

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

1. **Shri Bhanu Bhushan, Member**
2. **Shri R. Krishnamoorthy, Member**

Petition No.107/2006

In the matter of

Approval of final tariff in respect of Dhauliganga Hydroelectric Project Stage-I (4x70MW) of National Hydroelectric Power Corporation Limited for the period from 1.10.2005 to 31.3.2009.

And in the matter of

National Hydroelectric Power Corporation Limited

.....**Petitioner**

Vs

1. Punjab State Electricity Board, Patiala
 2. Delhi Transco Limited, Delhi
 3. Haryana Vidyut Prasaran Nigam Limited, Panchkula
 4. Uttar Pradesh Power Corporation Limited, Lucknow
 5. Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur
 6. Jaipur Vidyut Vitaran Nigam Limited, Jaipur
 7. Jodhpur Vidyut Vitaran Nigam Limited, Jodhpur
 8. Ajmer Vidyut Vitaran Nigam Limited, Ajmer
 9. Power Transmission Corporation of Uttaranchal Limited, Dehradun
 10. Himachal Pradesh State Electricity Board, Shimla
 11. Chief Engineer & Secretary, Engineering Deptt, UT of Chandigarh
 12. Power Development Department, J & K, Srinagar
- **Respondents**

The following were present

1. Shri Cherian Mathew, NHPC
2. Shri. P Kumar, NHPC
3. Shri. Prashant Kaul, NHPC
4. Shri. Ansuman Ray, NHPC
5. Shri. R S Batra, NHPC
6. Shri. R P Goyal, NHPC
7. Shri. Naveen Samriya, NHPC
8. Shri. C Vinod, NHPC
9. Shri. S K Meena, NHPC

10. Shri. Jayant Verma, UPPCL
11. Shri. TPS Bawa, PSEB
12. Shri. R K Arora, HPGCL
13. Shri. A S Chauhan, JVVNL

ORDER
(Date of hearing: 29.5.2007)

The petitioner has filed this petition for approval of final tariff in respect of Dhauliganga Hydroelectric Project Stage-I (4x70MW) for the period 1.10.2005 to 31.3.2009 in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004 (hereinafter referred to as "the Tariff Regulations 2004").

2. Dhauliganga Hydroelectric Project located in Pithoragarh district of Uttaranchal is a run-of-river hydro scheme with diurnal pondage for providing more than 3 hours of peaking. The Project has 56 m high concrete rockfill dam with FRL at EL 1345 m and MDDL at EL 1330 m. The Project is designed to produce annual energy generation of 1134.7 MU in a 90% dependable year. As per the scheme approved by the Government of India, 12% of the energy generated at bus bars is to be supplied free of cost to the home State of Uttaranchal.

3. The generating station has 4 units which were declared under commercial operation as under:

- | | | | |
|-----|------------------|---|-----------|
| (a) | Unit III | - | 1.10.2005 |
| (b) | Units I, II & IV | - | 1.11.2005 |
| (c) | Station COD | - | 1.11.2005 |

4. Prior to the commercial operation of the generating station, the petitioner had filed Petition No. 20/2005 for approval of provisional tariff for the generating station. The Commission, by order dated 25.10.2005, had allowed provisional tariff @ 183 paise/kWh from the date of commercial operation of the Unit-III, i.e. from 1.10.2005. The provisional tariff was based on consensus arrived between the petitioner and the constituents of Northern Region at the NREB meeting held on 26.2.2005. The Commission also approved provisional Annual Fixed Charge (AFC) of Rs.18055 lakh for the year 2005-06. The provisional tariff and the Annual Fixed Charge of Rs.18055 lakh had been extended up to 31.7.2007 or till such time the final tariff is approved by the Commission, whichever is latter. Considering the fact that the petitioner's claim for AFC of Rs.17297.84 lakh for 2006-07 and Rs.17369.73 lakh for 2007-08 is less than the provisionally approved AFC of Rs.18055 lakh, the Commission by its order dated 23.3.2007 revised the provisional AFC to Rs.17369.73 lakh with effect from 1.4.2007.

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

Sl. No	Components of AFC	2005-06		2006-07	2007-08	2008-09
		1.10.05 to 31.10.05*	1.11.05 to 31.3.06*			
1.	Depreciation	84.80	1657.68	4006.95	4006.95	4006.95
2.	Interest on Loan	83.77	1642.02	3946.53	3895.83	3789.32
3.	Return on Equity	129.73	2527.62	6109.81	6109.81	6109.81
4.	Advance against Depreciation	0.00	0.00	0.00	0.00	0.00
5.	Interest on Working Capital	10.30	206.40	508.64	522.19	535.58
6.	O & M Expenses	55.48	1084.33	2725.91	2834.95	2948.35
Total		364.07	7118.05	17297.84	17369.73	17390.01

* Fixed charges only for the given period

6. The details of working capital claimed by the petitioner are given hereunder:

(Rs. in lakh)

Period	01.10.2005 to 31.10.2005	01.11.2005 to 31.03.2006	2006-07	2007-08	2008-09
Spares	435.48	1747.38	1852.22	1963.35	2081.15
O&M expenses (1 month)	55.48	218.42	227.18	236.25	245.70
Receivables	714.83	2867.06	2882.97	2894.95	2898.33
Total Working Capital	1205.79	4832.86	4962.35	5094.55	5225.18
Rate of Interest	10.25%	10.25%	10.25%	10.25%	10.25%
Interest	10.30	206.40	508.64	522.19	535.58

7. Replies to the petition have been filed by the PSEB, JoVVNL, JVVNL and AVVNL. We have also heard the representatives of the petitioner and the respondents.

Delay in Completion of Project

8. The original capital cost of the generating station, as approved by the Government of India by its letter dated 8.4.1991, was Rs.60198 lakh including IDC of Rs.8453 lakh at December 1989 price level with the scheduled date of completion as October 1998. The project cost was subsequently revised by the Government of India letter dated 7.7.2000 to Rs.157831.22 lakh including IDC and FC of Rs.14687 lakh at August 1999 price level with the scheduled date of completion as March 2005.

9. The petitioner was directed by the Commission vide order dated 23.2.2007 to submit the reasons for delay of 7 years in the commissioning of the project with reference to the scheduled date in original approval and the delay of

7 months with reference to the scheduled date in RCE approval. The petitioner in its affidavit dated 14.3.2007 has explained the reasons for time overrun as under:

(a) As regards the time overrun with reference to the original schedule of commissioning, the petitioner has explained that the construction of the project except for some small infrastructure work could not be taken up due to paucity of funds. During 1994 the project was posed to JBIC, Japan (formerly OECF) for funding. JBIC after thorough appraisal found the project fit for funding which as per the JBIC rules was restricted to 85% of the project cost. Based on detailed rate analysis as per CWC guidelines and the tendered cost of all civil works at Nathpa Jhakhri project, the petitioner decided on an anticipated project cost of Rs. 188149 lakh including IDC of Rs. 13770 lakh. The proposal for sanction of revised cost estimate was considered by the Ministry of Power in pre-PIB meeting held in April 1997 and it was decided that the petitioner should work out the revised cost based on bids received for various packages in order to achieve a degree of firmness and finality in the revised cost estimate. Accordingly, the petitioner invited global bids for various packages and based on the assessment of the bid cost, the revised cost of the project was recommended by PIB for consideration of the CCEA. Actual loan disbursement by JBIC started in 1997-98 for Trench-I, in 1999-2000 for Trench-II and in the year 2004-05 for Trench-III. Thus, actual work of the project started after materialization of loan disbursement and award of work during 1999-2000. Government of India, MOP issued the sanction for

revised cost estimates amounting to Rs.157831.22 lakh (Aug 1999 price level) on 7.7.2000.

(b) As regards the delay in commissioning with reference to the date of approval of revised cost estimate, the petitioner has submitted that though the generating station was ready for commissioning as per the schedule, it was delayed as the Dhauliganga-Bareilly transmission line of the PGCIL was available for necessary testing, commissioning and evacuation of power to the grid only on 22.7.2005. After the line was available, Units IV and III of the generating station were synchronized with the Northern grid on 26.7.2005 and 28.7.2005 respectively followed by the remaining two Units. After trial runs for maximum continuous rating and installed capacity were successfully carried out, one machine (Unit III) was declared under commercial operation on 1.10.2005 and the remaining three machines (Units I, II & IV) on 1.11.2005.

10. We are of the view that the time taken for completion of the project was on account of the circumstances beyond the control of the petitioner for which the petitioner cannot be held responsible and penalized.

Capital cost on the date of commercial operation

11. The petitioner has claimed the capital cost based on the audited annual accounts for the year 2005-06 in which the generating station was commissioned. The apportioned expenditure capitalized as on COD of Unit III and of the remaining three Units is summarized below:

(Rs. Lakhs)

Period of tariff & Units	1.10.2005 (As on COD of Unit III)	1.11.2005 (As on COD of Units-I, II & IV and COD of Station)
Capital Cost on which tariff has been claimed	43547.77	174737.70

12. The capital cost of Rs.174737.70 lakh claimed by the petitioner includes price escalation of Rs.11069 lakh, un-discharged liabilities of Rs. 3140.45 lakh as on COD of Unit III and Rs.11598.04 lakh as on COD of the generating station, IEDC of Rs. 51514.17 lakh, FERV of Rs.2036 lakh and Entry Tax of Rs. 153 lakh.

Escalation of cost

13. The petitioner has explained vide its affidavit dated 14.3.2007 that the Government of India approval for RCE included an amount of Rs. 8127.22 lakh on account of physical contingency @ 10% of civil works and 5% of electrical works which were actually met on the project. However, the RCE approval did not provide for the contingency on account of price escalation and hence escalation is required to be provided on certain components as per clauses of the contract. As such the expenditure of Rs.11069 lakh on account of price escalation is over and above the expenditure incurred on account of physical contingency. The petitioner has furnished the details of the assets/works on which price escalation has been claimed, as under:

(Rs. In lakh)

S. No.	Work/Asset	Package	Amount
1.	Dam & Barrage, Power Tunnel & Pipeline, Access Road to Dam	Lot – 1	5471
2.	Building containing Hydroelectric Generating Plant, Power Tunnel & Pipeline, Tail Race Tunnel, Access Road to Surge Shaft	Lot – 2	3769
3.	Main generating equipment, generator step of transformer, cooling water system, DC battery, power and control cables, PLCC, control metering and protection, miscellaneous power plant equipment, switchgear including cable	Lot – 3	960
4.	Hydro mechanical work – Dam & Barrage, Hydro mechanical work – Tunnel & Channel, Hydro mechanical work – Tail Race & Draft Tube gates	Lot – 4	869
	Total		11069

14. On perusal of the contract, we are satisfied that since the RCE was approved in the year 2000, it was not reasonably possible to anticipate the price escalation and to take care of the contingency, provision for price escalation has been included in the contract in respect of the above 4 packages. Accordingly, we allow Rs.11069 lakh to be included in the completion cost of the project on account of escalation of price.

Un-discharged Liabilities

15. The petitioner has submitted that the project cost of Rs.174737.70 lakh also includes the un-discharged liability/balance payment amounting to of Rs. 3140.45 lakh as on COD of Unit III and Rs.11598.04 lakh as on COD of the generating station. The details of the un-discharged liabilities are as under:

S. No.	Work	Amount (Rs. in lakh)
1.	Mains works regarding building containing GPM and waterways, construction of dam and desilting basin, supply & erection of E&M and hydro-mechanical equipment etc.	10467.33
2.	Minor works	419.37
3.	Interest accrued but not due as on 1.11.2005	711.34
	Total	11598.04

16. In our view, since payments for the un-discharged liabilities have not been made as on COD, they do not qualify as part of the capital cost on COD of station. Accordingly, an amount of Rs.3140.95 lakh towards un-discharged liabilities/balance payment as on 1.10.2005 and Rs.11598.04 lakh as on COD of the station are not allowed to be included in the capital cost of the project for the purpose of tariff. However, the petitioner is at liberty to include the expenditure in the additional capitalization in the subsequent years as and when the payments are made.

17. In addition to un-discharged liabilities, the petitioner has also submitted that the capital works in progress amounting to Rs.2736 lakh and liabilities to meet the award of arbitration amounting to Rs.8917 lakh will be claimed by the petitioner in future.

IEDC

18. The capital cost of Rs.174737.70 lakh claimed by the petitioner also includes IEDC amount of Rs.51514.17 lakh (as on 1.4.2005). The major items of IEDC claimed by the petitioner are as under:

(Rs. in lakh)

Ser No	Major Items	Amount
1	Employee Cost	19954.14
2	Repairs & maintenance	2150
3	Administrative Expenses	14877
4	Interest & Finance Charges (IDC & FC)	12896
5	ERV	1200
6	Depreciation	2066

19. The petitioner has claimed IEDC amount of Rs.51514.17 lakh as part of the capital cost which includes the employee cost of Rs.19954.14 lakh. During the hearing on 22.2.2007, the respondents had argued that after approval of the revised cost estimate in July 2000, the project was being executed on turnkey basis. As such the employee cost of Rs.19954.14 lakh appears to be on the higher side and should not be allowed to be capitalized. In response to the directions of the Commission, the petitioner in its affidavit dated 14.3.2007 has submitted the year-wise details of employee cost from the year 1989-90 to 2005-2006, which is extracted as under:

(Rs. In lakh)

S. No.	Year	Employee cost
1.	1989-90	7.10
2.	1990-91	22.33
3.	1991-92	28.38
4.	1992-93	70.35
5.	1993-94	59.35
6.	1994-95	195.04
7.	1995-96	260.76
8.	1996-97	454.03
9.	1997-98	757.66
10.	1998-99	1331.84

11.	1999-00	1475.94
12.	2000-01	2681.61
13.	2001-02	2684.17
14.	2002-03	2846.56
15.	2003-04	3209.59
16.	2004-05	2704.74
17.	2005-06	1164.66
	Total	19954.14

20. It is observed from the data furnished by the petitioner that while the employee cost was a meager Rs.7 lakh in the year 1989-90, it has risen to Rs.260 lakh in 1995-96 and to Rs.3209.59 lakh during 2003-04. The petitioner has explained that the pay structure of the employees of the Corporation was revised w.e.f. 1.1.1997 and actual disbursement of arrears was done in 2000-01 onwards as a result of which there was marked increase in expenditure on account of salary, wages and allowances. Introduction of post-retirement medical benefits to the employees also contributed towards increase in the employee cost. Moreover, the project is situated 310 km. away from the nearest rail head and as the construction activity increased, executive/non-executives were required to visit Corporate office and other places in connection with the official work which resulted in enhanced traveling and conveyance expenses.

21. We have considered the reasons furnished by the petitioner on account of employee cost and find it to be plausible. Moreover, the expenditure on account of employee cost is spread over a long period of construction of 17 years from 1989-90 to 2005-06. Accordingly, we allow the expenditure of Rs.19954.14 lakh on account of employee cost to be included in the capital cost.

22. The petitioner has clarified that the administrative expenses of Rs.14877 lakh includes expenses on rent, rates and taxes, insurance, security, electricity charges, traveling and conveyance, vehicles & staff cars, telephone, telex, postage, advertisement & hospitality, auditor fee, losses on assets, compensatory afforestation & catchment area treatment etc. At the hearing, clarifications were sought from the petitioner with regard to expenditure incurred on design and foreign consultancy and land not belonging to the Corporation. The petitioner vide affidavit dated 14.3.2007 has submitted that the expenditure of Rs.1734.95 lakh on design and foreign consultancy includes the consultancy services rendered by M/s Electrowatt Engineers and Nippon Koei and transfer of technology by the firms as per the consultancy contract awarded to them. As regards the expenditure of Rs.7937 lakh on land not belonging to the Corporation, the petitioner has clarified that the expenditure was on account of widening and strengthening of roads and bridges for transportation of equipments/materials etc., construction of foot paths for accessing various work sites, miscellaneous civil works on land not owned by the petitioner corporation and maintenance of Tawaghat-Chirkila road owned by State PWD as access road to dam site.

23. After prudence check on various expenses claimed by the petitioner under the head Capital Cost, we have decided not to allow the un-discharged liabilities of Rs.3140.45 lakh as on COD of Unit III and Rs.11598.04 lakh as on COD of the generating station as part of the capital cost. However, entry tax of Rs. 153 lakh on account of additional legislation such as insurance and DRB fees being

compulsory expenditure are allowed to be included in the capital cost. Accordingly, the following capital expenditure as on the date of commercial operation of the generating station is allowed:

(Rs. in lakh)		
Period of tariff & Units	As on 1.10.2005 (COD of Unit III)	As on 1.11.2005 (COD of the Station)
Capital Cost	40407.32	163139.66

Infirm power

24. The petitioner has submitted that the capital cost of Rs.174737.70 lakh claimed in the petition has been worked out after reducing the amount of Rs.522.92 lakh billed as infirm power in accordance with the Tariff Regulations of 2004.

Initial Spares

25. As per the Regulation 33 of Tariff Regulations 2004, final tariff of a generating station shall be determined based on the admitted capital expenditure incurred up to COD of the station and shall include initial capital spares subject to ceiling norm of 1.5% of the original project cost as on cut off date.

26. The petitioner, vide his affidavit dated 14.3.2007, has submitted that total value of mandatory spares amounting to Rs.837.81 lakh have been included in the packages of Lot-3 (Contract for supply of main generating plant equipment, Auxiliary & Ancilliary equipment, generator transformer etc) and Lot-4 (Hydro-mechanical equipment of dam, HRT,TRT, draft tube gates etc.). The value of

mandatory spares works out to less than 1.5% of the admitted capital cost of Rs.163139.66 lakh on COD of the station and is, therefore, allowed to be capitalized.

Additional capital expenditure from the date of commercial operation against committed liabilities

27. The petitioner has claimed undischarged liability for an amount of Rs.11598.04 as part of the capital cost. We have already decided that the undischarged liabilities can not be capitalized till the payments for the same are made, and as and when discharged, the petitioner can claim them as additional capital expenditure. The petitioner vide its affidavit dated 20.8.2007 has furnished the details of liabilities discharged till 31.5.2007 which are summarized as under:

Ser No.	Work	Name of Party	Deferred liability as on 1.11.2007	Liabilities discharged during 2005-06	Liabilities discharged during 2006-07
1	Construction of building containing GPM and Waterways	Samsung Corporation	580.92	531.35	110.01
2	Construction of buildings containing GPM and Waterways	Hindustan Construction Company	180.01	135.41	56.69
3	Construction of dam and desilting basin	Kajima Daewoo Joint Venture	5577.47	3682.42	1430.76
4	Supply and erection of Electro-mechanical Equipments	Alstom Projects India Ltd	1627.94	719.45	620.98
5	Supply and erection of Electro-mechanical Equipments	Alstom Hydro Power	1547.31	1241.81	283.90
6	Supply and erection of Hydro-mechanical Equipments	DSD Industrienanlagen GmbH	953.68	235.99	454.87
7	Minor Works	Various Parties	419.37	-	245.34
8	Inerest accrued but not due	-	711.34	711.34	-
	Total		11598.04	7257.77	3202.55

Thus, total amount of Rs.10460.32 lakh has been discharged during 2005-06 and 2006-07 against the undischarged liability of Rs.11598.04 lakh stated to be as on COD of the station. Accordingly, Rs.10460.32 lakh is allowed as Additional Capital Expenditure.

28. In view of our decision in the preceding paragraphs, we allow the following capital cost during the tariff period 2004-09 for the purpose of tariff:

(Rs in lakh)

Ser	Particulars	As on 1.10.2005	As on 1.11.2005	2005-06	2006-07
1	Opening gross block	40407.32	163139.66	163139.66	170397.44
2	Additional capital expenditure	-	-	7257.77	3202.55
3	Closing gross block	40407.32	163139.66	170397.44	173599.99

Debt-Equity Ratio

29. Clause 2 of Regulation 36 of the Tariff Regulations, 2004, as amended, provides as follows:

“(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 and 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 determination of tariff:

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

30. The petitioner has submitted the financing of the capital cost up to the date of commercial operation, in Annexure to Form-1 of the tariff petition, as under:

(Rs in lakh)			
Sl.No.	Particulars	Amount	percentage
1	Capital Expenditure as on 1.11.2005	174737.70	100
2	Equity	43641.48	24.98
3	Loans	119538.56	68.41
4	Undischarged Liabilities	11598.04	6.64
5	Total Funding	174778.08	100.02
6	Difference	40.38	

31. The Govt. of India, in its letter dated 8.4.1991, while according approval of the completion cost of the generating station has stated that the capital investment will be met by equity and loan in the ratio of 1:1. Moreover, the Govt. of India letter dated 7.7.2000 approving the revised cost of the generating station mentions the funding of the capital cost of the project in the debt equity ratio of 2.61:1 (i.e.72.30: 27.70). In Form No. 6, the petitioner has mentioned the debt-equity ratio of 2.74:1(i.e. 73.26:26.74) which is stated to be worked out on the basis of the financial package as on the date of commercial operation without considering the deferred liabilities.

32. Since the equity actually deployed is less than 30% of the project cost, the case is covered under first proviso to clause (2) of regulation 36 and accordingly, actual equity and debt in the gross block have been considered for determination of tariff. We have already allowed Rs.7257.77 lakh and Rs.3202.55 lakh as Additional Capital Expenditure for 2005-06 and 2006-07 respectively after the liabilities were discharged during the respective years. The Commission in its

order dated 15.10.2007 in Review Petition No.77/2007 in Petition No.128/2006 on consideration of the provisions of regulations 53 and 54 of Tariff Regulations, 2004 decided the question of apportionment of additional capital expenditure between debt and equity in respect of transmission tariff as under:

“12. The language used in the substantive provision of clause (2) of Regulation 54 makes it explicit that the general rule or the norm for debt equity ratio for the purpose of determination of tariff is 70:30. Thus, as per the substantive provisions of Regulation 54, norm for debt-equity ratio should be 70:30. Note 1 below Regulation 53 lays down that for additional capital expenditure, normative debt-equity ratio is to be adopted. It, therefore, follows that the additional capital expenditure, irrespective of the source of financing is to be apportioned between debt and equity in the ratio of 70:30, which is the “normative” debt-equity ratio. This principle of interpretation has been followed by the Commission while fixing tariff for the transmission line. We may also add that the resultant equity works out to 23.18% on overall basis which is less than the normative equity of 30%.”

33. Regulations 35 and 36 pertaining to tariff of hydro generating stations are *pari materia* with the provisions of regulations 53 and 54. In terms our order dated 15.10.2007 in Review Petition No.77/2007 in Petition No. 128/2006, the additional capital expenditures have been allocated between debt and equity in the normative ratio of 70:30.

34. The capital cost and the additional capital expenditure have been allocated between debt and equity as under:

(Rs in lakh)

Ser No	Item	As on 1.11.2005	Debt-equity ratio(%)	Debt	Equity
1	Capital Cost(less undischarged liabilities)	163139.66	73.25:26.75	119498.18	43641.48
2	Additional Capital Expenditure(Discharged liabilities)	10460.32	70:30	7322.22	3138.10
3	Capital Cost	173599.98	73.05:26.95	126820.40	46779.58

Return on Equity

35. As per clause (iii) of Regulation 38 of the Tariff Regulations, 2004, return on equity shall be computed on the equity base determined in accordance with regulation 36 @ 14% per annum. Equity invested in foreign currency is to be allowed a return in the same currency and the payment on this account is made in Indian Rupees based on the exchange rate prevailing on the due date of billing.

36. The petitioner has claimed 14% return on equity of Rs.10910.37 lakh for one unit from 1.10.2005 to 1.11.2005 and on equity of Rs.43641.48 lakh from 1.11.2005 to 31.3.2009.

37. In accordance with the provisions of clause (iii) of Regulation 38 of the Tariff Regulations, 2004, return on equity has been calculated as under:

Ser No	Particulars	(Rs in lakh)				
		1.10.2005 to 1.11.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
1	Opening equity	10910.37	43641.48	45818.81	46779.88	46779.88
2	Additional capitalisation	0	2177.33	960.77	0	0
3	Closing Equity	10910.37	45818.81	46779.88	46779.88	46779.88
4	Average Equity (1+3)/2	10910.37	44730.15	46299.19	46779.88	46779.88
5	Return on Equity@14%	129.73	2590.67	6481.89	6549.14	6549.14

Interest on Loan

38. Clause (i) of regulation 38 of the Tariff regulations, 2004 inter *alia* provides that:

(a) Interest on loan capital shall be computed loan-wise on the loans arrived at in the manner indicated in regulation 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 for the period up to 31.3.2004. The repayment for the period 2004-09 shall be worked out accordingly on normative basis.

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

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

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

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

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

(a) Gross actual loan opening for the first unit has been considered on pro rata basis as on the date of commercial operation of the unit on 1.10.2005. Since the DOCO of the generating station was 1.11.2005, gross actual loan has been considered as the normative loan.

(b) Normative repayment of loan during the year is calculated using the following formula:

$$\frac{\text{Actual repayment of loan} \times \text{Normative net loan at the beginning of the year}}{\text{Actual net loan at the beginning of the year}}$$

(c) On the basis of weighted average rate of interest on actual average loan, the weighted average rate of interest on loan has been worked out for different years of the tariff period 2004-09.

(d) The weighted average rate of interest on loan for respective years calculated as per above formula has been applied to average notional loan during the year to work out interest on loan.

40. The petitioner has submitted loan details up to 31.3.2004 for the tariff period. Accordingly loan allocation statement as on 1.4.2004 has been prepared on the basis of:

(a) Gross loan up to 31.3.2004, repayment up to 31.3.2004 and outstanding loan as on 31.3.2004 as worked out from the loan allocation statement for the year 2003-04

(b) Instalments of various loans for the year 2004-09 as furnished by the petitioner.

(c) Allocation of the above instalments on the basis of outstanding loan as on 31.3.2004.

41. Accordingly, the interest on loan has been calculated out as per details given below:

(a) Details of net outstanding loan as on 1.10.2005, repayment schedule for the period 1.10.2005 to 31.3.2009, rate of interest and exchange rate as on DOCO have been taken from loan allocation statement and subsequent submissions of the petitioner for working out weighted average rate of interest.

(b) Gross notional loan as on DOCO has been considered as balancing figure and cumulative repayment up to the date of commercial operation has been taken as 'nil'.

(c) Tariff has been worked out considering normative loan and normative repayments. Once the normative loan is arrived at, it is considered for all purposes in the tariff. Normative repayment is worked out by the following formula:

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

(f) Moratorium in repayment of loan is 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, then depreciation including AAD during the year is deemed as normative repayment of loan during the year.

(g) Weighted average rate of interest on actual loan as worked out as per (a) above has been applied on the notional average loan during the year to arrive at the interest on loan.

(h) The loan from Canara Bank carries a floating rate of interest. The rate of interest as applicable on the date of commercial operation has

been considered in the calculation subject to mutual settlement between the parties in case of any change/resetting in the interest rate during the tariff period.

42. The necessary calculations in support of weighted average rate of interest on loan are as under:

(Rs in lakh)						
Details of loan	1.4.2005 to 30.9.2005	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Days	183	31	151	365	365	365
Canara Bank						
Net loan opening	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00
Repayment during the year	0	0	0	0	0	0
Net loan closing	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00
Average loan	2500.00	2500.00	2500.00	2500.00	2500.00	2500.00
Rate of Interest	8.50%	8.50%	8.50%	8.50%	8.50%	8.50%
Interest	106.54	18.05	87.91	212.50	212.50	212.50
Repayment schedule	4 Annual installments from 28.6.2009					
JBIC Tranche-I						
Net loan opening	20410.36	19485.55	19530.30	19053.78	18101.10	17148.41
Drawal	0	0	0	0	0	0
Repayment during the year	0	0	476.52	952.69	952.69	952.69
FERV	-924.81	44.75				
Net loan closing	19485.55	19530.30	15053.78	18101.10	17148.41	16195.72
Average loan	19947.96	19507.93	19292.04	18577.44	17624.75	16672.06
Rate of Interest	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Interest	350.05	57.99	279.34	650.21	616.87	583.52
	40 Half Yearly instalments from 20.1.2006					
JBIC Tranche-II						
Net loan opening	66960.09	63923.80	64070.60	64070.60	64070.60	62507.63
Drawal	-2.34	0	0	0	0	0
Repayment during the year	0	0	0	0	1562.97	3125.35
FERV	-3033.95	146.80				
Net loan closing	63923.80	64070.60	64070.60	64070.60	62507.63	59382.27
Average loan	65441.94	63997.20	64070.60	64070.60	63289.11	60944.95
Rate of Interest	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Interest	1148.37	190.24	927.71	2242.47	2215.12	2133.07
	40 Half Yearly instalments from 20.12.2007					
JBIC Tranche-III						
Net loan opening	290005.52	32078.45	33437.66	33437.66	33437.66	33437.66
Drawal	4448.31	1270.83				
Repayment during the year	0	0	0	0	0	0
FERV	-1375.38	88.38	0	0	0	0
Net loan closing	32078.45	33437.66	33437.66	33437.66	33437.66	33437.66
Average loan	30541.99	32758.06	33437.66	33437.66	33437.66	33437.66
Rate of Interest	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Interest	382.82	69.55	345.83	835.94	835.94	835.94
	40 Half Yearly instalments from 20.3.2014					
Total Foreign Loan						

Net loan opening	116375.97	115487.80	117038.56	116562.05	115609.36	113093.69
Drawal	4445.97	1270.83	0	0	0	0
Repayment during the year	0	0	476.52	952.69	2515.66	4078.04
FERV	-5334.13	279.93	0	0	0	0
Net loan closing	115487.80	117038.56	116562.05	115609.36	113093.69	109015.65
Average loan	115931.89	116263.18	116800.30	116085.70	114351.52	111054.67
Rate of Interest	1.62%	0.27%	1.33%	3.21%	3.21%	3.20%
Interest	1881.24	317.78	1552.87	3728.62	3667.93	3552.54
Total Loans						
Net loan opening	118875.97	117987.80	119538.56	119062.05	118109.36	115593.69
Drawal	4445.97	1270.83	0	0	0	0
Repayment during the year	0	0	476.52	952.69	2515.66	4078.04
FERV	-5334.13	279.93	0	0	0	0
Net loan closing	117987.80	119538.56	119062.05	118109.36	115593.69	111515.65
Average loan	118431.89	118763.18	119300.30	118585.70	116851.52	113554.67
Rate of Interest	1.678%	0.283%	1.375%	3.323%	3.321%	3.316%
Interest	1987.78	335.83	1640.78	3941.12	3880.43	3765.04
Annualised weighted average rate of interest	3.3477%	3.3294%	3.3245%	3.3234%	3.3208%	3.3156%

43. The interest on notional loan by applying weighted average rate of interest has been computed as under:

COMPUTATION OF INTEREST ON LOAN

(Rs in lakh)

	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Gross opening loan	29496.95	119498.18	124578.62	126820.40	126820.40
Cumulative repayments up to previous year	0	0	1581.64	5524.72	9504.50
Net opening loan	29496.95	119498.18	122996.98	121295.69	117315.91
Addition due to capitalisation	0	5080.44	2241.79	0	0
Repayments during the year	0	1581.64	3943.07	3979.78	4138.80
Net loan closing	29496.95	122996.98	121295.69	117315.91	113177.11
Average loan	29496.95	121247.58	122146.33	119305.80	115246.51
Weighted average Rate of Interest on loan	3.3294%	3.3245%	3.3234%	3.3208%	3.3156%
Interest on loan	83.41	1667.57	4059.46	3961.93	3821.13

Depreciation

44. Sub-clause (a) of clause (ii) of Regulation 38 of the Tariff regulations, 2004 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.

45. The petitioner has claimed depreciation at the weighted average rate of depreciation on the capital expenditure claimed by it in accordance with the above quoted provisions. It is, however, observed that the admitted capital cost as on DOCO and thereafter differs from the capital cost considered by the petitioner for working out the weighted average rate of depreciation. Also, the head-wise details of the undischarged liabilities are not available in order to

arrive at the weighted average rate of depreciation. Hence, the depreciation rate arrived at on the capital cost considered by the petitioner as on the date of commercial operation has been taken for determining the weighted average rate of depreciation. Moreover, the petitioner has not provided the lease agreement of the leasehold land though the lease period has been mentioned as 30 years in the petition. Depreciation rate of 3.33% has been considered for leasehold land assuming full depreciation for this asset. In so far as minor assets are concerned, rate of depreciation has been considered as 2.57% keeping in line with the decisions in case of other stations of the petitioner.

46. Accordingly, depreciation of the generating station has been worked out as under:

		(Rs in lakh)				
		1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Rate of depreciation		2.2921%	2.2925%			
Depreciable value	90%	36140.90	149188.92	153896.06	155337.21	155337.21
Balance useful life of the asset		-	-	-	-	-
Remaining depreciable value		36140.90	36062.24	34480.59	30537.52	36557.74
Depreciation		78.66	1581.64	3943.07	3979.78	3979.78

Advance Against Depreciation

47. Sub-clause (b) of clause (ii) of Regulation 38 of the Tariff regulations, 2004 provides as under:

“(b) Advance Against Depreciation

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”.

48. The petitioner has claimed the Against Depreciation as Nil. Advance Against Depreciation has been worked as under:

(Rs in lakh)

	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
1/10th of Gross loan	2949.70	11949.82	12457.86	12682.04	12682.04
Repayment of loan	0	1581.64	3943.07	3979.78	4138.80
Minimum of above	0	1581.64	3943.07	3979.78	4138.80
Depreciation during the year	78.66	1581.64	3943.07	3979.78	3979.78
Difference(A)	-78.66	0	0	0	159.02
Cumulative repayment of loan	0	1581.64	5524.72	9504.50	13643.30
Cumulative Depreciation/AAD	78.66	1660.30	5603.38	9583.16	13562.94
Difference(B)	-78.66	-78.66	-78.66	-78.66	80.36
Advance Against Depreciation Minimum of (A) and (B)	0	0	0	0	80.36

O&M Expenses

49. Clause (iv)(c) of regulation 38 of the Tariff Regulations, 2004 pertaining to O & M expenses of hydro stations states as under:

“ In case of hydro electric generating stations declared under commercial operation on or after 1.4.2004, the base operation and maintenance expenses shall be fixed at 1.5% of the actual capital cost as admitted by the Commission, in the year of commissioning and shall be subject to an annual escalation of 4% per annum for the subsequent years.”

50. The petitioner has claimed the following O&M expenses for the period 2004-09:

(Rs in lakh)					
Period	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
O&M Expenses	55.48	1084.33	2725.91	2834.95	2948.35

51. We observe that the petitioner has claimed the O&M expenses @ 1.5% of the admitted capital cost as on the date of commercial operation as per the Tariff Regulations 2004. However for the year 2006-07, the O&M expenses have been escalated @ 4% for the full year instead of considering pro rata escalation after completion of one year of DOCO. After considering pro rata escalation during 2006-07, the O&M expenses allowed for calculation of tariff for the tariff period are as under:

(Rs in lakh)					
Period	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
O&M Expenses	51.48	1012.36	2487.59	2587.09	2690.58

Interest on Working Capital

52. In accordance with clause (v) of Regulation 38 of the Tariff regulations 2004, working capital in case of hydro generating stations shall cover:

- (i) Operation and Maintenance expenses for one month;
- (ii) Maintenance spares @ 1% of the historical cost escalated @ 6% per annum from the date of commercial operation; and
- (iii) Receivables equivalent to two months of fixed charges for sale of electricity, calculated on normative capacity index.

53. The Tariff regulations, 2004 further provides that 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.

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

(a) **Maintenance Spares:** The petitioner has claimed maintenance spares for calculation of Interest on Working Capital as under:

(Rs in lakh)					
Period	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Maintenance spares	435.48	1747.38	1852.22	1963.35	2081.15

As per the methodology specified in the Tariff Regulations, 2004, the petitioner has claimed the maintenance spares @ 1% of admitted capital cost on date of commercial operation. However, for the year 2006-07, maintenance spares have been escalated by the petitioner @6% for the full year instead of considering pro rata escalation after one year of DOCO. Considering the pro rata escalation during 2006-07, the cost of maintenance spares allowed for the tariff period 2004-09 is as under:

(Rs in lakh)					
Period	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Maintenance spares	34.32	674.91	1671.89	1772.20	1878.54

(b) **O&M Expenses:** O&M expenses for working capital have been worked out for 1 month of O&M expenses approved above and are considered in working capital of the respective year in accordance with Regulation 38(v)(a)(i) of the Tariff Regulations 2004.

(c) **Receivables:** The receivables have been worked out on the basis of two months of the annual fixed charges.

55. The average SBI PLR of 10.25% as on 1.11.2005 has been considered as the rate of interest on working capital during the tariff period in accordance with the provisions of Regulation 38(v)(b) of the Tariff Regulations 2004.

56. The necessary details in support of calculation of interest on working capital are given below:

(Rs in lakh)

	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Maintenance spares	404.07	1631.40	1671.89	1772.20	1878.54
O&M expenses	50.51	203.92	207.30	215.59	224.21
Receivables	693.24	2840.44	2910.49	2930.34	2939.64
Total	1147.82	4675.76	4789.68	4918.14	5042.39
Interest @ 10.25%	9.99	198.27	490.94	504.11	516.85

ANNUAL FIXED CHARGES

57. The annual fixed charges from the date of commercial operation to 31.3.2009 allowed in this order are summed up in the table below:

Annual Fixed Charges

Rs in lakh)					
	1.10.2005 to 31.10.2005	1.11.2005 to 31.3.2006	2006-07	2007-08	2008-09
Depreciation	78.66	1581.64	3943.07	3979.78	3979.78
Interest on Loan	83.41	1667.57	4059.46	3961.93	3821.13
Return on Equity	129.73	2590.67	6481.89	6549.14	6549.14
Advance Against Depreciation	0	0	0	0	80.36
Interest on Working Capital	9.99	198.27	490.94	504.11	516.85
O&M Expenses	51.48	1012.36	2487.59	2587.09	2690.58
Total	353.27	7050.51	17462.95	17582.05	17637.83

Primary Energy Rate

58. Regulation 39 of Tariff Regulations 2004 provides the following formula for calculation of primary energy charge:

“(1) Primary energy charge shall be worked out on the basis of paise per kWh rate on ex-bus energy scheduled to be sent out from the hydro electric power generating station after adjusting for free power delivered to the home state.

“(2) Rate of primary energy for all hydro electric power generating stations, except for pumped storage generating stations, shall be equal to average of the lowest variable charges of the central sector thermal power generating station of the concerned region for all months of the previous year. The primary energy charge shall be computed based on the primary energy rate and saleable scheduled primary energy of the station.”

59. Based on the average of the lowest variable charges of the thermal power stations of NTPC in the Northern Region, the primary energy rate for calculation of primary energy charges for the year 2005-06 shall be taken as 73.79 paise/kWh. The petitioner shall determine the primary energy charges for the subsequent years of the tariff period in accordance with the provisions of the regulations in consultation with the beneficiary states. No petition for this purpose is required to be filed. However, parties are at liberty to approach the

Commission by way of appropriate petition in case of disagreement to find out an agreed primary energy rate.

60. The rate of secondary energy shall be the same as the rate of primary energy.

Design Energy

61. The petitioner has submitted the month wise details of design energy in respect of the generating station as indicated in the following table:

Month	Design Energy (MU)
April	56.08
August	208.32
September	160.00
October	94.40
November	52.48
December	31.69
January	31.62
February	25.89
March	30.30
Total	1134.69

62. Monthly secondary energy, primary and secondary energy charges shall be computed on the basis of the month wise design energy indicated in the table above.

63. In addition to the charges approved above, the petitioner is entitled to recover other charges also like claim for reimbursement of income tax, other taxes, cess levied by statutory authority and other charges in accordance with the Tariff Regulations, 2004.

64. The petitioner is already billing the respondents on provisional basis in accordance with the orders dated 25.10.2005 and 23.3.2007 in Petition No. 20/2005. The provisional billing of tariff shall be adjusted in the light of the final tariff now approved by us.

65. This order disposes of Petition No. 107/2006.

**Sd/-
(R.KISHNAMOORTHY)
MEMBER**

**Sd/-
(BHANU BHUSHAN)
MEMBER**

New Delhi dated the 13th December, 2007.