be fixed at 2.5% of the actual capital cost as approved by CEA or an appropriate Independent agency, as the case may be, in the year of commissioning and shall be escalated @10% p.a. for subsequent years to arrive at O&M expenses for the base year 1999-2000 level. Thereafter, the base O & M expenses shall be further escalated at the rate of 6% p.a. to arrive at permissible O & M expenses for the relevant year.

35. In the present case, the base year is 1999-2000 for Unit II and 2000-2001 for Unit I, which is also the year of commissioning of the generating station. In accordance with the above methodologies, the petitioner shall be entitled to O&M expenses in tariff as computed hereinbelow:

(Rs. in lakh)						
	1999-2000	2000-2001		2001-02	2002-03	2003-04
	1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 31.3.2002	1.4.2002 to 31.3.2003	1.4.2003 to 31.3.2004
%age of Capital Cost	2.50%					
Escalation Factor after 1 year	6.00%					
Unit- 2	1874	1874	1884	1997	2117	2244
Addition -Unit-2	3	5	5	5	6	6
		-5	-5	-11	-11	-12
Unit 1			1176	1194	1265	1341
Addition -Unit-1			21	42	44	47
O & M Expenses	1877	1874	3081	3227	3421	3626

36. The reasons for the difference between the petitioner's claim and the O&M considered in this order are attributable to the fact that no FERV has been considered in the working for the years 2001-02 to 2003-04 as against negative FERV considered in the petition for the years 2001-02 and 2002-03.

INTEREST ON WORKING CAPITAL

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

- (a) **Fuel Cost:** As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.03.2001, fuel cost for one month corresponding to normative plant load factor/target availability is permissible. Accordingly, the fuel cost is worked out for one month on the

basis of operational parameters as given in Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.03.2001.

(b) **Coal Stock:** As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.03.2001, reasonable fuel stock as actually maintained but limited to 15 days for pit head station and thirty days for non-pit head stations, corresponding to target availability is permissible. Accordingly, the coal stock has been worked out for 30 days on the basis of operational parameters and price of coal prescribed. As separate audited accounts of Feroze Gandhi Unchahar TPS, Stage-II for 1999-2000 and 2000-2001 are not available, the actual coal stock as on 31.3.2000 and 31.3.2001 has been worked out from the actual coal stock figure as per consolidated audited accounts of Feroze Gandhi Unchahar TPS, Stage-I&II combined as on 31.3.2000 and 31.3.2001 on the basis of corresponding installed capacity. However for tariff purpose, the lower of two values i.e actual coal stock as worked out for Feroze Gandhi Unchahar TPS, Stage-II based on audited balance sheet and as worked out based on operational parameters prescribed and price of coal has been considered.

(c) **Oil Stock:** As per Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.3.2001, 60 days stock of secondary fuel oil, corresponding to target availability is permissible. Accordingly, the oil stock has been worked out for 60 days based on the operational parameters prescribed and price of oil .

(d) **O&M Expenses:** As per Ministry of Power notification dated 30.3.1992 and as per the Commission's notification dated 26.03.2001, operation and maintenance expenses (cash) for one month are permissible as a part of the working capital. Accordingly, O&M expenses for working capital has been worked out for 1 month of O&M expenses considered in tariff of the respective year.

(e) **Spares:** As per Ministry of Power notification dated 30.3.1992 and as per the Commission's notification dated 26.3.2001, maintenance spares at actuals subject to a maximum of 1% of the capital cost but not exceeding 1 year's requirements less value of 1/5th of initial spares already capitalised for first 5 years are required to be considered in the working capital. Accordingly, the spares requirement for the purpose of working capital has been worked out @ 1% of the capital cost less value of 1/5th of initial spares already capitalised. The amount of initial spares stated to be capitalized by the petitioner is Rs. 984 lakh as on 31.3.2001.

(f) **Receivables:** As per Ministry of Power notification dated 30.3.92 and as per the Commission's notification dated 26.03.2001, receivables will be equivalent to two months average billing for sale of electricity calculated on normative plant load factor/Target Availability. However, receivables have been worked out on the basis of two months of fixed and variable charges.

38. The relevant details in support of computation of fuel cost, Naptha stock and receivables are appended herein below:

(Rs. in lakh)

	1.3.2000 to 31.3.2000 (1999-00)	1.4.2000 to 27.8.2000 (2000-01)	28.8.2000 to 31.12.2000 (2000-01)	1.4.2000 to 31.12.2000 (2000-01)	1.1.2001 to 31.3.2001 (2000-01)	1.1.2001 to 31.3.2001 (2000-01)	1.1.2001 to 31.3.2001 (2000-01)	2001-02 (1.4.2001 to 29.6.2001)	2001-02 (1.4.2001 to 29.6.2001)	2001-02 (30.6.2001 to 31.3.2002)	2001-02	2002-03	2003-04
	Stablisation period	Stablisation period	After Stablisation period		After Stablisation period	Stablisation period		Stablisation period of Unit-1	After Stablisation period of Unit-2	After stablisation period of Unit-1 & 2			
		Unit-2	Unit-2	Unit-2	Unit-2	Unit-2	Unit-1	Unit-1& 2	Unit-1	Unit-2			
Oil Stock													
Weighted Avg. GCV of Oil (kCal/Lit.)	9986.67	9986.67	9986.67	9986.67	9986.67	9986.67	9986.67	9983.33	9983.33	9983.33	9983.33	9983.33	9983.33
Heat Contribution by Oil (kCal/kWh)	49.93	49.93	34.95	41.99	34.95	49.93	41.37	49.92	34.94	34.94	36.79	34.94	34.94
Requirement of Oil for the period (litres)	400205	1928836	1522356	3451192	1087397	1165068	2252466	1814400	1270080	7761600	10846080	10301760	10329984
Oil Stock (60 days) (KL)	774.59	776.71	724.93	752.99	724.93	776.71	1501.64	1209.60	846.72	1693.44	1782.92	1693.44	1693.44
Weighted Avg. Price of Oil (Rs./KL)	10178.77	10178.77	10178.77	10178.77	10178.77	10178.77	10178.77	11235.22	11235.22	11235.22	11235.22	11235.22	11235.22
Oil Stock- 60 days- (Rs. in lakh)	78.84	79.06	73.79	76.64	73.79	79.06	152.85	135.90	95.13	190.26	200.31	190.26	190.26
									231.03				
Coal Stock													
Weighted Avg. GCV of Coal (kCal/kg)	3510.00	3510.00	3510.00	3510.00	3510.00	3510.00	3510.00	3502.67	3502.67	3502.67	3502.67	3502.67	3502.67
Heat Contribution by Coal (kCal/kWh)	2550.07	2550.07	2465.05	2505.01	2465.05	2550.07	2501.48	2550.08	2465.06	2465.06	2475.54	2465.06	2465.06
Specific Coal Consumption (kg/kWh)	0.7265	0.7265	0.7023	0.7137	0.7023	0.7265	0.7127	0.7280	0.7038	0.7038	0.7068	0.7038	0.7038
Requirement of Coal for the period (MT)	58151	280265	305468	585734	218192	169288	387480	264191	255382	1560670	2080244	2071435	2077110
Coal Stock (30 days) (MT)	56275	56429	72731	63898	72731	56429	129160	88064	85127	170255	170979	170255	170255
Weighted Avg. Price of Coal (Rs./MT)	1214.11	1214.11	1214.11	1214.11	1214.11	1214.11	1214.11	1307.63	1307.63	1307.63	1307.63	1307.63	1307.63
Coal Stock-30 days- (Rs. In lakh)	683.24	685.11	883.03	775.79	883.03	685.11	1568.14	1152	1113	2226	2236	2226	2226

Actual Coal Stock- as per Audited Accounts	0			969			969				1197	1197	1197
Coal stock considered in tariff	0			776			969				1197	1197	1197
Fuel Cost-													
Oil -1 Month (KL)	394	394	368	382	368	394	761	613	429	858	904	858	861
Oil Cost -1 Month (Rs. in lakh)	40	40	37	39	37	40	77	69	48	96	102	96	97
Coal -1 month (MT)	57213	57213	73741	64786	73741	57213	130954	89287	86310	172620	173354	172620	173093
Coal cost -1 month (Rs. in lakh)	695	695	895	787	895	695	1590	1168	1129	2257	2267	2257	2263
Fuel Cost - 1 month (Rs in lakh)	735	735	933	825	933	735	1667	1236	1177	2354	2368	2354	2360
Variable Charges													
Coal (Rs/kWh)													
Oil (Rs/kWh)	0.9801	0.9801	0.9422	0.9599	0.9422	0.9801	0.9584	1.0578	1.0169	1.0169	1.0219	1.0169	1.0169
Rs./kWh	0.0565	0.0565	0.0394	0.0474	0.0394	0.0565	0.0467	0.0624	0.0435	0.0435	0.0458	0.0435	0.0435
	1.0366	1.0366	0.9815	1.0074	0.9815	1.0366	1.0051	1.1202	1.0603	1.0603	1.0677	1.0603	1.0603
Variable Charges for the period	747	3599	3864	7463	2760	2174	4934	3658	3482	21280	28420	28244	28322
Variable Charges - 2 months	1469	1469	1865	1651	1865	1469	3335	2473	2354	4707	4737	4707	4720
Fixed Charges - 2 months	1488			2503			3540				3369	3354	3687
Receivables	2957			4154			6875				8106	8062	8407

39. The Commission's notification dated 26.03.2001 is silent about the financing of the working capital margin. Therefore the return and interest is not separately calculated on working capital margin and interest on the total working capital is worked out.

40. The average SBI PLR of 12% during 1999-2000 and 11.5% during 2000-2001 is considered as the rate of interest on working capital. For the tariff period 2001-2002 to 2003-2004, SBI PLR of 11.5% as on 1.4.2001 has been considered as the rate of interest on working capital in line with the Commission's earlier decision.

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

(Rs. in lakh)						
	1.3.2000 to 31.3.2000	1999-2000 1.4.2000 to 31.12.2000	2000-2001 1.1.2001 to 31.3.2001	2001-02	2002-03	2003-04
Days in the Year	366	365	365	365	365	366
Period (days)	31	275	90	365	365	366
Fuel Cost	735	825	1667	2368	2354	2360
Coal Stock	0	776	969	1197	1197	1197
Oil stock	79	77	153	200	190	190
O & M expenses	156	156	257	269	285	302
Spares ¹	701	555	1021	1038	1038	1038
Receivables- 2 months	2957	4154	6875	8106	8062	8407
Total Working Capital	4628	6543	10942	13179	13126	13495
Weighted Average Interest Rate	12.00%	11.50%	11.50%	11.50%	11.50%	11.50%
Interest on Working Capital	555	752	1258	1516	1509	1552

42. There are differences between the petitioner's claim and the amount of interest on working capital allowed and these differences are for the reasons given below:

- (a) Due to difference in the operational parameters and price of fuel.
- (b) Due to difference in O&M expenses as explained above

(c) 40% of O&M expenses on account of spares have been considered in the petition against actual spares consumption/one year requirement restricted to 1% of capital cost as on 1.4.2001 considered in our computation.

ANNUAL FIXED CHARGES

43. 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	1999- 2000	2000- 2001		2001-02	2002-03	2003-04
		1.3.2000 to 31.3.2000	1.4.2000 to 31.12.2000	1.1.2001 to 31.3.2001			
1	Interest on Loan	2890	2900	5119	4973	4696	3813
2	Interest on Working Capital	555	752	1258	1516	1509	1552
3	Depreciation	0	5894	5894	4572	4572	4572
4	Advance Against Depreciation	0	0	0	0	0	2631
5	Return on Equity	3604	3599	5887	5927	5927	5927
6	O & M Expenses	1877	1874	3081	3227	3421	3626
	TOTAL	8926	15019	21240	20216	20125	22121

VARIABLE CHARGES

44. The operational norms have been considered for the computation of energy charges in terms of Ministry of Power Notification dated 30.3.1992 and the Commission's notification dated 26.3.2001. The Commission has decided to adopt the unit price of coal as per PSL after deliberating on the issue in detail based on the presentation made by the petitioner on 8.4.2003 and the information furnished subsequently. The fuel price and GCV furnished by the petitioner for the months of January, February, and March 2000 for tariff period up to 31.3.2001 and for the months of January, February, and March 2001 for

the period 2001-2002 to 2003-2004 in the revised petition dated 17.9.2002 have been considered for the base energy charge computations.

45. The Energy Charges have been computed based on the data furnished in the petitions and are summarised below:

Description	Unit	1.3.2000 to 27.8.2000	28.8.2000 to 31.12.2000	1.1.2001 to 31.3.2001	1.4.2001 to 29.6.2001	30.6.2001 to 31.3.2004
Capacity	MW	210.00	210.00	420.00	420.00	420.00
Normative PLF/ Availability	%	51.37	68.49	59.93	80.00	80.00
Gross Station Heat Rate	kCal/kWh	2600.00	2500.00	2550.00	2550.00	2500.00
Specific Fuel Oil Consumption	ml/kWh	5.00	3.50	4.25	4.25	3.50
Aux. Energy Consumption	%	10.00	9.50	9.75	9.75	9.50
Weighted Average GCV of Oil	kCal/l	9986.67	9986.67	9986.67	9983.33	9983.33
Weighted Average GCV of Coal	kCal/Kg	3510.00	3510.00	3510.00	3502.67	3502.67
Weighted Average Price of Oil	Rs./KL	10178.77	10178.77	10178.77	11235.22	11235.22
Weighted Average Price of Coal	Rs./MT	1214.11	1214.11	1214.11	1307.63	1307.63
Rate of Energy Charge ex-bus per kWh Sent	Paise/kWh	103.66	98.15	100.90	109.02	106.03

46. The base energy charges have been calculated on base value of GCV, base price of fuel and normative operating parameters as indicated above. The Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.3.2001 provide for fuel price adjustment for variation in fuel price and GCV of fuels. These notifications also provide that for the purpose of calculating the tariff, the operating parameters, that is, 'Station Heat Rate', 'Secondary Fuel Oil Consumption' and 'Auxiliary Consumption' shall be determined on the basis of actuals or norms, whichever is lower. Therefore, the base energy charges approved shall be subject to standard fuel price variation and adjustment based on actual operational parameters achieved or the normative parameters, whichever is lower.

47. The Base Energy Charges (BEC) shall, therefore, be subject to fuel price adjustment as per following formula:

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

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,

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

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

Where,

SFC_n – Normative Specific Fuel Oil consumption in l/kWh

SHR_n – Normative Gross Station Heat Rate in kCal/kWh

AC_n – Normative Auxiliary Consumption in percentage

P_{om} – Weighted Average price of fuel oil as per PSL for 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 as per PSL for 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 determination of base energy charge in tariff order in kCal/Kg

48. The above formula is different from the FPA formula earlier considered in Commission's tariff orders in case of Singrauli STPS, Ramagundam STPs etc. based on Ministry of Power's project specific tariff notifications. The FPA formula has been corrected considering variation in heat value of oil and specifying correct unit of specific fuel oil consumption. The correctness of the above corrected formula has been verified by using actual numbers.

49. The energy charges shall be finally adjusted on annual basis as per actual annual average values of operating parameters achieved for the station i.e. 'Station Heat Rate', 'Auxiliary Energy Consumption' and 'Specific Fuel Oil Consumption' provided any or all of the actual operating parameters are lower than their respective normative values. The annual energy charge adjustment shall be done as per the formula given below: -

$$AECA = (P - Q - R) \times 10^{-9}$$

Where,

AECA - Annual Energy Charge Adjustment in Rs. Crore

- P** - Energy charge payable for the year based on operational parameters (Actual or normative whichever is lower) and weighted average price and GCV of fuels for the year in paise
- Q** - Total amount recovered as monthly fuel price adjustment for the year in Paise
- R** - Total amount recovered as base energy charge for the year in Paise

And,

$$P = (ESO_{\text{Annual}}) \times 10 \times \left[\frac{\{(SFC_A) \times P_O\} + \{(SHR_A) - (SFC_A) \times K_O / 1000\} \times P_C / K_C}{\{100 - (AC_A)\}} \right]$$

$$Q = \sum_{mi=1}^{12} (FPA_{mi}) \times (ESO_{mi})$$

$$R = (ESO_{\text{Annual}}) \times BEC$$

Where,

- ESO_{Annual} - Energy sent out in the year in kwh sent out based on actual draws for the tariff period up to 31.3.2001 and based on generation schedules given by RLDC for the tariff period 1.4.2001 to 31.3.2004
- SFC_A - Actual average secondary fuel oil consumption of the station for the year in l/kWh sent out
- K_O - Weighted average GCV of secondary fuel oil for the year in kCal/Litre
- P_O - Weighted average price of secondary fuel oil for the year in Rs./KL
- SHR_A - Actual yearly weighted average gross station heat rate in kCal/kWh generated
- P_C - Weighted average price of coal for the year in Rs./MT
- K_C - Weighted average GCV of coal for the year in kCal/kg
- FPA_{mi} - Fuel price adjustment for the i^{th} month in paisa/kWh sent out
- ESO_{mi} - Energy sent out for the i^{th} month in kWh sent out based on actual draws for the tariff period up to 31.3.2001 and based on generation schedules given by RLDC for the tariff period 1.4.2001 to 31.3.2004

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

AC - Actual average Auxiliary Consumption of the station for the year in percentage.

50. In case the adjustment period is less than a year, adjustment shall be done for the actual period.

51. The fixed and variable charges have been decided by us in the preceding paras for Feroze Gandhi Unchahar TPS Stage II for the previous years. The petitioner has already recovered fixed and variable charges from the respondent based on the interim orders of the Commission. The amount already recovered shall be adjusted against the revised charges decided by us through this order.

52. In addition to these charges, 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 Ministry of Power notification dated 30.3.1992 and the Commission's notification dated 26.3.2001, as applicable.

53. This order disposes of Petition No 1/2000.

Sd/-
(K.N. SINHA)
MEMBER

Sd/-
(ASHOK BASU)
CHAIRMAN

New Delhi dated the 18th June 2004