

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

1. Shri R. Krishnamoorthy, Member
2. Shri Rakesh Nath, Member(Ex-officio)

**Review Petition No.133/2006
in
Petition No. 139/2005**

In the matter of

Review of the order dated 9.5.2006 in Petition No.139/2005-Approval of tariff for Unified Load Despatch and Communication (ULD&C) Scheme in Northern Region for the period from 1.4.2004 to 31.7.2017.

And in the matter of

Power Grid Corporation of India Limited, Gurgaon
Vs

Petitioner

1. Rajasthan Rajya Vidyut Prasaran Nigam Ltd, Jaipur
2. Ajmer Vidyut Vitaran Nigam Ltd., Ajmer
3. Jaipur Vidyut Vitaran Nigam Ltd,Jaipur
4. Jodhpur Vidyut Vitaran Nigam Ltd, Jodhpur
5. Himachal Pradesh State Electricity Board, Shimla
6. Punjab State Electricity Board, Patiala
7. Haryana Vidyut Prasaran Nigam Ltd, Panchkula
8. Power Development Department, Govt. of J&K, Srinagar
9. Uttar Pradesh Power Corporation Ltd., Lucknow
10. Delhi Transco Ltd, New Delhi
11. Chief Engineer, Chandigarh Administration, Chandigarh
12. Uttranchal Power Corporation Ltd, Dehradun
13. Bhakra Beas Management Board, Chandigarh

.....Respondents

The following were present:

1. Shri U.K. Tyagi, PGCIL
2. Shri V.V. Sharma, PGCIL
3. Shri M.M. Mondal, PGCIL
4. Shri C. Kannan, PGCIL
5. Shri R.S. Laucha, BBMB
6. Shri A.K. Garg, BBMB
7. Shri S.L. Bhatt, PSEB
8. Shri T.P.S. Bawa, PSEB
9. Shri P. Mallhotra, UPPCL
10. Shri Niraj Gulati, HVPNL

ORDER
(DATE OF HEARING: 27.12.2007)

The petitioner, Power Grid Corporation of India Ltd., has sought review of the methodology for calculation of recovery on return on equity and interest on loan capital adopted by the Commission in its order dated 9.5.2006 in Petition No.139/2005 pertaining to the approval of tariff for ULDC Scheme in Northern Region for the period 1.4.2004 to 31.3.2009.

2. The petitioner has submitted that the methodology adopted by the Commission for calculation of recovery of loan and equity would not enable it to recover the entire principal amount within the stipulated period of 15 years. The Commission in its order dated 10.9.2006 admitted the interlocutory application as a petition for review of order dated 9.5.2006 in petition No.139/2005 with further direction to the petitioner to file details of calculations of return on equity and interest on loan based on the proposed revised methodology, stating the reasons for change of methodology from the one proposed in the main petition.

3. The petitioner vide Annexure-I of its affidavit dated 27.10.2007 has filed detailed calculations of the charges on 'Equity-Central portion as on DOCO' in accordance with the Commission's order dated 9.5.2006 and as per the methodology proposed by it. The summary of calculation submitted by the petitioner is reproduced below:

(Rs. in lakh)		
Particulars	As per CERC order dated 9.5.2006	Proposed methodology
Equity as on DOCO (1.8.2002) for Central portion	2879.69	2879.69
ROE	14%	14%
Methodology adopted for calculating recovery factor	The recovery factor is based on 14% for 15 years on equity of	The recovery factor is based on 14% for 13 years 4

	2879.69	months on O/S principal amount as on 1.4.2004 of 2780.84
Total Revenue	7112.01	7140.88
Principal recovery amount equity	2796.20	2879.69

5. Considering the complexities involved in the issue raised, the Commission by its order dated 6.12.2006 constituted a one-member Bench with Shri Bhanu Bhushan, Member as the Presiding Member (hereinafter referred to as “the single-member Bench”) to make appropriate recommendations to the Commission for its consideration and appropriate decision. The single-member Bench after hearing the concerned parties submitted its recommendations vide order dated 14.3.2007. The order of the Bench shall be treated as part of the present order. Copies of the said order were sent to the concerned parties for their views and comments on the recommendations of the Bench. Respondent Nos. 5 and 13 have filed their comments on the recommendation of the Bench vide affidavits dated 28.5.2007 and 2.5.2007 respectively.

6. We have heard the parties present in the hearing. We have gone through the documents placed on record including the recommendations of the single member Bench.

7. We consider it worthwhile to visit the background of the case leading to the petitioner’s request for revision of methodology. Under the ULD&C Scheme in the Northern Region, the asset was declared under commercial operation on 1.8.2002. The petitioner approached the Commission by filing Petition No. 82/2002 in which

the petitioner proposed the concept of levellised tariff as against the conventional method of front-loaded tariff as per the tariff regulations of the Commission, keeping in view nature of equipment/services under the Scheme, the high initial cost and financial position of the constituents. The concept of levellised tariff entails uniform charges over the period of assumed life of the Scheme of 15 years for recovery of capital cost. The Commission calculated the charges for the ULD&C Scheme in Northern Region for the period upto 31.3.2004 by taking the weighted average rate of interest on loan @ 6.593% and return on equity @16%. Based on the weighted average rate of interest on loan and return on equity, the recovery factors for loan and equity were worked out as 0.107 and 0.1794 respectively based on the following formula:

$$\text{Recovery factor} = i(1+i)^n / (1+i)^n - 1$$

Where i= weighted average rate of interests and RoE and n=period

The Commission in its order dated 2.9.2005 in Petition No. 82/2002 allowed the annual charges and fees for the scheme calculated on the basis of the above formula.

8. The petitioner filed the Petition No.139/2005 for approval of the charges of the Scheme for the period 1.4.2004 to 31.7.2017 and additional capitalization during 2002-03 to 2004-05. The Commission in its order dated 9.5.2006 allowed the additional capitalization and approved the fees and charges for the current tariff period i.e. upto 31.3.2009. The Commission in para 21 to 24 of the said order adopted the following methodology for recovery of return on equity and interest on loan:

“22. ROE applicable @ 14% has been considered for the tariff purpose for the period 2004-09.

23. Based on weighted average rate of interest (6.037%) and ROE @ 14%, recovery factor,

- (i) for 15 years for capital expenditure up to 1.8.2002,
 - (ii) for 14 years for additional capital expenditure from 1.8.2002 to 31.3.2003, and
 - (iii) for 13 years for additional capital expenditure from 1.4.2003 to 1.3.2004,
- have been arrived as per the following formula:

Recovery Factor: $i(1+i)^n/(1+i)^n-1$
Where, i = Weighted average rate of interest and RoE
respectively and
n= period

24. Annual recovery corresponding to loan and equity for Central and State portions has been arrived as the product of loan corresponding to a particular constituent and respective recovery factor and the sum of both has been considered as annual recovery for each constituent.”

9. We note that the petitioner has no grievance against the methodology adopted for calculation of interest on loan and return on equity for determining the charges and fees for the period 1.8.2002 till 31.3.2004. However, the petitioner apprehends that it would not be able to fully recover the charges on the basis of the methodology adopted by the Commission in its order dated 9.5.2006. The single-member Bench has traced the genesis of the petitioner’s apprehension in para 8 of his recommendations which is extracted as under:

“The rate of ROE has been changed from 16% to 14% with effect from 1.4.2004. The weighted average interest rate for loans contracted for the project has also changed from 6.593% to 6.037%. However, in the tariff petition (139/2005) filed for the new tariff period from 1.4.2004, the petitioner claimed the same annual recovery factor as approved by the Commission for the previous tariff period. In other words, the changes in ROE rate and interest rate with effect from 1.4.2004 were not recognized and not given effect to. The Commission, therefore, did not accept the petitioner’s claim, and revised the annual recovery factors from 1.4.2004 based on the new rates, as specified in the order dated 9.5.2006.”

10. The single-member Bench has examined the issue in the following terms in paras 9 , 10 and 17 of his order dated 14.3.2007:

“9. In the present review petition, it has been pointed out by the petitioner that the methodology adopted by the Commission results in under-recovery of his investment. I have thoroughly examined the matter, and find the contention of the petitioner to be correct, as illustrated through the following example. Let us consider an equity input of Rs.100 on 1.4.2002. For ROE rate of 16% and corresponding annual recovery factor of 17.936%, the petitioner would get Rs.17.936 for the first two years, which would accumulate to Rs.38.742 by 31.3.2004, with annual compounding @16%. Taking into account the change of ROE rate to

12. In our view, the respondents have not commented on the methodology recommended by the single-member bench on merit, but have suggested that interest and equity should be calculated and recovered on monthly rest basis. In our view, the suggestion of the respondents falls outside the scope of the present application where the Commission is seized with the issue whether the methodology adopted in the order dated 9.5.2006 will ensure adequate recovery of the investments made by the petitioner. We agree with the single-member Bench that the question of monthly compounding vis-a-vis annual compounding of return on equity and interest on loan are generic in nature and can not be considered in isolation. We fully endorse the views of single-member bench on this point in para 16 of his order dated 14.3.2007 which is extracted hereunder:

“16. In view of the above, I do not recommend getting into the complexities associated with introduction of monthly compounding concept proposed by BBMB. I may point out that the issue is generic and not specific to levelised tariff or ULD&C schemes only. In all generation and transmission tariffs allowed by the Commission, the fixed charges, computed on annual basis, are collected through monthly billing with out considering interest payment frequency, etc. It would therefore, not be rational to consider monthly compounding for ULDC &C schemes in isolation.”

Moreover, the Commission is well aware of the fact that the present regulations do not address the terms and conditions for determination of tariff/fees and charges for ULDC system. The methodology followed for the ULDC system has been inherited from the previous tariff period when it was deliberated at length and the same was well accepted by the beneficiaries as well as the utility.

13. Coming to the main issue, we note that the single-member bench in para 9 of his order on a sample calculation has come to the conclusion that an equity element of Rs.100 will fetch Rs. 735.19 at the end of 15 years when calculated on the basis of the RoE rate of 16% for two years (corresponding recovery factor of 17.936%) and RoE rate of 14% for 13 years (corresponding recovery factor of 16.28%) as per the Commission's

orders dated 2.9.2005 in Petition No. 82/2002 and 9.5.2006 in Petition No. 139/2005 respectively. It has been further worked out that if the same equity of Rs.100 had been invested at 16% for two years and at 14% for the remaining 13 years, it would have accumulated to Rs.739.06 by 31.3.2017. It appears to us that the error in determination of the recovery factors for loan and equity in the Commission's order dated 9.5.2006 is the main reason for under-recovery of the cost of investment by the petitioner.

14. In para 23 of the Commission's order dated 9.5.2006, we find that based on the rate of interest of 6.037% and return on equity of 14%, the recovery factor has been calculated for 15 years for capital expenditure incurred up to 2.8.2002 whereas it should have been calculated for only 13 years 4 months on the outstanding principal amount as on 1.4.2004 by ignoring the period of 1 year 8 months pertaining to the tariff period 2001-04 for which the charges were calculated vide the Commission's order dated 2.9.2005 in Petition No.82/2002. We also note that the single-member Bench has recommended adoption of the methodology as per sheet-2 of Annexure-1 of petitioner's affidavit dated 27.10.2006. In the petitioner's methodology, the annual recovery factors for loans have been worked out on the basis of 14% RoE for a period of 13 years 4 months on the outstanding principal amount as on 1.4.2004 which is in conformity of our findings recorded in this paragraph.

15. In our view, an error has crept in para 23 of the Commission's order dated 9.5.2006 in Petition No. 139/2005 which needs to be rectified in the interest of justice and to ensure that the petitioner recovers the investments made by it over the life of the assets installed under the Scheme. In exercise of our powers under clause (f) of sub-

section (1) of Section 94 of the Electricity Act, we direct that para 23 of the order dated 9.5.2006 in the main petition shall be substituted as under:

23. Based on weighted average rate of interest (6.037%) and ROE @ 14%, recovery factor, for 13 years 4 months on

(i) the outstanding balance (as on 1.4.2004) of capital expenditure incurred up to 1.8.2002, and

(ii) the additional capital expenditure(as on 1.4.2004) incurred during the periods 1.8.2002 to 31.3.2003 and 1.4.2003 to 31.3.2004.

(iii) additional capitalization for the year 2002-03 is eligible for tariff in the financial year 2003-04, the capital recovery for which has been calculated considering 16% ROE and 6.593% interest on loan for a period of 14.33 years.

have been arrived as per the following formula:

$$\text{Recovery Factor: } i(1+i)^n/(1+i)^n-1$$

Where, i = Weighted average rate of interest and RoE respectively and
n= period

16. Based on our directions in the preceding paragraph, the annual fees and charges for the period 2004 to 2009 for the ULDC Scheme for Northern Region have been recalculated and allowed as under:

Calculation of ULDC Charges for capital expenditure as on 1.4.2004

Particulars	Central Portion			State Portion		
	On Cap. Exp. Upto DOCO	On Cap. Exp. From DOCO to 31.3.2003(including FERV)	On Cap. Exp. From 1.3.2003 to 31.3.2004(including FERV)	On Cap. Exp. Upto DOCO	On Cap. Exp. From DOCO to 31.3.2003(including FERV)	On Cap. Exp. From 1.3.2003 to 31.3.2004(including FERV)
Capital cost	24958.31	487.00	-496.90	29092.58	1401.22	-163.31
Notional Loan	22078.62	-152.71	-573.74	25735.88	-178.01	-668.78
Equity	2879.69	639.71	76.84	3356.70	1579.23	505.47
O/S loan as on 1.4.2004	20527.89	-145.99	-573.74	23928.28	-170.17	-668.78
O/S equity as on 1.4.2004	2780.84	625.86	76.84	3241.48	1545.05	505.47
No of years	13.3333	13.3333	13.3333	13.3333	13.3333	13.3333
Recovery Factor-Loan	0.111319	0.111319	0.111319	0.111319	0.111319	0.111319
Annual Capital Recovery Charge-Loan	2285.15	-16.25	-63.87	2663.68	-18.94	-74.45
Recovery Factor-Equity	0.169551	0.169551	0.169551	0.169551	0.169551	0.169551
Annual Capital Recovery Charge-Equity	471.49	106.12	13.03	549.59	261.96	85.70
Annual Capital Recovery Charge-Total	2756.64	89.86	-50.84	3213.27	243.02	11.26

O & M Expenses	1871.85	0	0	0	0	0
Interest on Working Capital	122.74	1.56	-0.88	55.85	4.22	0.20
Total Charges	4751.23	91.43	-51.72	3269.12	247.25	11.45

17. The ULDC charges for additional capital expenditure incurred during 2001-04 and allowed by the Commission have been worked out as under:

Calculation of ULDC Charges for Additional Capital Expenditure

Particulars	Central Portion		State Portion	
	On Cap. Exp. From DOCO to 31.3.2003(including FERV)	On Cap. Exp. From 1.3.2003 to 31.3.2004(including FERV)	On Cap. Exp. From DOCO to 31.3.2003(including FERV)	On Cap. Exp. From 1.3.2003 to 31.3.2004(including FERV)
Capital cost	487.00	-496.90	1401.22	-163.31
Notional Loan	-152.71	-573.74	-178.01	-668.78
Equity	639.71	76.84	1579.23	505.47
No of years	14.3333	-	14.3333	-
Recovery Factor-Loan	0.109967	-	0.109967	-
Annual Capital Recovery Charge-Loan	-16.79	-	-19.57	-
Recovery Factor-Equity	0.181643	-	0.181643	-
Annual Capital Recovery Charge-Equity	116.20	-	286.86	-
Annual Capital Recovery Charge-Total	99.41	-	267.28	-

18. Para 32 of the Commission order dated 9.5.2006 in the main petition shall stand modified in terms of the calculation of ULDC charges made in paras 16 and 17 above.

19. The Review Petition is disposed of in terms of the above order.

**Sd/-
(RAKESHNATH)
MEMBER**

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

New Delhi, dated the 11th April, 2008