

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 250/2010

Coram

Dr. Pramod Deo, Chairperson

Shri S.Jayaraman, Member

Shri V.S.Verma, Member

Shri M.Deena Dayalan, Member

Date of Hearing: 15.3.2012

Date of Order: 16.4.2013

In the matter of

Approval of generation tariff in respect of Tehri Hydroelectric Project Stage-I (1000 MW) for the period 22.9.2006 to 31.3.2009.

And in the matter of

THDC India Ltd.

..... **Petitioner**

Vs

1. Punjab State Power Corporation Ltd, Patiala
2. Haryana Power Generation Corporation Ltd, Panchkula
3. Uttar Pradesh Power Corporation Ltd, Lucknow
4. Delhi Transco Ltd, New Delhi
5. BSES Rajdhani Power Ltd, New Delhi
6. BSES Yamuna Power Ltd, New Delhi
7. North Delhi Power Ltd, Delhi
8. Engineering Department, Chandigarh Administration, Chandigarh
9. Uttarakhand Power Corporation Ltd, Dehradun
10. Himachal Pradesh State Electricity Board, Shimla
11. Rajasthan Rajya Vidyut Prasaran Nigam Ltd, Jaipur
12. Jaipur Vidyut Vitaran Ltd, Jaipur
13. Ajmer Vidyut Vitaran Ltd, Ajmer
14. Jodhpur Vidyut Vitaran Ltd, Jodhpur
15. Power Development Department, Government of J& K, Jammu ... **Respondents**

Parties Present

1. Shri M.G.Ramachandran, Advocate, THDC
2. Ms. Swapna Seshadri, Advocate, THDC
3. Shri R.B.Sharma, Advocate, BRPL
4. Shri Padamjit Singh, PSPCL
5. Shri T.P.S.Bawa, PSPCL

ORDER

This petition has been filed by the petitioner, THDC Ltd for approval of generation tariff in respect of Tehri Hydroelectric Project Stage-I (1000 MW) (hereinafter referred to as “the generating station”) for the period from 22.9.2006 to 31.3.2009, based on the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004 (“the 2004 Tariff Regulations”).

2. The generating station, located in the State of Uttarakhand is a storage type hydro power generating station, providing peaking power and is designed to produce annual energy generation of 2797 MUs. The Tehri Hydro Power Complex comprises of the generating station (1000 MW), Tehri Pumped Storage Plant (1000 MW) and downstream power station at Koteshwar (400 MW). The entire Tehri Power Complex is scheduled to have an aggregate capacity of 2400 MW. The generating station comprises of four units with a capacity of 250 MW each. The dates of commercial operation of these units of the generating station are as under:

	Date of commercial operation
Unit-I	22.9.2006
Unit-II	9.11.2006
Unit-II	30.3.2007
Unit-IV	9.7.2007

3. As an interim measure, the Commission vide its order dated 28.12.2006 in Petition No.63/2006 had approved the provisional tariff for the generating station till 31.3.2007, as follows:

Period	Tariff Rate
22.9.2006 to 31.12.2006	₹3.50/kWh on single part basis
1.1.2007 to 31.3.2007	(i) Energy Charge: @ ₹2.50/kWh on scheduled energy. (ii) Capacity Charge: ₹18000/MW/Day

4. The above said provisional tariff of the generating station was allowed to be continued from 1.4.2007 to 30.6.2007 by Commission's order dated 23.3.2007 and was further extended up to 31.12.2007 and 31.3.2008, by orders dated 13.7.2007 and 19.12.2007 respectively. Thereafter, by order dated 28.3.2008, the Commission directed that the provisional tariff for the generating station approved vide order dated 28.12.2006 shall be continued till further orders, subject to adjustment after determination of final tariff.

5. The annual fixed charges claimed by the petitioner for the period from 22.9.2006 to 31.3.2009 are as under:

	(₹ in lakh)		
	2006-07	2007-08	2008-09
Depreciation	6626.09	14616.38	15294.09
Interest on Loan	15343.97	36373.43	37102.65
Return on Equity	16331.79	35290.67	35781.90
Advance Against Depreciation	783.38	11560.03	15987.48
Interest on Working Capital	1100.00	3169.57	3352.16
O&M Expenses	4400.89	9796.79	10157.15
Total Annual Fixed Charges (annualised)	44856.12	110806.87	117675.43

6. The respondent No.1 (PSPCL), respondent No.3 (UPPCL) and respondent No. 5, BRPL have filed their replies and the petitioner has filed its rejoinder to the said replies.

Capital Cost

7. The detailed break-up of the capital cost as approved by the Central Government is summarized as under:

Cost of the Project	(₹ in crore)				Total Cost
	Irrigation component	Power Component			
		IDC	Hard Cost	Sub-total (Power Component)	
Original approval	563.00	427.74	2252.00	2679.74	3242.74
RCE-I	1180.96	560.00	4774.83	5334.83	6515.79

RCE-II	1441.34	1185.76	5765.35	6951.11	8392.45
Actual cost upto COD	1387.12	1186.05	5324.13	6510.18	7897.30

8. The final completion cost of the project of ₹8392.54 crore includes power component of ₹6951.11 crore and Irrigation component of ₹1441.34 crore. The completion cost of Tehri Dam and the generating station as approved by CEA vide its letter dated 23.5.2008 is as given under..

(₹ in lakh)

	Total
Civil Works	601898
E & M Works	118771
Total Hard Cost	720669
IDC & FC	118576
Total Cost	839245

9. The RCE-II of the generating station for the said above cost was approved by the Central Government vide its letter dated 11.11.2010 and it was observed that the generating station has been under commercial operation since the year 2006-07.

10. The capital cost incurred as on COD of the units as submitted by the petitioner is as under:

(₹ in lakh)

	Project Cost	Unit-IV	Unit-III	Unit-II	Unit-I
		22.9.2006	9.11.2006	30.3.2007	9.7.2007
1	Hard Cost				
a	Infrastructure Works	25023	25023	25023	25023
b	Major Civil Works including Hydro Mechanical Equipment	321459	321459	321459	321453
c	Plant & Equipment	30938	52472	74001	91145
d	Taxes and Duties	4071	8140	12211	16284
e	Construction & Pre-commissioning expenses	1920	3840	5758	7681
f	Overheads	198928	205111	211294	218144
2	Interest during construction (IDC) etc	97563	105131	112699	118605
3	Less: Net-off of the balance (unadjusted advances and liabilities)	(-) 8604	(-) 8604	(-) 8604	(-) 8604
4	Total Cost (1+2+3)	671298	712572	753841	789731

5	Irrigation Component (5)	138712	138712	138712	138712
6	Total Cost (Power Component (4-5))	532586	573860	615129	651019

11. We shall now examine the time and cost overrun involved in the completion of the project as under:

Time and cost overrun

12. The petitioner has submitted that the project has been the subject of controversies since long. After the Uttarkashi earthquake during October, 1991, agitation by anti-dam activists against the project intensified and during 1992, Shri Sundarlal Bahuguna went on a fast seeking review of the project on various issues. On the directions of the then Prime Minister, after the two review meetings held on 6.5.1992 and 20.5.1992, the Cabinet Secretary convened the meeting of Secretaries on 28.7.1992, in which experts from both the sides were present. It was finally concluded in the said meeting that the project appeared to be safe from seismic angle.

13. The original investment approval of the project was accorded by the Central Government on 15.3.1994 with the scheduled commissioning of two units during 1997-98 and for completion of the project during 1998-99.

14. In response to the letter of the Commission dated 8.4.2011, the petitioner has submitted vide its affidavit dated 29.4.2011 that subsequent to the investment approval, the progress of the project beginning from March, 1994 was hampered due to various reasons including the agitation against the project, the second phase of fast by Shri Sundarlal Bahuguna, the agitation for employment and enhanced compensation package by population from the nearby villages, continuation of Uttrakhand agitation affecting the pace of work, Government ban on shifting of the population of Old Tehri

town, ban on blasting and movement of vehicles, various Rehabilitation & Environmental aspects, non vacation of Old Tehri town, non-closure of Diversion Tunnels, etc.

15. Considering the delay and cost overrun of the project, RCE-I was approved by Govt. of India vide its letter no. 3/4/2002-H-I dated 19.11.2004, in which the three units of 250 MW each of the project were scheduled to be completed by June, 2005 and the last Unit in July, 2005.

16. The actual COD of the generating station is 9.7.2007 which implies a time overrun of 23 months. The Standing Committee constituted by the Ministry of Power, Govt. of India for fixing the responsibility for time and cost overrun has in its report has observed that all the four units were commissioned by March, 2007 and there is a time overrun of 20 months as compared to the commissioning schedule as per RCE-I.

17. The reasons for the delay of 20 months in the commissioning of the project as submitted by the petitioner to the Standing Committee are briefly, as under:

(a) There are four diversion tunnels, two diversion tunnels T-1 and T-2 on the left bank and two diversion tunnels T-3 and T-4 on right bank, which were required to be closed for impoundment of the reservoir. Diversion Tunnels T-3 and T-4 were closed in December, 2001. The Inter-Ministerial Review Committee (IMRC) set up for periodic review of Environment and R&R issues concluded that the project authority may go ahead as per schedule to start impoundment of the reservoir by end of December, 2003. Diversion Tunnel T-1 was closed in January, 2004 and closure of last diversion Tunnel T-2 was planned in September, 2004.

(b) Due to poor rock strata, there was a Rock fall in Shaft T-3 on 2.8.2004. Thus, the completion of T-3 Circuit got delayed.

(b) In the second meeting of IMRC on 30.8.2004, it was concluded that Intermediate Level Outlet (ILO) gates at EL 700.0m can be closed so that impoundment could take place upto EL 740 m after the closure of diversion tunnel T-2. But due to another rock fall in shaft T-3 at the junction of shaft and swirling device in December, 2004, T-2 could not be closed. As per revised construction

programme submitted to the Ministry of Power, Govt. of India, closure of Diversion Tunnel T-2 was planned in end September, 2005/early October, 2005 considering the latest situation.

(c) Meanwhile, the High Court of Uttarakhand on 31.8.2005 ordered stay on closure of Diversion Tunnel T-2. After completion of R&R works associated with the reservoir impoundment, Tunnel T-2 was allowed to be closed on 29.10.2005 and impoundment of reservoir commenced.

(d) Although two units of the generating station were successfully rolled on 31.3.2006, yet commissioning process could not be started as requisite water level i.e Minimum Draw Down Level (MDDL) of EL 740.0M in the reservoir was not achieved due to delayed closure of Diversion Tunnel T-2. However, MDDL (740.0 m) was achieved on 15.5.2006 and thereafter commissioning activities of the units could be started. This resulted in shifting of the Commissioning schedule.

(e) Erection of generating units has been executed by M/s BHEL and as per contract there was a gap of 5 to 6 months between successive commissioning of the units. As per approval of RCE-I, three units of 250 MW each were scheduled to be completed at a time in June, 2005 and last unit in July, 2005 i.e after one month. In actual average gap between commissioning of successive units has been around three months.

18. As regards Cost over-run, the submissions made by the petitioner before the Standing Committee is as under:

(a) The completion cost estimate of the Tehri dam and the generating station as concurred by CEA is ₹8392.45 crore including IDC & FC as against the RCE-I (March 2003 PL) of ₹6515.79 crore. There is an increase of ₹1876.66 crore which is 28.80% over RCE-I and the factors attributed to the said increase are as under:

Reasons	Increase from RCE-I (Rs in Cr)	% increase in Cost	
		Of total Increase of (Rs 1876.66 Cr)	Of sanctioned RCE-I (Rs 6515.79 Cr)
Escalations & FE Variation	413.97*	22.06	6.35
Inadequate Provisions	276.08	14.72	4.24
Addition/deletion	204.30	10.88	3.14
Change in design/scope	81.37	4.33	1.25
Others	117.57	6.26	1.80
Awarded claims	21.26	1.14	0.33
Establishment Audit & Account charges	136.35	7.27	2.09
IDC & FC	625.76	33.34	9.60
TOTAL	1876.66	100.00	28.80

*includes FE variation of 14.10 lakh

19. After examining the submissions of the petitioner on the Time and Cost overrun involved in the project, the Standing Committee had concluded in its report as under:

"10.0 Conclusions/Suggestions of the Committee-

10.1. The completion cost estimate of Tehri dam and HPP (1000 MW) worked out to ₹8392.45 crore. including IDC and FC as against the approved revised cost estimate-I (March'03 PL) of ₹6515.79 cr. Thus there is an increase of ₹1876.66 crore, which is 28.08% over RCE-I.

10.2. The increase in cost of ₹739.78 cr. (11.4%) is due to increase in escalation, IDC & FC, establishment charges and consequential expenditure due to time overrun of 20 months. Besides there was a deficit of ₹510.16 crore over RCE-I.

As outlined in para 4.4.1 one of the main reasons for the cost increase of ₹626.72 crore is the increase in R&R works to the tune of ₹239.32 cr. (without escalation). This increase in R&R works is mainly due to additional measures required for the partially affected and cutoff area people and for creating the facilities for providing connectivity to the cut-off areas. The remaining increase of ₹387.40 crore (about 6% over RCE-I) is on account of changes in design & scope, inadequate provisions and addition/ deletion which were necessary for the completion of the project works. These have been enumerated at para 4.4.2 and 4.5.

10.3 As brought out in para 7, the time overrun of 20 months is mainly on account of delay in closure of diversion tunnel T-2 due to delay in completion of T-3 circuit because of the rock fall in the vertical shaft of T3 Tunnel and on account of the stay granted by Hon'ble High Court of Uttarakhand on the PIL's filed against closure of the T2 Tunnel to start filling up the reservoir.

10.4 The Committee is of the opinion that the time overrun and the cost overrun were beyond the control of THDC and no individual can be held responsible for the same. The Committee however recommends the following for future....."

20. The respondent, PSPCL in its reply dated 21.3.2012 has summarized its objections on the Time and Cost overrun as under:

- (a) In case Unit Nos. 4, 3 had been tested and commissioned by 30.4.2006, these units could have been put on infirm generation from 1.5.2006 even with level of 730 meters since there is no prohibition, bar or restriction on generating power below the MDDL of 740 meters.
- (b) When water was actually being released through the dam from 1.5.2006 onwards, this water could have been passed through the turbines for generating infirm power.

- (c) On 16.5.2006 when 740 meters level was reached, the COD could have been declared for Unit Nos. 4, 3.
- (d) With Unit No. 2 boxed up on 30.6.2005, this unit could also have been rolled on 31.3.2006 along with Unit Nos. 4,3 and Unit No. 2 could have been put on COD latest by 1.6.2006 as under-

Unit	Rolling	Required COD
4	31.3.2006	16.5.2006
3	31.3.2006	16.5.2006
2	*	1.6.2006
1	**	15.9.2006

*Unit 2 not rolled on 31.03.2006 even though it was boxed up on 30.6.2005

** Unit 1 which was boxed up on 31.8.2006 could have been put on COD by 15.9.2006 since by that date units 4, 3, 2, should have been put on COD.

- (e) The data of releases (and spillage loss) made from the dam (Spillage loss) for the period up to October, 2006 has been worked out. The energy equivalent of water released from the dam (May, 2006 to October,2006) is 1339.62 MU and the energy equivalent of spillage loss is 1327.77 MU.
- (f) In case the total inflows into dam had been fully impounded and stored, the delay in commissioning of the units would not have resulted in spillage/energy loss. However, the fact that water was actually being released from the dam on daily basis was the major ground and justification for the petitioner to have commissioned the Unit Nos. IV and III particularly by May, 2006, Unit No. II by June, 2006 and Unit No.1 by September, 2006.
- (g) Due to delay on COD of units, the beneficiaries have been put to multiple loss.
- (h) For 2006-07 against ex-bus MU of 759 MU, the generation loss resulting from the delayed commissioning of the units is over 1300 MU. Had this energy been available either as infirm generation or as firm generation, the overall tariff for 2006-07 would have reduced.
- (i) The delay in commissioning of units was not due to uncontrollable or unforeseen factors, but due to organizational issues relating to contracts, testing and commissioning procedures and arranging personnel for which the respondent/beneficiary must not be penalized.
- (j) The dates of commissioning, COD and date of boxing up of the units mentioned in Page G-14 of the Standing Committee report show that Unit Nos. 4 and 3 in particular, were ready / boxed up years in advance and were awaiting the availability of water/dam filling. The historical fact is that whereas the dam was

delayed due to factors such as rock fall in T-III, agitation, stay order of High Court etc., there was no such bar or restriction of the construction of the units, which constructed and completed very much in advance of the dam filling. Thus, Unit No. 4 being boxed up on 31.3.2003 was ready over 3 years in advance, while Unit No. 3 which was boxed up on 24.8.2004 was ready 1^{1/2} years in advance of water availability, i.e. March, 2006.

- (k) After completing the rolling of units on 31.3.2006, the petitioner was in a position to have gone ahead with completing the testing and commissioning process which involves running the turbine on no load which was very much possible with the prevailing water level. This testing and commissioning process could very well have been completed within one month and the unit could have been put on infirm generation by the end of April, 2006 and on COD from 15.5.2006 when the MDDL of 740 meters was achieved.
- (l) The testing/commissioning of Unit Nos. 4, 3 and 2 was an activity which could have been carried out simultaneously in parallel. However, due to non-availability of testing/commissioning experts, this activity was carried out in series taking one unit at a time. When two units (Unit Nos. IV and III) were actually rolled on 31.3.2006, the balance testing should also have been continued and carried out simultaneously which was not done. Unit No. 2 could also have been rolled on 31.3.2006 but this was not done.
- (m) During the filling process of the dam starting from 29.10.2005 onwards, the total inflows were not impounded but some releases had to be made from the dam to meet the irrigation requirement etc.
- (n) From 1.5.2006, the Unit Nos. 4 and 3 could have been put on infirm generation, so that the water that was otherwise being released directly from the dam could be utilized through the turbines of these two units for infirm generation. On 1.5.2006, the level was 730.5 meters which increased to 740 meters on 16.5.2006. Thus, for the period from 1.5.2006 to 15.5.2006, the units could have generated power in infirm mode and from 16.5.2006 when MDDL of 740 meter was achieved, the Unit Nos. 4 and 3 could have been declared COD.
- (o) After the closure of T-II tunnel on 29.10.2005, the petitioner was having a very good estimate of reservoir filling. With Unit No. 4 already boxed up since 31.3.2003 and Unit No. 3 already boxed up since 24.8.2004 and Unit No. 2 already boxed up since 30.6.2005, the petitioner should have made atleast 3 teams ready for testing and commissioning of the Unit Nos. 4, 3 and 2, so that this activity could start as soon as the reservoir level crosses 720 meters (actual date 27.3.2006). Thus, from 29.10.2005 to 27.3.2006, the petitioner had 5 months at its disposal to arrange for the testing and commissioning teams to be ready for the testing work as soon as the water became available.
- (p) In case of higher infirm power generation resulting from timely commissioning of the units, the cost of the project would have reduced considerably.

- (q) While the delay in COD has resulted in increased IDC, it would reflect in higher tariff over the life to the project. Hence, the delay in COD must not be allowed.
- (r) Further, PSPCL has objected to the capitalization of full expenditure on dam and other civil works w.e.f the COD of first unit.

21. The respondent, BRPL has also submitted that all the major works were capitalized on 22.9.2006 (along with COD of Unit No. IV), the generation was very low and there was spillage / bye-pass loss of energy due to delay in commissioning of the unit. It has further submitted that the beneficiaries have suffered multiple losses due to:

- (i) Spillage of water due to non-commissioning of units.
- (ii) High tariff resulted from fixed charges being apportioned on lesser quantum of generation.
- (iii) Denial of infirm energy possible to be generated before COD.

22. As regards the time and cost overrun involved in the generating station for the period between the originally approved completion schedule (1998-99) and the completion schedule envisaged as per RCE-I (July, 2005), we have examined the submissions of the petitioner as stated in para 14 above. Considering the difficulties faced by the petitioner as stated, we are of the considered view that the delay and the consequent time overrun for the period between 1998-99 to July,2005 cannot be attributable to the petitioner as the same was beyond its control. As regards the delay of 23 months between the period from the completion schedule envisaged as per RCE-I (July, 2005) and the actual COD of the generating station (9.7.2007), we have considered the findings/recommendations of the Standing Committee as quoted in para 19 above and are of the view that the delay of 20 months from July, 2005 to March, 2007 is not attributable to the petitioner. However, while agreeing with the concerns

raised by the respondents as regards the delay in achieving of CODs of the units of the generating station, we are of the view that with extra efforts on the part of the petitioner, specially, in view of the fact that the project had already suffered substantial time overrun, the petitioner could have managed the early declaration of commercial operation of successive units after the COD of Unit No.IV on 22.9.2006. Even if two months' time is considered reasonable for the declaration of COD of the units after the COD of Unit No.IV on 22.9.2006, in our view, the generating station would have achieved commercial operation on 22.3.2007. In the RCE –II approved by the Ministry of Power, Govt. of India on 11.11.2010, it has been stated that the generating station had been commissioned and is under commercial operation since the year 2006-07. Considering the above factors in totality and in view of the fact that the Standing Committee had concluded that the delay of 20 months is not attributable to the petitioner, we allow the Time overrun of the generating station up to 30.3.2007 (i.e for 20 months) against the actual Time overrun of 23 months. Consequent upon this, the IDC claimed by the petitioner shall be restricted to the above said date, which works out to ₹112699 lakh and the same is allowed against the claim of ₹118605 lakh (as on 9.7.2007).

Capital cost

23. It is observed that the capital expenditure claimed by the petitioner as at para 10 above, does not depict the capital expenditure till the CODs of the respective units of the generating station. Beginning from the capital expenditure as on 8.7.2007, the petitioner has claimed the same expenditure as on the CODs of the respective units under the major heads like Infrastructure works, Major civil works including hydro

mechanical equipment and Overheads. The expenditure under these major heads is more than 50 % of the total cost claimed as on the COD of the generating station. As such, the unit wise break-up of the capital cost with reasonable apportionment of common facilities, has not been made available by the petitioner. However, the unit wise break-up for other major expenditure under the head 'Plant and Equipment' has been submitted by the petitioner.

24. Regulation 4(2) of the 2004 Tariff Regulations, provides as under:

"4 (2) For the purpose of tariff, the capital cost of the project shall be broken up into stages and by distinct units forming part of the project. Where the stage-wise, unit-wise, line-wise or sub-station-wise breakup of the capital cost of the project is not available and in case of on-going projects, the common facilities shall be apportioned on the basis of the installed capacity of the units and lines or sub-stations. In relation to multipurpose hydro electric projects, with irrigation, flood control and power components, the capital cost chargeable to the power component of the project only shall be considered for determination of tariff.

25. Based on the above discussions, the Capital cost as on the COD of the respective units of the generating station, after restriction of IDC to ₹112699 lakh and apportionment of expenditure under all heads as on COD of the generating station, equally between all units based on installed capacity of the units, except for expenditure under the head 'Plant and equipment', is as under:

(₹ in lakh)					
S.N.	Project Cost	Unit-IV	Unit-III	Unit-II	Unit-I
		22.9.2006	9.11.2006	30.3.2007	9.7.2007
1	Hard Cost				
a	Infrastructure Works	6256	12511	18767	25023
b	Major Civil Works including Hydro Mechanical Equipment	80363	160726	241090	321453
c	Plant & Equipment	30938	52472	74001	91145
c	Taxes and Duties	4071	8142	12213	16284
e	Construction & Pre-commissioning expenses	1920	3841	5761	7681
f	Overheads	54536	109072	163608	218144
2	Interest during construction (IDC) etc	28175	56350	84524	112699

3	Less: Net-off of balance (unadjusted advances and liabilities)	(-) 2151	(-) 4302	(-) 6453	(-) 8604
4	Total Cost (1+2+3)	204108	398812	593511	783825
5	Irrigation Component (5)	34678	69356	104034	138712
6	Total Cost (Power Component) (4-5)	169430	329456	489477	645113

Additional Capital Expenditure

26. Regulation 34 (1) of the 2004 Tariff Regulations provides as under:

“The following capital expenditure within the original scope of work actually incurred after the date of commercial operation and up to the cut-off date may be admitted by the Commission subject to prudence check.

- (i) Deferred liabilities,
- (ii) Works deferred for execution,
- (iii) Procurement of initial capital spares in the original scope of works subject to ceiling specified in regulation 33,
- (iv) Liabilities to meet award of arbitration or in compliance of the order or decree of a court, and
- (iv) On account of change in law.

Provided that original scope of works along with estimates of expenditure shall be submitted along with the application for provisional tariff.

Provided further that a list of the deferred liabilities and works deferred for execution shall be submitted along with the application for final tariff after the date of commercial operation of generating station.

27. As stated, the COD of the generating station is 9.7.2007. Hence, the cut-off date of the generating station is 31.3.2009 in terms of Regulation 31(viii) of the 2004 Tariff Regulations. We now proceed to consider the claims of the petitioner for capitalization in the subsequent paragraphs.

(a) **Additional Capital Expenditure from 9.7.2007 to 31.3.2008**

28. The following are the expenditure claimed by the petitioner in respect of assets/works within the original scope of work and actually incurred after the COD and upto the cut-off date of the generating station.

(₹ in lakh)

Building	
Residential Building	281.23
Non Residential Building	72.37
Temporary Building	(-) 7.01
Road & Bridges	32.13
Construction Plant and Machinery	(-) 5.02
Generating Plant and Machinery	
Main Generating Plant and Machinery	(-) 1915.89
Hydraulic works	
Dam Barrage & spillways Excluding irrigation component	7617.41
Tunnels, Surge Tanks, penstocks & Other Hydraulic Works excluding PSP essential works	1493.33
Self-propelled vehicles	20.29
Furniture and Fixture	186.70
Water supply, Drainage and Sewerage	1.73
Assets not owned by the company	0.00
Miscellaneous assets / equipment	399.32
Sub-station equipment	33.71
Internal distribution lines	(-) 7.38
Sub-Total (A)	8202.92
Less: Net-off liability /Advances (B)	2657.29
Total (A+B)	5545.62

(b) **Additional Capital Expenditure from 1.4.2008 to 31.3.2009**

29. The following are the expenditure claimed by the petitioner in respect of assets/works within the original scope of work and actually incurred after the COD and upto the cut-off date of the generating station.

(₹ in lakh)

Building	
Residential Building	777.55
Non Residential Building	484.61
Temporary Building	110.90
Road & Bridges	261.55
Construction plant and Machinery	11.83

Generating plant and Machinery	
Main generating plant and Machinery	4132.58
Switchgear including cable connections	170.56
Hydraulic works	
Dam Barrage & spillways excluding irrigation component	9304.49
Tunnels, Surge Tanks, penstocks & Other Hydraulic Works excluding PSP essential works	7086.59
Self-propelled vehicles	(-) 23.72
Furniture and Fixture	125.19
Water supply, Drainage and Sewerage	(-) 18.27
Assets not owned by the company	0.30
Miscellaneous assets / equipment	162.84
Substation equipment	225.89
Internal distribution lines	74.73
Total (A)	22887.62
Less: Net-off liability /Advances (B)	(-) 7296.80
Grand Total (A+B)	30184.42

30. The petitioner has submitted that contract was already awarded during the construction period, but however capitalization could not be made due to non-completion of respective works and the same has been capitalized after COD of the respective units depending upon the year of completion. Based on the justification submitted by the petitioner and after prudence check, the capitalization of the above expenditure in respect of the said assets/works for the period from 9.7.2007 to 31.3.2008 and from 1.4.2008 to 31.3.2009 is allowed under Regulation 34(1)(ii) of the 2004 Tariff Regulations.

31. Based on the above discussions, the capital cost considered for the purpose of tariff for the period 22.9.2006 to 31.3.2009 are as under:

(₹ in lakh)

	2006-07			2007-08		2008-09
	22.9.2006 to 8.11.2006 (Unit I)	9.11.2006 to 29.3.2007 (Unit-II)	30.3.2007 to 31.3.2007 (Unit III)	1.4.2007 to 8.7.2007 (Unit I to III)	9.7.2007 to 31.3.2008 (Unit IV)	1.4.2008 to 31.3.2009
Opening Capital Cost	169430.00	329458.00	489477.00	489477.00	645113.00	650658.62
Additional capitalisation	0.00	0.00	0.00	0.00	5545.62	30184.42
Closing Capital cost	169430.00	329458.00	489477.00	489477.00	650658.62	680843.04

Debt Equity Ratio

32. Regulation 36 of the 2004 Tariff Regulations, provides as under:

“(1) In case of the existing project, debt–equity ratio Considered by the Commission for the period ending 31.3.2004 shall be considered for determination of tariff with effect from 1.4.2004.

Provided that in cases where the tariff for the period ending 31.03.2004 has not been determined by the Commission, debt equity ratio shall be as may be decided by the Commission:

Provided further that in case of the existing generating stations where additional capitalization has been completed on or after 1.4.2004 and admitted by the Commission under regulation 34, equity in the additional capitalization to be considered shall be:-,

- (a) 30% of the additional capital expenditure admitted by the Commission; or
- (b) Equity approved by the competent authority in the financial package, for additional capitalization; or
- (c) Actual equity employed,

Whichever is the least:

Provided further that in case of additional capital expenditure admitted under the second proviso, the Commission may consider equity of more than 30% if the generating company is able to satisfy the Commission that deployment of such equity of more than 30% was in the interest of general public.

(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”.

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

33. The petitioner has claimed the actual debt equity ratio of 62.78:37.22 in terms of the proviso as stated above, based on the following justifications:

- (a) The expenditure of ₹5879.18 crore had already been incurred upto 31.3.2004 and for keeping the Interest during Construction low, equity portion has been deployed first and thereafter expenditures have been made through loan. This has gone to the benefits of the consumers due to capitalization of less IDC.
- (b) ₹2558.63 crore was deployed as equity by Government of India and Government of Uttar Pradesh. The said amount included ₹563.19 crore of loan which was converted retrospectively into equity by Government of India vide its letter dated 19.11.2004. Therefore, the debt component of the funding of the project was taken re-course in the later part of the construction stage i.e. after adjusting the equity capital.
- (c) The petitioner has also taken the following action to reduce the component of Interest During Construction to bring down the capital cost of the project:
 - (i) Initially, short term loans were taken at very low rate of interest @ 6%-6.5% per annum which were rolled over from time to time. These short-term loans were liquidated in the penultimate stage of the project by September, 2006. This has resulted into substantial savings in the project cost by way of reduction in the interest during Construction to the tune of approximately ₹25.56 Cr.
 - (ii) The supplier's credit of ₹400 crore by Russian supplier @ 8.5% in dollar terms plus 1.2% guarantee fee to Government of India was prepaid by raising Indian Rupee loan from Power Finance Corporation (PFC) @ 7.75% per annum.

- (iii) The Government of India loan of ₹408.57 crore carrying rate of interest @ 14% & 13.5% was prepaid by raising cheaper loan @ 8.25% from Rural Electricity Corporation (REC).

34. The respondents HPPC, UPPCL and NDPL have objected to the debt equity ratio claimed by the petitioner and have submitted that the debt equity ratio of 70:30 shall only be considered for the purpose of tariff.

35. The expenditure as per RCE-II considered for determination of capital cost of the project is as under:

Sources of Funding		<i>₹(in crores)</i> RCE-II & Completion Cost
(A)	Irrigation Component (20% of hard cost to be incurred by Government of Uttar Pradesh)	1441.34
(B)	Power Component (80%)	6951.11
a)	Equity	
i)	GOI (75%)	1918.98
ii)	GoUP (25%)	639.65
	Total Equity	2583.83
b)	Loan	
i)	ECB	114.67
ii)	PFC/REC Loan	4043.51
iii)	Loan from Government of India/FIs/Banks	00
	Total Loan	4158.18
c)	Internal Resources (Equity)	234.30
GRAND TOTAL		8392.45

36. The details of the capital deployed since the inception of the project has been submitted by the petitioner and the same is extracted under

(₹ in crore)

Year	Debt		Equity		Total Capital Employed
	Total Debt	Debt (%)	Equity	Equity (%)	
1988-89		0%	213.22	100%	213.22
1989-90		0%	288.22	100%	288.22
1990-91		0%	456.22	100%	456.22
1991-92		0%	539.77	100%	539.77
1992-93		0%	589.77	100%	589.77
1993-94		0%	709.77	100%	709.77
1994-95		0%	842.41	100%	842.41
1995-96		0%	989.58	100%	989.58
1996-97		0%	1166.17	100%	1166.17
1997-98	3.38	0%	1504.67	100%	1508.05
1998-99	207.38	12%	1557.67	88%	1765.05
1999-00	543.92	24%	1710.12	76%	2254.04
2000-01	912.07	34%	1810.12	66%	2722.19
2001-02	1518.70	44%	1928.62	56%	3447.32
2002-03	2398.36	54%	2061.85	46%	4460.21
2003-04	2760.46	57%	2068.29	43%	4828.74
2004-05	2111.21	44%	2655.98	56%	4767.18
2005-06	3212.30	54%	2720.18	46%	5932.47
2006-07	4154.22	61.9%	2558.63	38.12%	6712.85
2007-08	3959.24	60.77%	2555.85	39.23%	6515.09

37. It is noticed that ₹1166.17 crore had been deployed as equity in the project upto 1996-97, which constitutes around 20% of the project cost. Subsequently, equity of ₹1389.68 crore had been deployed from the year 1997-98 till 2007-08. Only from the year 1997-98, debt has been deployed in the project and ₹3959.24 crore was deployed from 1997-98 till 2007-08. Deployment of debt and equity show that till the year 2001-02, more equity was deployed as compared to debt, which had been slowly brought down with the exception for the year 2004-05. Had the project been funded strictly in accordance with the debt equity ratio of 70:30 from the beginning, it would have resulted in accumulation of substantial amount of IDC which would have further inflated the capital cost. Therefore, initial deployment of equity of the project till 1996-97 has resulted in lower IDC which is in the interest of the beneficiaries/consumers. In the above background, we allow the debt equity ratio of 62.78:37.22 as claimed by the

petitioner in deviation of the 70:30 debt equity norm keeping in view the interest of the beneficiaries. This is in line with the methodology adopted by the Commission in respect of some of its orders pertaining to the hydro generating stations of NHPC,

38. As regards the rates for apportionment of the additional capital expenditure between debt and equity, Note 1 and Note 3 under Regulation 34 of the 2004 Tariff Regulations provides as under:-

"Note 1

Any expenditure admitted on account of committed liabilities within the original scope of work and the expenditure deferred on techno-economic grounds but falling within the original scope of work shall be serviced in the normative debt-equity ratio specified in regulation 36.

Note 3

Any expenditure admitted by the Commission for determination of tariff on account of new works not in the original scope of work shall be serviced in the normative debt-equity ratio specified in regulation 36."

39. It may be seen that any expenditure incurred on account of liabilities within the original scope of work and any expenditure incurred on account of new works not in the original scope of work shall be serviced in the normative debt equity ratio as specified in Regulation 36. Since equity more than the 30% has been allowed in respect of original cost, the entire amount of additional capitalisation has been treated as loan, as this would lead to an overall debt equity ratio closer to the debt equity ratio of 70:30 during the period 2004-09 and onwards.

Return on Equity

40. Return on equity has been worked out @14% per annum on the normative average equity, as under.

(₹ in lakh)

	2006-07	2007-08	2008-09
Opening Equity	182183.34	240111.06	240111.06
Add: Additional Capitalisation	0.00	0.00	0.00
Closing Equity	182183.34	240111.06	240111.06
Average Equity	182183.34	240111.06	240111.06
Return on Equity	7932.54	31421.89	33615.55

Interest on Loan

41. Regulation 38(i) of the 2004 Tariff 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 in accordance with Regulation 36 minus cumulative repayment as admitted by the Commission or any other authority having power to do so, up to 31.3.2004. The repayment for the period 2004-09 shall be worked out on a normative basis;

42. Interest on loan has been computed as under:

(i) The opening gross normative loan as on the COD of each unit has been worked out in accordance with Regulation 36 of the 2004 Tariff Regulations.

(ii) In absence of adequate data regarding loan schedule and actual repayment of loan, the normative repayment of loan has been worked out based on the repayment of loan submitted by the petitioner in Form-14. This repayment has been apportioned on the basis of gross opening loan as per Form 14 and gross opening loan worked out for tariff purposes in accordance with Regulation 36. Weighted average rate of interest on loan @ 9%, 9.41% and 9.69% for the years 2006-07, 2007-08 and 2008-09 respectively as submitted by the petitioner has been considered for working out the Interest on loan.

43. Interest on loan is worked out as under:

(₹ in lakh)

	2006-07	2007-08	2008-09
Gross Opening Loan	307293.66	405001.94	410547.56
Cumulative Repayment upto previous year	0.00	5107.54	28418.95
Net Loan-Opening	307293.66	399894.40	382128.61
Repayment during the year	5107.54	23311.41	26779.98
Add: Additional Capitalisation/drawl	0.00	5545.62	30184.42
Net Loan-Closing	302186.12	382128.61	385533.05
Average Loan	304739.89	391011.51	383830.83
Weighted Average Rate of Interest on Loan	9.00%	9.41%	9.69%
Interest on loan	8498.38	33701.09	37192.56

Depreciation

44. Regulation 38(ii)(a) of the 2004 Tariff Regulations provides:

"For the purpose of tariff, depreciation shall be computed 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 life 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 total value of land, both freehold and leasehold has been excluded from the capital cost while computing 90% of the historical cost of the asset. The weighted average rate of depreciation of 2.270%, calculated as above, has been considered for the calculation of depreciation.

	(₹ in lakh)		
	2006-07	2007-08	2008-09
Opening Gross block	489477.00	645113.00	650658.62
Add: Additional Capitalisation	0.00	5545.62	30184.42
Closing Gross block	489477.00	650658.62	680843.04
Average Gross block	489477.00	647885.81	665750.83
Value of Land	986.28	1315.04	1315.04
Rate of Depreciation	2.270%	2.270%	2.270%
Depreciable Value	439641.65	581913.69	597992.21
Remaining Depreciable Value at the beginning	434534.11	548387.57	596224.26
Depreciation	3456.41	13737.24	15115.72

Advance Against Depreciation

46. Regulation 38(ii) (b) of the 2004 Tariff Regulations provides as under:

"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.

47. Accordingly, Advance Against Depreciation has been worked out as under:

	(₹ in lakh)		
	2006-07	2007-08	2008-09
1/10th of Gross Loan(s)	30729.37	40500.19	41054.76
Repayment of the Loan	5107.54	23311.41	26779.98
Minimum of the above	5107.54	23311.41	26779.98
Depreciation during the year	3456.41	13737.24	15115.72
(A) Difference	1651.14	9574.17	11664.26
Cumulative Repayment of the Loan	5107.54	28418.95	55198.93
Cumulative Depreciation	3456.41	18844.78	43534.67
(B) Difference	1651.14	9574.17	11664.26
Advance against Depreciation Minimum of (A) and (B)	1651.14	9574.17	11664.26

Operation & Maintenance Expenses

48. Regulation 38 (4)(c) of the 2004 Tariff Regulations provides as under:

"(c) In case of the 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.

49. The capital cost admitted by the Commission in this order is as follows:

	(₹ in lakh)			
	Unit-I	Unit-II	Unit-III	Unit-IV
	22.9.2006 to 8.11.2006	9.11.2006 to 29.3.2007	30.3.2007 to 8.7.2007	9.7.2007 to 31.3.2008
Total Cost (Power Component)	169430	329458	489477	645113
Add: Additional capitalization	-	-	-	5546
Capital cost during 2007-08 (Average)	-	-	-	647886

50. Based on the above regulations, O & M expenses considered for tariff is as under:

<i>(₹ in lakh)</i>	
From 22/9/2006 to 8/11/2006 Unit I)	334.00
From 9/11/2006 to 29/3/2007 (Unit II)	1909.00
From 30/3/2007 to 31/3/2007 (Unit III)	40.00
	2283.00
From 1/4/2007 to 8/7/2007 (Unit III)	1986.00
From 9/7/2007 to 31/3/2008 (Unit IV)	7059.00
	9045.00
From 1/4/2008 to 31/3/2009	10064.00

Interest on working capital

51. Clause (v) of Regulation 38 of the 2004 regulations provides as under:

(a) Working capital 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.

(b) Rate of interest on working capital shall be 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 shall be payable on normative basis notwithstanding that the generating company has not taken working capital loan from any outside agency.

52. Based on the above, interest on working capital has been calculated as under:

(a) **O&M Expenses:** One month O&M expenses has been considered based on the computations arrived at above.

(b) **Maintenance Spares:** The maintenance spares considered for tariff is as under:

<i>(₹ in lakh)</i>	
From 22/9/2006 to 8/11/2006 Unit I)	222.81
From 9/11/2006 to 29/3/2007 (Unit II)	1272.69
From 30/3/2007 to 31/3/2007 (Unit III)	26.82
	1522.32
From 1/4/2007 to 8/7/2007 (Unit III)	1324.00
From 9/7/2007 to 31/3/2008 (Unit IV)	4706.15
	6030.15
From 1/4/2008 to 31/3/2009	6733.50

(c) **Receivables:** Two months receivables have been considered for computation of working capital.

53. The SBI PLR as on 1st April of the year of COD of the unit/station, i.e. as on 1.4.2006 (for 3 Units) and 1.4.2007 (for the last unit) were 10.25% and 12.25% respectively. These have been considered by the petitioner. As such the interest rate of 10.25% for the year 2006-07 and 12.25% for the years 2007-08 and 2008-09 have been considered in tariff.

54. Based on the above, interest on working capital has been computed as per the details given below:

	<i>(₹ in lakh)</i>		
	2006-07	2007-08	2008-09
Maintenance Spares	1522.33	6030.15	6733.50
O & M expenses	190.25	753.75	838.67
Receivables	4069.01	16726.57	18473.79
Total	5781.59	23510.47	26045.95
Rate of Interest	10.25%	12.25%	12.25%
Interest on Working Capital	592.61	2880.03	3190.63

Annual Fixed Charges

55. The annual fixed charges allowed in this order for the period 2006-09 in respect of the generating station are summed up below:

	<i>(₹ in lakh)</i>		
	2006-07	2007-08	2008-09
Depreciation	3456.41	13737.24	15115.72
Interest on Loan	8498.38	33701.09	37192.56
Return on Equity	7932.54	31421.89	33615.55
Advance against Depreciation	1651.14	9574.17	11664.26
Interest on Working Capital	592.61	2880.03	3190.63
O & M Expenses	2283.00	9045.00	10064.00
Total	24414.07	100359.42	110842.71

Design Energy (DE)

56. The generating station was originally approved with a Design Energy of 2797 Million Units (MUs). However, the generating station has not been able to generate to its full Design Energy. The petitioner has submitted that during the period, various units of the generating station got commissioned successively. However, the Full Reservoir Level (EL 830.00 m) could not be achieved on account of non-approval of the above said height by the State Government of Uttarakhand, which is expected after completion of the pending rehabilitation work by the Government of Uttarakhand. The petitioner has further submitted that since the project/generating station was not in full operation during the period 2006-07, it would not be appropriate to compute the design energy for these years, on the basis of hydrology of 90% dependable year i.e. 2004-05. Hence, design energy for 2006-07 for the period 22.9.2006 to 31.3.2007, which also includes infirm energy generated by Unit Nos. I, II & III, has been calculated as 818.76 MUs on the basis of actual flows during 2006-07. The petitioner has also submitted that during the year 2007-08 and 2008-09, the FRL of EL 830.0 m was not achieved. The reservoir was filled during 2007-08 and 2008-09 upto EL 815.0 m and EL 820.0m respectively. Accordingly, the Annual Energy for the years 2007-08 and 2008-09 has been worked out as 2430.30 MUs & 2720.86 MUs respectively, corresponding to the hydrology for the year 2004-05 (90% availability year) which was utilized for working out the Design Energy of 2797 MUs. Therefore, the annual energy of 2430.30 MU for the year 2007-08, which also includes infirm energy generated by Unit-I and 2720.86 MU for the year 2008-09 are being submitted herewith and the Commission may allow the same as under:

Year	Design Energy
2006-07	818.76 MU
2007-08	2430.30 MU
2008-09	2720.86 MU

57. The respondent, PSPCL has submitted that the generation loss due to delayed commissioning has been over 1300 MUs and had this energy been available either as infirm power generated or as firm generation, the overall tariff would have been reduced.

58. The petitioner has submitted the detailed calculations for arriving at the modified design energy which have not been challenged by any of the beneficiaries. As such, the modified design energies as indicated in the table under para 56 are being allowed with the stipulation that secondary energy benefits shall be recoverable by the petitioner only beyond the design energy level of 2797 MU approved by the CEA.

59. The petitioner has also sought reimbursement of filing fee of ₹19,25,100/- lakh paid and the charges in respect of publication of the notice of the tariff petition. The petitioner's prayer for reimbursement of the filing fee is not allowed in view of the Commission's general order dated 11.9.2008 in Petition No.129/2005, wherein it was directed that filing fee during the period 2004-09 would not be reimbursed, as the same has been factored in the normalized O&M expenses under the 2004 Tariff Regulations. The petitioner has confirmed publication of public notices and submitted copies of the notices along with the claim vide its affidavit dated 20.9.2010. The petitioner is entitled to claim the reimbursement of actual expenditure incurred on

publication of notices in the newspapers directly from the respondents in one instalment in the ratio applicable for sharing of fixed charges.

60. In addition to the charges approved above, the petitioner is entitled to recover other charges also like incentive, claim for reimbursement of Income-tax, other taxes, cess levied by a statutory authority, and other charges in accordance with the 2004 Tariff Regulations, as applicable.

61. The petitioner is already billing the respondents on provisional basis in accordance with the Commission's interim directions. The provisional billing of tariff shall be adjusted in the light of final tariff now approved in three equal monthly instalments.

62. Petition No.250/2010 stands disposed of in terms of the above.

Sd/-
[M.Deena Dayalan]
Member

Sd/-
[V.S.Verma]
Member

Sd/-
[S.Jayaraman]
Member

Sd/-
[Dr. Pramod Deo]
Chairperson