

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

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

Petition No. 119/2005

In the matter of

Approval of final tariff of Indira Sagar Hydroelectric Project (8x125 MW) for the periods 14.1.2004 to 31.3.2004 and 1.4.2004 to 31.3.2009

And in the matter of

Narmada Hydroelectric Development Corporation Ltd

.....Petitioner

Vs

1. Narmada Valley Development Department, Bhopal
2. Madhya Pradesh State Electricity Board, Jabalpur

.....Respondents

The following were present

1. Shri Harish Aggarwal, NHDC
2. Shri V.K.Gupta, NHDC
3. Shri Vinod Kumar Jangra, NHDC
4. Shri A.K.Garg, MPPTC
5. Shri S.K. Khiyani, Govt. of Madhya Pradesh

**ORDER
(DATE OF HEARING : 17.8.2006)**

This petition has been filed by the petitioner, Narmada Hydroelectric Development Corporation Ltd. (NHDC) for approval of final tariff of Indira Sagar Hydroelectric Project (8x125 MW) (hereinafter referred to as "the generating station") for the periods 14.1.2004 to 31.3.2004 and 1.4.2004 to 31.3.2009. The tariff for the period 14.1.2004 to 31.3.2004 has been claimed under CERC (Terms & Conditions of Tariff) Regulations, 2001 (hereinafter referred to as "the 2001 regulations") and for the

period 1.4.2004 to 31.3.2009 as per CERC (Terms and Conditions of Tariff) Regulations, 2004 (hereinafter referred to as “the 2004 regulations”).

2. The petitioner has constructed Indira Sagar Hydroelectric Project, a multi-purpose project to facilitate power generation and create facilities for irrigation etc. Indira Sagar Hydroelectric Project, has three units, of which Unit I comprises dam and appurtenant works, Unit II comprises irrigation system and Unit III is dedicated to power generation. Unit I is common to both power generation and irrigation system. Unit III comprises of power station with installation of 8 machines each of 125 MW installed capacity, associated water conductor system and switchyard.

3. As per the approval dated 28.3.2002 accorded by the Central Government, Sardar Sarovar Project component is apportioned 17.63% of cost of Unit-I and the irrigation component of Indira Sagar Project is apportioned 16.75% of balance cost of Unit –I after deducting Sardar Sarovar component. Accordingly, the net cost of the power component of the Indira Sagar project after apportionment works out to Rs. 352754 lakh (including IDC) as under:

(Rs in lakh)

S.No	Description	
a)	Cost of Works	
	(i) Unit –I (Dam & appurtenant works)	263477*
	(ii) Unit –III (Power House & Water conductor System)\	123243
b)	Total cost of works	386720
c)	Sardar Sarovar Project Component (17.63% of unit –I)	46451
d)	Irrigation component of ISP (16.75% of unit-I after deducting the SSP component)	36352
e)	Net Cost of Power Component (b-c-d)	303917
f)	Interest During Construction	48837
g)	Total cost of Power Component of ISP	352754

*(Includes Rehabilitation & Resettlement charges of Rs.1160 00 lakh)

4. The date of completion of the dam and achieving MCR is 25.8.2005, although the dates of commercial operation of the eight machines of the generating station are as follows:

Machine	Date of commercial operation
Machine I	14.01.2004
Machine II	18.01.2004
Machine III	06.03.2004
Machine IV	29.03.2004
Machine V	27.07.2004
Machine VII	01.11.2004
Machine VI	07.01. 2005
Machine VIII	30.03.2005

5. As per clause (ix) of Regulation 31 of the 2004 regulations, date of commercial operation in relation to a unit is the date declared by the generator after demonstrating the Maximum Continuous Rating (MCR) or Installed Capacity (IC) through successful trial run, after notice to the beneficiaries, and in relation to the generating station it is the date of commercial operation of the last unit of the generating station. Accordingly, the petitioner has considered 25.8.2005, the date of achieving MCR of eight machines, as the date of commercial operation of the generating station, although the date of commercial operation of 8th and last machine is 30.3.2005. Since the maximum continuous rating of the generating station after completion of dam was achieved on 25.8.2005, the date of commercial operation of the generating station for the purpose of tariff determination is taken as 25.8.2005.

6. As against the estimated completion date of May 2005 as per the Central Government's approval of 28.3.2002, all the generating units, dam up to FRL and

related works have been completed on 25.8.2005, which is almost close to the schedule of May 2005. As such, there is not significant time overrun on the project.

7. The Commission has allowed following provisional tariffs for the generating station so far :

- (i) Tariff for two machines (I & II) commissioned on 14.1.2004 and 18.1.2004, vide order dated 1.3.2004 in Petition No. 86/2003.
- (ii) Tariff for the period 14.1.2004 to 31.3.2004 for four machines (I to IV) commissioned between 14.1.2004 to 29.3.2004, vide order dated 6.12.2004 in Petition No. 19/2004.
- (iii) Tariff for the period 1.4.2004 to 31.3.2005 for seven machines (I to VII) vide order dated 12.5.2005 in Petition No.64/2004.

8. When the provisional tariff was allowed, the dam was partially complete without spillway gates, and therefore, there was lower MW output as compared to MW output achievable with FRL. The Commission had, therefore, allowed Annual Fixed Charges reduced proportionately by applying the following formula, namely-

$$\text{Tariff allowed} = \text{Annual Fixed Charges} \times P1/P$$

Where P1 is the actual peaking power with reduced height of dam and P the peaking power achievable on completion of dam.

9. The petitioner has worked out the capital cost as on date of commercial operation of each machine by taking minimum of the following:

- (a) Total anticipated capital cost of power component on completion of the generating station (Rs. 326388 lakh) number of machines commissioned/Total number of machines.
- (b) Total capitalised expenditure up to the date of commercial operation of the machine(s).
- (c) Proportionate expenditure on commissioned unit(s), including work in progress, up to the date of commercial operation.
- (d) Proportionate expenditure on commissioned machines, that is, P1/P of anticipated capital cost as worked out at (a) above. The admitted capital cost is minimum of (b), (c) & (d).

10. The proportionate capital cost thus considered by the petitioner for the tariff purpose as on the date of commercial operation of the respective machine is as follows:

(Rs in lakh)			
Sl No.	Machines commissioned	the date of commercial operation	Proportionate capital cost
1.	Machine –II	14.1.2004	27028
2.	Machine–I & II	18.1.2004	54173
3.	Machine – I to III	6.3.2004	82826
4	Machine – I to IV	29.3.2004	110435
5	Machine – I to V	27.7.2005	162222
6	Machine – I to VI	1.11.2005	195267
7	Machine – I to VII	7.1.2005	231418
8.	Machine – I to VIII	30.3.2005	260542
9.	Station COD	25.8.2005	294992

11. The petitioner has claimed IDC and FC amounting to Rs. 8293 lakh up to the date of commercial operation of the last machine (30.3.2005) as given below:

(Rs in lakh)

The date of commercial operation	IDC
14.1.2004	3572
18.1.2004	3638
6.3.2004	4500
29.3.2004	4958
27.7.2005	6411
1.11.2005	7431
7.1.2005	7959
30.3.2005	8293

12. Based on the above capital cost, the petitioner has claimed the following Annual Fixed Charges for the year 2003-04 and onwards:

(Rs in lakh)

Particulars	2003-04 (Pro rata)	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	303	3867	6350	6608	6608	6608
Interest on Loan	641	8063	13001	13167	12660	12153
Return on Equity	830	9250	15190	15805	15805	15805
Advance against depreciation	0	0	0	0	0	623
Interest on working capital	049	609	995	1113	1134	1163
O&M expenses	203	2590	4253	4602	4786	4977
Total	2026	24378	39788	41295	40993	41330

13. The details of working capital furnished by the petitioner and its claim of interest thereon are summarised below:

(Rs in lakh)

Particulars	14.1.04 to 17.1.04	18.1.04 to 5.3.04	6.3.04 to 28.3.04	29.3.04 to 31.3.04
Maintenance spares- Annual basis	270.00	542.00	828.00	1104.00
O&M expenses-monthly- annual	34.00	68.00	104.00	138.00
Receivables-annual basis	664.00	1333.00	2035.00	2707.00
Total Working Capital	968.00	1943.00	2967.00	3949.00
Rate of Interest	10.25%	10.25%	10.25%	10.25%
Interest on Working capital	99.22	199.16	304.12	404.77

(Rs. in lakh)

Particulars	1.4.04 to 26.7.04	27.7.04 to 31.10.04	1.11.04 to 6.1.05	7.1.05 to 29.3.05	30.3.05 to 31.3.05	1.4.05 to 24.8.05	25.8.05 to 31.3.06	2006-07	2007-08	2008-09
Maintenance spares-Annual basis	1256.00	1622.00	1953.00	2315.00	2605.00	2662.70	2949.92	3126.92	3314.53	3513.40
O&M expenses-monthly-annual	157.00	203.00	244.00	289.00	326.00	332.84	332.80	383.49	398.83	414.78
Receivables-annual basis	2925.00	3768.00	4527.00	5361.00	6023.00	6159.00	6798.00	6883.00	6832.00	6888.0
Total Working Capital	4338.00	5593.00	6724.00	7965.00	8954.00	9154.54	10080.72	10393.40	10545.36	10816.16
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.75%	10.75%	10.75%
Interest on Working capital	143.00	152.00	127.00	183.00	5.00	375.00	620.00	1113.00	1134.00	1163.00

Capital Cost

14. The apportionment of cost and funding arrangement shown in the approval letter dated 28.3.2002 is as below:

Sr. No.	Particulars	Cost (Rs. in lakh)
1	Unit – I (Dam & appurtenant Works)	
	a) Power Component	180674
	b) Irrigation component in Indira Sagar Dam	36352
	c) SSP component as subvention.	46451
	Total cost of Unit-I	263477
2	Unit-III (Power House)	123243
3	Interest During Construction (IDC)	48837
	Total cost of the project	435557
	Cost of Power Component (1(a)+2+3)	352764

Equity Structure and Funding

Sr. No.	Particulars	Cost (Rs. in lakh)	%
1	Equity		
	i) NHPC(Thro' budgetary support and contribution	69000	19.56%
	ii) GoMP	66000	18.71%
	Total Equity	135000	38.27%
2	Loan	217754	61.73%
	Total (power Component)	352754	100.00%
3	Contribution by GoMP towards Irrigation Component in Indira Sagar Dam	36352	
4	Subvention from Sardar Sarovar Project	46451	
	Grand Total	435557	

15. As per the 2001 regulations, the capital expenditure of the project is to be financed as per the approved financial package set out in the techno-economic clearance of the Authority or as approved by an appropriate independent agency, as the case may be. The project cost shall include reasonable amount of capitalized initial spares. The actual capital expenditure incurred on completion of the project shall form the basis for fixation of tariff. Where the actual expenditure exceeds the approved project cost, the excess expenditure as allowed by the Authority or an appropriate independent agency shall be considered for the purpose of fixation of tariff, provided such excess expenditure is not attributable to the generating company or its suppliers or contractors. Under the 2004 regulations, subject to prudence check by the Commission, the actual expenditure incurred on completion of the project forms the basis for determination of final tariff. The final tariff is determined based on the admitted capital expenditure actually incurred up to the date of commercial operation of the generating station and includes initial capital spares subject to a ceiling norm of 1.5% of the original project cost as on the cut off date. In case of the existing generating stations, the project cost admitted by the Commission prior to 1.4.2004 forms the basis for determination of tariff.

16. Based on audited accounts, the petitioner has submitted the following details of the expenditure capitalised (Power component) as on the date of commercial operation of the generating station:

(Rs in lakh)	
Description	
Expenditure as on 24.8.2005	387871
(includes Rs. 141575 lakh on R&R works and Rs. 28706 lakh on diversion of Railway track, total amounting to Rs. 170281 lakh)	
Less cost not charged to power	
(i) SSP & Irrigation Component 80092	
(ii) R&R contribution by GoMP 12787	
Sub-total	92879

Net expenditure on Power Component, including IDC

294992

17. The expenditure of Rs. 294992 lakh as on the date of commercial operation of the generating station is within the approved cost of Rs. 352754 lakh. The capital cost as on 24.8.2005 amounting to Rs.294992 lakh is admitted for the purpose of tariff.

18. The petitioner has submitted that after the date of commercial operation of the generating station, expenditure on the balance left over works is anticipated to be Rs. 31396 lakh. The petitioner may approach the Commission for revision of tariff, if so advised, after the anticipated expenditure is capitalised to be considered under Regulation 34 of the 2004 regulations.

19. Respondent No 2, MPSEB, has submitted that according to clause (ii) of Regulation 38 of the 2004 regulations, land is not a depreciable asset and its cost is required to be excluded from the capital cost while computing historical cost of the asset. The capital expenditure of Rs.294992 lakh incurred as on the date of commercial operation of the generating station, 25.08.2005, includes a component of land and R&R amounting to Rs.170353 lakh, which is to be excluded while calculating allowable depreciation for tariff computation. The petitioner in its reply has submitted that the expenditure of Rs.170353 lakh under the head of land includes the expenditure on diversion of Railway line which is now the asset of another department and on R&R for the land acquired for reservoir. The expenditure on R&R includes grant, compensation for houses, trees and the agricultural land, given to the land oustees and expenditure on their resettlement, etc. The agricultural land after submergence does not remain in its original condition and form and its market value gets diminished after submergence and silt deposit. Thus, the historical cost of "Dams & Barrages" includes the R&R cost incurred for acquisition of land and other

properties, which got submerged due to formation of reservoir. Para 3.14 of National Policy on Hydel Projects also states that all the costs on land acquisition, resettlement and rehabilitation and catchment area treatment shall be considered as cost of the project and allowed to be passed through tariff. Expenditure on R&R activities is of capital nature and essential as reservoir, which supplies water to Power House for power generation, cannot be formed without inundation of land over which it is formed. The expenditure on R&R has not resulted in acquisition of any visible or freehold land, but is the cost of acquisition of reservoir and is a component of the cost of Dam/ Reservoir, which is to be amortized by way of depreciation to be charged over the life of the dam.

20. The reasons given by the petitioner are justified and therefore, the component of land and R&R amounting to Rs.170353 lakh is not excluded from the historical cost while calculating allowable depreciation for tariff computation.

21. The proportionate capital cost as on the date of commercial operation of each machine worked out by the petitioner as mentioned in para 10 above is on the basis of total anticipated capital expenditure of Rs.326388 lakh up to the completion of the generating station, which includes expenditure of Rs.31396 lakh on the balance works, instead of total capitalised expenditure of Rs. 294992 lakh as on 24.8.2005 when the dam was completed and MCR of all the eight machines was achieved. Further, reducing the capital cost on the date of commercial operation of each machine in the ratio of P1/P is conceptually wrong as the Commission, while determining the provisional tariff, applied the factor P1/P to Annual Fixed Charges

claimed by the petitioner to make the fixed charges payable commensurate to peak power generated and not to reduce the capital cost.

22. The capital cost based on the apportioned capitalised expenditure on the date of commercial operation of each machine and on completion of dam to be considered for calculation of tariff is as follows:

Period	Machines (Generating units)	Capital cost (Rs. In lakh)
Up to 13.1.2004	I	37668
14.1.2004 to 17.1.2004	I & II	65273
18.1.2004 to 5.3.2004	I to III	97503
6.3.2004 to 28.3.2004	I to IV	134843
As on 31.3.2004	I to IV	137852
29.3.2004 to 26.7.2004	I to V	162222
27.7.2004 to 31.10.2004	I to VI	195267
1.11.2004 to 6.1.2005	I to VII	231488
7.1.2005 to 29.3.2005	I to VIII	260542
30.3.2005 to 24.8.2005	Completion of dam & MCR	294992

23. The petitioner has submitted a list of assets amounting to Rs.9.50 lakh not in use and are proposed to be disposed off. Further, revenue from sale of infirm power amounting to Rs.39.93 lakh and Rs.0.96 lakh has been accounted for in the years 2003-04 and 2004-05.

24. The initial capital spares included in the project cost amounting to about Rs. 2500 lakh are within the ceiling norm of 1.5% of the admitted project cost of Rs. 294992 lakh.

25. The capital cost considered for computation of tariff is as under:

(Rs. in lakh)

Number of Machines	Period	Capital cost
1 Machine	14.1.2004 to 17.1.2004	37659.57
2 Machines	18.1.2004 to 5.3.2004	65233.35
3 Machines	6.3.2004 to 28.3.2004	97463.05
4 Machines	29.3.2004 to 31.3.2004	134803.23
4 Machines	01.4.2004 to 26.7.2004	137851.88
5 Machines	27.7.2004 to 31.10.2004	162181.72
6 Machines	1.11.2004 to 6.1.2005	195226.30
7 Machines	7.1.2005 to 29.3.2005	231446.84
8 Machines	30.03.2005 to 24.08.2005	260501.16
8 Machines	25.08.2005 onwards.	294991.98*

*After completion of dam and demonstration of MCR of 8 machines.

Extra Rupee Liability

26. The petitioner has not taken any foreign loan and has not claimed FERV.

Debt Equity Ratio

27. The financial package as on 24.08.2005 as submitted by the petitioner is in the ratio of debt-equity as below:

(Rs. In Lakh)

Particulars	Amount	
Total	296500	
Loan	161500	54.47%
NHPC - Equity	690.00	23.27%
GoMP - Equity	660.00	22.26%
Total - Equity	1350.00	45.53%

28. The petitioner has placed on record a copy of the letter dated 28.3.2002 which states that the equity in the power component would be Rs.135000 lakh to be shared between the petitioner and Govt. of Madhya Pradesh as Rs. 69000 lakh and Rs.66000 lakh respectively. Out of the petitioner's share, 2/3rd (Rs 46000 lakh) will be provided by the Central Government as budgetary support and balance 1/3rd will be provided by

NHPC from its internal resources. While awarding the provisional tariff, the Commission had considered debt-equity ratio of 70:30 by applying para 2 of Regulation 36 of the 2004 regulations, as amended. The petitioner has submitted that equity of 38% may be allowed in the interest of the public at large under second proviso to Regulation 36 of the 2004 regulations. The petitioner has stated that even after investment of Rs.115700 lakh by Govt. of Madhya Pradesh loan was not available and NHPC had to mobilise its own internal resources and contribute Rs.20000 lakh to start the work. Only on the strength of good progress of works after deploying this additional equity, the petitioner could manage to borrow money on short-term loan basis with interest rates ranging between 5.25% to 6.85%. Deployment of 38% equity has not only made it possible to commission the generating station ahead of schedule but it has also helped in achieving the financial closure at cheaper rates of interest. The petitioner has also stated that at the time of taking loan from the bankers, it was given to understand that the Annual Fixed Charges would be fixed on the basis of debt-equity ratio of 62:38 and revenue would be generated accordingly. The petitioner has claimed tariff on the basis of debt and equity ratio of 61.73:38.27.

29. Regulation 36 of the 2004 regulations, as amended, provides that :

(1) In case of the existing generating stations, debt–equity ratio considered by the Commission for the period ending 31.3.2004 shall be considered for determination of tariff:

Provided that in cases where the tariff for the period ending 31.3.2004 has not been determined by the Commission, debt-equity ratio shall be as may be decided by the Commission.

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(2) In case of the generating stations for which investment approval was accorded prior to 1.4.2004 and which are likely to be declared under commercial operation during the period 1.4.2004 to 31.3.2009, debt-equity in the ratio of 70:30 shall be considered:

Provided that where equity actually employed to finance the project is less than 30%, the actual debt and equity shall be considered for the purpose of determination of tariff.

Provided further that the Commission may in appropriate cases consider equity higher than 30% for the purpose of determination of tariff, where the generating company is able to establish to the satisfaction of the Commission that deployment of equity more than 30% was in the interest of general public;

(3) In case of the generating stations for which investment approval is accorded on or after 1.4.2004, debt-equity in the ratio of 70:30 shall be considered for the purpose of determination of tariff:

Provided that where equity actually employed is more than 30%, equity in excess of 30% shall be treated as notional loan.

Provided further that where deployment of equity is less than 30%, the actual debt and equity shall be considered for determination of tariff.

(4) The debt and equity amount arrived at in accordance with above clause (1), (2) or (3), as the case may be, shall be used for calculation of interest on loan, return on equity, advance against depreciation and foreign exchange rate variation.

30. The Annual Fixed Charges are determined on the basis of debt-equity ratio of 61.73:38.27 as approved by the Central Government.

Return on Equity

31. Return on equity at 16% for the period upto 31.3.2004 and at 14% for the period from 1.4.2004 onwards on the equity as mentioned below as on date of commercial operation of the respective machine is allowed :

(Rs in lakh)

Number of Machines	Period	Equity	Return on Equity
1 Machine	14.1.2004 to 17.1.2004	14412.43	25.20
2 Machines	18.1.2004 to 5.3.2004	24965.00	523.86
3 Machines	6.3.2004 to 28.3.2004	37299.40	373.03
4 Machines	29.3.2004 to 31.3.2004	51589.60	67.66
4 Machines	1.4.2004 to 26.7.2004	52756.32	2367.53
5 Machines	27.7.2004 to 31.10.2004	62067.42	2309.25
6 Machines	1.11.2004 to 6.1.2005	74713.68	1920.04
7 Machines	7.1.2005 to 29.3.2005	88575.39	2785.88
8 Machines	30.3.2005 to 31.3.2005	99694.57	76.48
8 Machines	01.4.2005 to 24.8.2005	99694.57	5582.90
8 Machines	25.8.2005 to 31.3.2006	112894.30	9483.12
8 Machines	1.4.2006 onwards	112894.30	15805.20

Interest on Loan:

32. The petitioner has claimed interest on loan in the following manner:

- (i) Notional loan @ 61.73% of the capital cost as on the date of commercial operation of the respective unit is considered as opening loan.
- (ii) Loan repayment has been considered from 18.1.2004 onwards.
- (iii) As only one syndicated loan has been availed at 7.6742% interest rate, the same rate of interest has been applied to the notional loan to arrive at the interest on loan for the respective period.

33. As per Regulation 3.5.1(a) of the 2001 regulations, interest on loan capital is computed on the outstanding loans duly taking into account the schedule of

repayment, as per the financial package approved by the Authority or an appropriate independent agency, as the case may be. The petitioner has submitted actual loan status as on the date of commercial operation of the respective machine up to the year 2005-06 only. The closing loan balances as on 31.3.2005 and 31.3.2006 are reconciled with the annual accounts submitted by the petitioner. In the year 2003-04, the petitioner has considered short-term SBI loan amounting to Rs.60000 lakh and inter-corporate loan from NHPC amounting to Rs. 25000 lakh and has excluded short-term loan from PNB (existing as per annual accounts) amounting to Rs. 5000 lakh, stating that it pertains to Omkareshwar project. The petitioner has stated that the loan amounting to Rs. 10341.34 lakh availed from Govt. of Madhya Pradesh (NVDA) existing as closing balance in annual accounts of 2002-03 is a grant contributed by the Government towards Irrigation and SSP component and therefore, has not been considered in computation of weighted average rate of interest.

34. The petitioner had undertaken special audit for preparing annual accounts for the generating station as on the date of commercial operation (25.8.2005). As the loans are being managed on corporate basis, the annual accounts of the generating station prepared as on the date of commercial operation do not have the loan schedules. So the loan status as submitted by the petitioner on 10.8.2006 has been considered for the determination of tariff.

35. The interest on loan for the period 14.1.2004 to 31.3.2004 has been worked out in the manner given hereunder:

- (a) The gross normative loan amount has been worked out on the basis of debt-equity ratio as mentioned in para 30 above.

(b) As the date of commercial operation of the generating station is after 31.3.2004, the repayment instalment up to 31.3.2004 has been considered as 'Nil'.

(c) On the basis of actual rate of interest on actual loans, considering repayment as per schedule, the weighted average rate of interest on average loan is worked out and the same is applied on the deemed average normative loan during the year to arrive at the interest on loan.

36. For the tariff period 2004-09, Regulation 38(i) of the 2004 regulations provides as under:

(a) Interest on loan capital shall be computed loan wise on the loans arrived at in the manner indicated in regulation 36.

(b) The loan outstanding as on 1.4.2004 shall be worked out as the gross loan as per regulation 36 minus cumulative repayment as admitted by the Commission up to 31.3.2004. The repayment for the period 2004-09 shall be worked out on a normative basis.

(c) The generating company shall make every effort to swap the loan as long as it results in net benefit to the beneficiaries. The costs associated with such swapping shall be borne by the beneficiaries.

(d) The changes to the loan terms and conditions shall be reflected from the date of such swapping and benefit passed on to the beneficiaries.

(e) In case of any dispute, any of the parties may approach the Commission with proper application. However, the beneficiaries shall not withhold any payment as ordered by the Commission to the generating company during pendency of any dispute relating to swapping of loan.

(f) In case any moratorium period is availed of by the generating company, depreciation provided for in the tariff during the years of moratorium shall be treated as repayment during those years and the interest on loan capital shall be calculated accordingly.

(g) The generating company shall not make any profit on account of swapping of loan and interest on loan.

37. The interest on loan for the period 2004-09 has been worked out as stated hereunder:

(a) The gross normative loan amount has been worked out on the basis of debt-equity ratio as per para 30 above.

(b) As the date of commercial operation of the generating station is after 31.3.2004, the repayment instalment up to the date of commercial operation (25.8.2005) has been considered as 'Nil'. Thereafter normative repayment has been worked out by the following formula :

Actual repayment of actual loan during the year

$$\frac{\text{Opening balance of actual loan during the year}}{\text{Opening balance of actual loan during the year}} \times \text{Opening balance of normative loan during the year}$$

38. Moratorium in repayment of loan has been considered with reference to normative loan and if the normative repayment of loan during the year is less than the depreciation including AAD during the year, depreciation including AAD during the year is deemed as normative repayment of loan during the year.

39. Weighted average rate of interest on actual loan worked out has been applied on the normative average loan during the year to arrive at the interest on loan.

40. The necessary calculations in support of weighted average rate of interest are appended to this order. The computations of interest on loan by applying weighted average rate are as follows :

For the period 14.1.2004 to 31.3.2004

(Rs. in lakh)

Deemed Loan	14.1.04 to 17.1.04	18.1.04 to 5.3.04	6.3.04 to 28.3.04	29.3.04 to 31.3.04
Deemed Outstanding loan	23247.14	40268.35	60163.65	83213.63
Adjustment due to FERV	0.00	0.00	0.00	0.00
Additions due to Additional Capitalisation	0.00	0.00	0.00	0.00
Opening balance after adjustment	23247.14	40268.35	60163.65	83213.63
Cumulative repayment of loan upto previous year	0.00	0.00	0.00	0.00
Opening balance	23247.14	40268.35	60163.65	83213.63
Additions	0.00	0.00	0.00	0.00
Repayments	0.00	0.00	0.00	0.00
Closing balance	23247.14	40268.35	60163.65	83213.63
Average loan	23247.14	40268.35	60163.65	83213.63
Wt. Average rate of Interest	6.68080%	6.90898%	7.06457%	7.07672%
Interest on Loan	16.97	364.87	267.10	48.27

For the period 1.4.2004 to 31.3.2009

(Rs. in lakh)

Interest on Loan	1.4.04 to 26.7.04	27.7.04 to 31.10.04	1.11.04 to 6.1.05	7.1.05 to 29.3.05	30.3.05 to 31.3.05	1.4.05 to 24.8.05	25.8.05 to 31.3.05	2006-07	2007-08	2008-09
Gross Normative Loan	85095.56	100114.30	120512.62	142871.45	160806.59	160806.59	182097.68	182097.68	182097.68	182097.68
Cumulative repayment of loan upto previous year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3824.22	10197.91	24522.89
Net Loan Opening	85095.56	100114.30	120512.62	142871.45	160806.59	160806.59	182097.68	178273.46	171899.77	157574.79
Repayments during the year	0.00	0.00	0.00	0.00	0.00	0.00	3824.22	6373.69	14324.98	14324.98
Net Loan closing	85095.56	100114.30	120512.62	142871.45	160806.59	160806.59	178273.46	171899.77	157574.79	143249.81
Average Loan	85095.56	100114.30	120512.62	142871.45	160806.59	160806.59	180185.57	175086.61	164737.28	150412.30
Wt. Average rate of Interest on Loan	6.9784%	7.1248%	7.4634%	7.6742%	7.6742%	7.6742%	7.6742%	7.6742%	7.6742%	7.6742%
Interest on Loan	1903.52	1895.61	1651.02	2463.20	67.62	4936.25	8296.68	13436.50	12642.27	11542.94

Depreciation

41. The petitioner has submitted revised workings of weighted average rate of depreciation on 10.8.2006 considering the gross blocks as on the date of commercial operation of the respective machine and the generating station. The depreciation rate

considered by the petitioner for assets covered under head “Construction plant and machinery” is 11.25% and for “Minor Assets” is 100%.

42. Depreciation for the period 14.1.2004 to 31.3.2004 and from 1.4.2004 to 31.3.2009 has been considered as per Regulation 3.5.1(b) of the 2001 regulations and Regulation 38(ii) (a) of the 2004 regulations respectively. The depreciation rates proposed by the petitioner have been considered for calculation of weighted average rate of depreciation, except under the heads “construction plant and machinery” and “Minor Assets”. The depreciation rate for “Construction Plant & Machinery” has been taken as 2.57% as per depreciation schedule in the 2001 regulations and the 2004 regulations and the rate for “Minor Assets” considered at 2.57% in line with generating stations of NHPC.

Advance Against Depreciation

43. The petitioner has not claimed advance against depreciation for the period up to 31.3.2004. As per Regulation 3.5.1(b)(iii) of the 2001 regulations, advance against depreciation in addition to allowable depreciation is permitted wherever originally scheduled loan repayment exceeds the depreciation allowable. As annual repayment of the normative loan is considered ‘Nil’, advance against depreciation for the period upto 31.3.2004 works out to be ‘Nil’.

44. Regulation 38(ii)(b) of the 2004 regulations provides that, in addition to allowable depreciation, the generating company shall be entitled to Advance Against Depreciation, computed in the manner given hereunder:

AAD = Loan repayment amount as per regulation 38 (i) subject to a ceiling of 1/10th of loan amount as per regulation 36 minus depreciation as per schedule

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;

Provided further 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.

45. For 2004-09, the petitioner has claimed advance against depreciation in the following manner:

- (i) 1/10th of gross loan is worked out from the gross notional loan as per para 37 above along with notional loan worked out.
- (ii) Cumulative loan as well as repayment of notional loan during the year has been considered as per para 37 above.
- (iii) Depreciation is considered as per para 41 above.
- (iv) Cumulative depreciation up to 2003-04 has also been considered.

46. In our calculations, advance against depreciation has been worked as detailed below:

- (i) 1/10th of gross loan is worked out from the Gross Notional Loan as per para 37 above.
- (ii) Repayment of notional loan during the year is considered as per para 37 above.

(ii) Depreciation is worked out as per para 41 above.

(iii) Cumulative depreciation up to year end is worked out considering depreciation up to the year of calculation excluding AAD of the year of calculation.

Operation & Maintenance Expenses

47. The petitioner has claimed the following O&M expenses at 1.5% of the proportionate capital cost as worked out by it, as indicated in para 10 above:

	(Rs. in lakh)					
Period	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
O&M expenses	203	2590	4253	4602	4786	4977

48. Since the capital cost as adopted by the petitioner has not been considered, O&M expenses have been worked out on the basis of accepted capital cost as on the date of commercial operation of each machine. Admitted capital cost up to the date of commercial operation of the 4th Machine as on 29.3.2004 is Rs. 134803 lakh.

49. O&M expenses for the period 14.1.2004 to 31.3.2004 works out as follows:

	(Rs in lakh)				
Period	14.1.04 to 17.1.04	18.1.04 to 5.3.04	6.3.04 to 28.3.04	29.3.04 to 31.3.04	Total for 2003-04
OM expenses (@1.5% p.a.)	6.17	128.33	91.87	16.57	242.95

50. The capital cost admitted as on 1. 4.2004 is Rs.137852 lakh and up to the date of commercial operation of the generating station as on 25.8.2005 is Rs.294992

lakh. Accordingly, O&M expenses @ 1.5% per annum of the corresponding capitalized cost for the period 2004-09 are allowed as below:

(Rs. In lakh)

Period	1.4.04 to 26.7.04	27.7.04 to 31.10.04	1.11.04 to 6.1.05	7.1.05 to 29.3.05	30.3.05 to 31.3.05	1.4.05 to 24.8.05	25.8.05 to 31.3.06	2006-07*	2007-08*	2008-09*
O&M expenses	662.82	646.51	537.54	779.94	21.41	1563.01	2654.93	4531.08	4712.32	4900.81

(Rs in lakh)

	2004-05	2005-06	2006-07*	2007-08*	2008-09*
O&M expenses (Year wise)	2648.22	4217.93	4531.08	4712.32	4900.81

* From year 2006-07 escalated @ 4% p.a.

Interest on working capital:

51. For the period 14.1.2004 to 31.3.2009 the maintenance spares are admissible at actuals but not exceeding one year's requirement less value of one fifth of initial spares already capitalized for the first five years. The petitioner has not claimed maintenance spares as a component of working capital for the period 14.1.2004 to 31.3.2004. Accordingly, the cost of maintenance spares for calculation of working capital is taken as "NIL".

52. For the tariff period 2004-09, the petitioner has claimed maintenance spares @ 1% of capital cost for year 2003-04 as the base year (not on the basis of the date of commercial operation i.e. 25.8.2005) and escalated the same @ 6% per annum.

(Rs in lakh)

	2004-05	2005-06	2006-07*	2007-08*	2008-09*
Maintenance spares (Year wise)	1756.11	2812.12	3126.91	3314.53	3513.40

*From year 2006-07 escalated @ 6% p.a.

53. Regulation 38(v)(a)(ii) of 2004 regulations provides for maintenance spares @ 1% of the historical cost escalated @6% per annum from the date of Commercial Operation. Based on the date of commercial operation of individual machines and the generating station, maintenance spares for the purpose of working capital have been calculated @ 1% of the corresponding capitalized cost as shown below:

Period	1.4.04 to 26.7.04	27.7.04 to 31.10.04	1.11.04 to 6.1.05	7.1.05 to 29.3.05	30.3.05 to 31.3.05	1.4.05 to 24.8.05	25.8.05 to 31.3.06	2004-05	2005-06	2006-07*	2007-08*	2008-09*
Maintenance spares	441.88	431.00	358.36	519.96	14.27	1042.00	1769.95	1765.48	2811.96	3056.12	3239.48	3433.85

*From 2006-07 and onwards escalated @ 6% P.A.

54. O&M expenses for working capital have been worked out for 1 month of O&M expenses considered in tariff for the respective period. Receivables have been worked out on the basis 2 months' of Annual Fixed Charges.

55. The petitioner has claimed 10.25% as the rate of interest on working capital up to 30.4.2004 and 10.75% thereafter. As per the regulations, rate of interest on working capital is 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 unit/station is declared under commercial operation, whichever is later. The interest on working capital is payable on normative basis notwithstanding that the generating company has not taken working capital loan from any outside agency. Accordingly, the SBI PLR as on 1.4.2004 (10.25%) has been considered as the rate of interest on working capital.

56. The details of working capital and the interest on working capital allowed is summarised below:

(Rs in lakh)

Particulars	14.1.04 to 17.1.04	18.1.04 to 5.3.04	6.3.04 to 28.3.04	29.3.04 to 31.3.04	1.4.04 to 26.7.04	27.7.04 to 31.10.04	1.11.04 to 6.1.05	7.1.05 to 29.3.05	30.3.05 to 31.3.05	1.4.05 to 24.8.05	25.8.05 to 31.3.05	2006-07	2007-08	2008-09
Maintenance spares- Annual basis	0.00	0.00	0.00	0.00	1378.51	1621.80	1952.26	2314.46	2604.28	2605.00	2949.92	3056.12	3239.48	3433.85
O&M expenses- monthly- annual	47.07	81.54	121.83	168.50	172.31	202.73	244.03	289.31	325.61	325.63	368.74	377.59	392.69	408.40
Receivables- annual basis	888.31	1555.71	2340.31	3236.93	3142.41	3718.24	4544.97	5439.84	6126.06	6124.74	6913.39	6867.05	7029.96	7964.01
Total Working Capital	935.38	1637.25	2462.14	3405.43	4693.24	5542.77	6741.26	8043.61	9055.95	9055.37	10232.05	10300.76	10662.13	11806.26
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%	10.25%
Interest on Working capital	1.05	22.01	15.86	2.86	154.20	150.98	126.84	185.22	5.09	371.27	629.27	1055.83	1092.87	1210.14

Capacity Index

57. The generating station has been treated as run-of-river with pondage when dam was partially complete. After completion of dam with gates, it has been treated as storage type power station. Normative Capacity Index in both the cases is 85%.

58. Though the Maximum Continuous Rating of each machine is 125 MW, the maximum output (MW) actually available on the date of commercial operation of each machine before the completion of the dam based on the height of dam constructed, that is, head available for generation of power was as follows :

Unit	COD	Maximum output P1 (MW) 14.1.2004 to 26.7.2004	Maximum output P1 (MW) 27.7.2004 to 24.8.2005	Maximum output P1 (MW) 25.08.2005 onwards
Unit-I	14.1.04	82.81	106.82	125
Unit-II	18.1.04	82.81	106.82	
Unit-III	6.3.04	82.81	106.82	
Unit-IV	29.3.04	82.81	106.82	
Unit-V	27.7.04		106.82	
Unit-VI	1.11.2004		106.82	
Unit-VII	7.1.2005		106.82	

Unit-VIII	30.3.2005		106.82	
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59. Further the peaking capability of the generating station shall vary from month to month, depending upon the variation in water level at the Indira Sagar reservoir, which as per TEC of the project, would be as follows:

Month	Peaking capability (MW)
April	922
May	852
June	765
July	912
August	1000
September	1000
October	1000
November	1000
December	1000
January	1000
February	1000
March	979

60. Based on the information at paras 58 and 59 above, P1/ P to be applied for annual fixed charges as on the date of commercial operation of various machines from 14.1.2004 to 24.8.2005 is as given below:

Period	Machine	P1/P ratio
14.1.2004 to 17.1.2004	I	0.6625
18.1.2004 to 5.3.2004	I – II	0.6639
6.3.2004 to 28.3.2004	I – III	0.6767
29.3.2004 to 31.3.2004	I – IV	0.6767
1.4.2004 to 26.7.2004	I – IV	0.7695
27.7.2004 to 31.10.2004	I – V	0.8585
1.11.2004 to 6.1.2005	I – VI	0.8545
7.1.2005 to 29.3.2005	I – VII	0.861
30.3.2005 to 31.3.2005	I – VIII	0.8728
1.4.2005 to 24.8.2005	I – VIII	0.9583
25.8.2005 onwards	I – VIII	1.00

ANNUAL FIXED CHARGES

61. The statements showing summary of the capital cost and other related matters for the periods 14.1.2004 to 31.3.2004 and 1.4.2004 to 31.3.2009 are annexed to this

order. The annual fixed charges for the periods 14.1.2004 to 31.3.2004 and 1.4.2004 to 31.3.2009 allowed in this order are summed up as below:

I. For the period 14.1.2004 to 31.3.2004

(Rs. in lakh)

Particulars	14.01.2004 to 17.01.2004	18.1.2004 to 05.3.2004	06.3.2004 to 28.3.2004	29.3.2004 to 31.3.2004
Interest on Loan	16.97	364.87	267.10	48.27
Interest on Working Capital	1.05	22.01	15.86	2.86
Depreciation	8.85	185.10	132.55	23.83
Advance Against Depreciation	0.00	0.00	0.00	0.00
Return on Equity	25.20	523.86	375.03	67.66
O & M Expenses	6.17	128.33	91.87	16.57
TOTAL	58.25	1224.17	882.41	159.19
P1/P	0.6625	0.6639	0.6767	0.6767
AFC allowed	38.59	812.72	597.13	107.73

II. For the period 1.4.2004 to 31.3.2009

(Rs. in lakh)

	1.4.2004 to 26.7.2004	27.7.2004 to 31.10.2004	1.11.2004 to 6.1.2005	7.1.2005 to 29.3.2005	30.3.2005 to 31.3.2005	1.4.2005 to 24.8.2005	25.8.2005 to 31.3.2006	2006-07	2007-08	2008-09
Depreciation	955.70	926.45	770.26	1118.37	30.81	2245.96	3824.22	6373.69	6373.69	6373.69
Interest on Loan	1903.52	1895.61	1651.02	2463.20	67.62	4936.25	8296.68	13436.50	12642.27	11542.94
Return on Equity	2367.53	2309.25	1920.04	2785.88	76.48	5582.90	9483.12	15805.20	15805.20	15805.20
Advance against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1553.40	7951.29
Interest on Working Capital	154.20	150.98	126.84	185.22	5.09	371.27	629.27	1,055.83	1,092.87	1,210.14
O & M Expenses	662.82	646.51	537.54	779.94	21.41	1563.01	2654.93	4531.08	4712.32	4900.81
Total	6043.77	5928.81	5005.69	7332.61	201.40	14699.38	24888.22	41202.30	42179.75	47784.08
P1/P	0.7695	0.8585	0.8545	0.8610	0.8728	0.9583	1.0000	1.0000	1.0000	1.0000
AFC allowed	4650.68	5089.88	4277.36	6313.38	175.79	14086.42	24888.22	41202.30	42179.75	47784.08

Primary Energy Rate

62. Primary energy rate for the period 14.1.2004 to 31.3.2004 shall be governed by Regulation 3.5.3 of the 2001 regulations whereby rate of primary energy for all hydro stations, except for pumped storage stations, is to be taken as 90% of the lowest of variable charges of the central sector thermal power stations in the concerned region. The petitioner has stated that Korba Super Thermal Power Station has the lowest

variable charge (41.03 Paise/kWh) amongst the thermal power stations of Western Region. Accordingly, primary energy rate of 41.03 Paise/kWh shall be applicable for the generating station for the period 14.1.2004 to 31.3.2004.

63. The primary energy rate for the tariff period 2004-09, as per Regulation 39 (2) of the 2004 regulations, for all hydro stations, except for pumped storage stations, shall be equal to average of the lowest of variable charges of the central sector thermal power stations of the concerned region for all months of the previous year. Based on the monthly variable charges of Korba STPS furnished by WREB, the following primary energy rates for the years 2004-05 to 2006-07 are allowed for the generating station:

Year	Paise/kWh)
2004-05	48.78
2005-06	51.14
2006-07	55.48

64. As per Regulation 39 (3) of the 2004 regulations, the secondary energy rate shall be equal to primary energy rate.

65. Govt of Madhya Pradesh has accorded approval to forego claim of 12% free power to home state and the entire power generated from the generating station is being supplied to MPSEB at the tariff determined by the Commission. Accordingly, PPA has been made between the petitioner and MPSEB.

Design Energy

66. The quantum of energy generated in excess of the design energy at the generating station on annual basis is the secondary energy. The annual design

energy for the years 2003-04 to 2005-06 shall be as given below and ex-bus scheduled generation over and above the design energy shall be treated as secondary energy:

Year	Design Energy (MUs)
2003-04	121.93
2004-05	1361.75
2005-06	1521.23

2006-07 to 2008-09	
Month	Design Energy (MUs)
April	162.63
May	168.06
June	162.63
July	168.05
August	168.04
September	162.62
October	168.07
November	162.65
December	168.06
January	168.05
February	151.80
March	168.04
Total	1978.69

67. 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.

68. 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 statutory authority and other charges in accordance with the 2001 and 2004 regulations, as applicable.

69. The petitioner is already billing the respondents on provisional basis in accordance with the interim orders of the Commission. The provisional billing of tariff shall be adjusted in light of the final tariff now approved by us.

70. This order disposes of Petition No. 119/2005

Sd/-
(A.H.JUNG)
MEMBER

Sd/-
(BHANU BHUSHAN)
MEMBER

Sd/-
(ASHOK BASU)
CHAIRPERSON

New Delhi, dated the 6th February, 2007

Summary Sheet

Name of the Company:		NHDC				
Name of the Power Station:		Indira Sagar HEP				
DOCO		25.8.2005				
Petition No.:		119/2005				
Tariff Period :		2004-09				
					(Rs.in lacs)	
1	Admitted Capital Cost as on 25.8.2005 for Calculation of Debt and Equity				294991.98	
2	Additional Capitalisation(works)				0.00	
	2001-02				0.00	
	2002-03				0.00	
	2003-04				0.00	
	Assets not in use as on 1.4.2004				0.00	
	Total				0.00	
3	Additional Capitalisation(FERV)				0.00	
	2001-02				0.00	
	2002-03				0.00	
	2003-04				0.00	
	Total				0.00	
4	Total Capital Cost as on 1.4.2004				294991.98	
5	Means of Finance ¹ :					
	Debt			61.73%	182097.68	
	Equity			38.27%	112894.30	
	Total			100.00%	294991.98	
6	Gross Loan as on 1.4.2004				182097.68	
7	Cumulative Repayment upto 31.3.2009 :				38847.87	
	Repaid upto 31.3.2004				0.00	
	From 1.4.2001 to 31.3.2004 (ACE & FERV)				0.00	
	From 1.4.2004 to 31.3.2009				38847.87	
	Total				38847.87	
8	Balance Loan to be repaid beyond 31.3.2009 :				143249.81	
9	Depreciation recovered upto 31.3.2009 :				38847.87	
		Dep	AAD	Total		
	Recovered upto 31.3.2004			350.34	0.00	350.34
	From 1.4.2001 to 31.3.2004 (ACE & FERV) / Assets not in use as on 1.4.2004 / Deletions			0.00	0.00	0.00
	From 1.4.2004 to 31.3.2009			28992.84	9504.69	38497.53
	Total					38847.87
10	Balance Depreciation to be recovered beyond 31.3.2009 :				226580.46	
	Capital cost for the purpose of Depreciation				294991.98	
	ACE + FERV				0.00	
	Capital cost as 1.4.2004				294991.98	
	Less: Land Cost				71.61	
					294920.37	
	90% of Capital Cost as above				265428.33	
	Cum. Depreciation to be recovered upto 31.3.2009				38847.87	
	Balance Depreciation to be recovered beyond 31.3.2009				226580.46	