

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 12/RP/2011

In

Petition No. 193/2010

Coram:

Shri Pramod Deo, Chairperson

Shri S. Jayaraman, Member

Shri V.S. Verma, Member

Shri M. Deena Dayalan, Member

Date of Hearing: 08.12.2011

Date of Order : 26.10.2012

In the matter of:

Review of Commission's order dated 5.5.2011 in Petition No. 193 of 2010 in respect of approval of transmission tariff for combined assets (a) 400 kV Ramagundam – Hyderabad D/C Transmission Line ; (b) 400 kV S/C Gooty – Neelmangala Transmission Line (c) 400 kV Hyderabad – Kurnool – Gooty Transmission Line and (d) 400 kV S/C Khammam – Nagarjunasagar Transmission Line along with associated base and equipment under Ramagundam Stage – III Transmission System in Southern Region for the period from 1.4.2009 to 31.3.2014 under Regulation 103 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999.

And In the matter of:

Tamil Nadu Generation and Distribution Corporation Ltd.

.... Review Applicant

Vs

Power Grid Corporation of India Ltd.

.....Respondent

The following were present:

1. Shri S Vallinayagam, Advocate, TANGEDCO
2. Shri S Balaguru, TANGEDCO
3. Shri S Raju, PGCIL
4. Shri R.B.Singh, PGCIL
5. Shri Gopalji, PGCIL

ORDER

This review petition has been filed by Tamil Nadu Generation and Distribution Corporation Ltd. (TANGEDCO) seeking review of the Commission's order dated 5.5.2011 in Petition No. 193/2010, wherein transmission tariff was approved for combined assets for (a) 400kV D/C Ramagundam-Hyderabad transmission line; (b) 400 kV S/C Gooty – Neelmangala Transmission Line (c) 400kV S/C Hyderabad-Kurnool-Gooty transmission line; and (d) 400kV S/C Khammam-Nagarjunasagar transmission line along with associated bays and equipment under Ramagundam stage-III transmission system in Southern Region for the period 1.4.2009 to 31.3.2014, based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter referred to as "2009 tariff regulations") after accounting for additional capital expenditure incurred during 2012-13. TANGEDCO has filed review petition seeking review on the limited question of allowance of additional capital expenditure for tower strengthening.

2. The Review Petitioner has submitted that the Commission approved additional capitalisation of ₹681.60 lakh during 2012-13 for 400kV D/C Ramagundam – Hyderabad transmission line and 400kV S/C Gooty – Neelmangla transmission line along with other reliefs claimed by the petitioner. While allowing the additional capital expenditure for 2012-13 for tower strengthening the Commission observed that the transmission lines were designed as per design of transmission line (Sl. No. 3 IS: 802-1995, with 0% Wind in Broken Wire Condition applicable from 1995-2001), which has now been modified to 75% Wind in Broken Wire Condition with narrow front wind, and it has necessitated strengthening of suspension type towers. The relevant portion

of the Commission's order allowing the additional capital expenditure for tower strengthening is as under:-

"15. It is observed that the transmission lines were designed as per design of transmission line (S.N 3 IS-802-1995, with 0% wind in broken wire condition applicable from 1995-2001), which has now been modified to 75% wind in BWC with narrow front wind. Due to this, strengthening of suspension type tower is required. The Standing Committee of Experts constituted by the Central Electricity Authority to investigate failure of transmission line towers during the months of January 2009 to June, 2009 has recommended that in order to minimize the failure in existing lines, hip bracing up to bottom cross level, in all the suspension towers of all the transmission lines designed after 1995 should be provided in different phases keeping in view of priority of the transmission lines and in future, PGCIL should make provision for hip bracing on all the suspension.

16. Keeping in view the design of towers for a lower standard, change of wind zone and the recommendations of the Standing Committee of Experts for strengthening of existing towers, we are of the view that projected additional capital expenditure towards strengthening of towers during the year 2012-13 are considered essential for efficient and successful operation of the transmission system. Since the expenditure are proposed to be incurred after the cut-off date, we relax the provisions of Regulation 9 (2) of the 2009 regulations in the light of our decision in order dated 8.2.2011 in Petition No. 176/2010 and allow capitalization of ₹ 681.60 lakh during 2012-13."

3. The review petitioner has sought review on the ground that there is an error apparent on the face of record in allowing the additional capital expenditure for tower strengthening.

4. The review petitioner has submitted the following grounds for review of the impugned order:-

- (i) The respondent, PGCIL, did not state in its petition that the towers were designed as per S. No. 3, IS: 802-1995, with 0% wind in broken wire condition (BWC) applicable from 1995-2001, which has now been modified to 75% wind in BWC with narrow front wind.

(ii) The petitioner in its vide affidavit dated 28.9.2010 in Petition No. 193/2010 has specifically put on record at paragraph 3 as under:-

“Now design practice mentioned at Sl. No. 5(IS: 802-1995 with 75% wind in Broken Wire Condition) is being followed from 2001 onwards and no incident of failure of towers on 400 kV transmission lines had occurred.”

(iii) The transmission lines were designed as per design of transmission line (S. No. 3 IS-802-1995, with 0% wind in broken wire condition applicable from 1995-2001), which has now been modified to 75% wind in BWC with narrow front wind is not on record and the said finding is contrary to the affidavit of the petitioner and facts of the case.

(iv) The petitioner cannot design towers using S. No. 3, IS: 802-1995, with 0% wind in broken wire condition applicable during 1995-2001 when the administrative approval of Government of India, Ministry of Power itself is dated 29.8.2001.

(v) The date of commercial operation of the present transmission assets viz. Ramagundam-Hyderabad T/L and Gooty-Neelamangala T/L was 1.11.2004 and 1.5.2005 respectively. It is clear from the records that the present assets in question were constructed as per S. No. 5 (IS: 802 – 1995 with 75% wind in Broken Wire Condition) and requires no strengthening at all.

(vi) SERC study report does not suggest for strengthening of suspension towers. PGCIL did not produce any document to suggest that the towers require strengthening.

(vii) As per the minutes of meeting held between the petitioner and SERC on 26.9.2009, SERC informed that the petitioner only has statistical records which are generally inadequate and rational information on data sampling etc. will be required to assess further design inputs for given specific site condition. Tower strengthening could be taken up only if the site conditions warrant supported by the actual data of increase in wind speed.

5. PGCIL has filed affidavits dated 26.8.2011, 29.11.2011 and 6.2.2012 clarifying the issues raised by the Commission and TANGEDCO.

6. We have considered the submissions of the petitioner. One of the grounds for review under Order 47 Rule 1 of CPC is error apparent on the face of record. The error must be patent and cannot be deducted on the basis of reasoning.

7. The main ground for review is that the respondent did not reveal in the Petition No.193/2011 that the transmission line was designed as per IS:802-1995 with 0% in broken wire condition applicable from 1995-2001. On the other hand, the respondent had submitted that design practice IS:802-1995 with 75% wind in broken wire condition is being followed from 2001 onwards. Since the Letter of Award was placed in February, 2002, the tower design should be as per IS:802-1995 with 75% wind in broken wire condition and not as per IS:802-1995 with 0% in broken wire condition as claimed by the PGCIL. As per the petitioner, this is an error apparent in the face of the order as the Commission has overlooked that as on the date of award, IS:802-1995 with 75% wind in broken wire condition had already been implemented.

8. The respondent in its affidavit, dated 26.8.2011 has submitted that there were failure of suspension towers designed as per IS 802-1995 with 0% wind in broken wire conditions. The issue of tower failures was deliberated in several Bureau of Indian Standard (BIS) Sub-Committee Meetings. Subsequently, BIS issued Draft Amendment to IS 802(Part-I/Sec-I):1995 for considering 75% full wind under security condition on suspension towers. As per the minutes of meeting of BIS Sub-Committee, the petitioner has started developing design of suspension tower as per IS:802-1995 along with 75% wind in broken wire condition and narrow front wind from 2001. The suspension towers designed before 2001 as per IS 802-1995 were used in lines constructed till 2003, when BIS in June 2003 decided to strengthen the suspension towers designed with 75% wind in broken wire condition (BWC). Further, the petitioner in its affidavit dated 29.11.2011 has submitted that the transmission lines covered in the present petition were designed as per IS-802-1995 with 0% wind in broken wire condition. The Committee formed by BIS in 2001 recommended the design of suspension towers with 75% wind in broken wire condition. The recommendations of the Committee were received in 2003. In accordance with the recommendations of the Committee, the design of suspension towers with 75% wind in broken wire condition has been implemented in the transmission lines thereafter. PGCIL in its affidavit dated 6.2.2012, has clarified that it started developing design of suspension towers with 75% wind after receipt of BIS letter in June 2003.

9. During the hearing on 8.12.2011, the learned counsel for the Review Petitioner referring to the RoP for the hearing on 23.12.2010 in Petition No.193/2010, submitted that according to PGCIL, the anemometers were being installed based on the report of the Standing Committee of experts on the failure of towers during January, 2009 to

June 2009 and the data of the anemometers were sent to Structural Energy Research Centre (SERC), Chennai and the feedback was awaited from SERC, Chennai. He further submitted that PGCIL had not furnished the SERC's report which suggested tower strengthening and the impugned order has been passed by the Commission without considering the SERC's report.

10. PGCIL in its affidavit dated 6.2.2012 has clarified that there were failures in 10 nos. transmission lines in the year 2009 and the strengthening of towers was to be carried out as per the recommendations of the Standing Committee of experts which investigated failure of towers of different lines where towers have collapsed. PGCIL has extracted the Committee's report of August, 2009, which is as under:--

"General Recommendations:

- (a) In order to minimize the failure in existing lines, hip bracing upto bottom cross level, in all the suspension towers of all the transmission lines designed after 1995 should be provided, in different phases keeping in view the priority of the lines.
- (b) In future, Powergrid will make provision for hip bracing on all the suspension towers of the new transmission lines."

Further to above recommendations, the Committee also recommended the following in respect of the tower collapse in 10 lines:

"Anemometers may be installed on the towers on 20 km line lengths (10 km on either side of the failure site)""

11. PGCIL has also submitted that both the above recommendations, i.e., hip bracing upto bottom cross level and installation of anemometers are independent activities and are not inter-dependent. PGCIL further submitted that to implement the recommendation of the Committee for installation of anemometers and for analyses of data recorded in anemometers, PGCIL associated with SERC, Chennai for wind speed measurement on some of the existing towers and to get advice on design wind

loading for using as input to the design of its future transmission lines. The recommendation for installation of anemometer on all towers over a stretch of 10 km on either side of the location where failure took place was a suggestion to enrich the meteorological data to have better understanding of wind velocity in various zones for future references. Accordingly, Nellore was identified for installation of anemometers for collection and analyses of wind velocity data for advice of design wind velocity under consultancy to be awarded to SERC. PGCIL has submitted that the strengthening of towers is a distinct activity and the report of SERC has no bearing on it. Strengthening of tower has been undertaken on the basis of the recommendations of the committee framed under the aegis of CEA. Moreover, the proposed additional capital expenditure for tower strengthening by PGCIL is a positive step towards the benefit of the beneficiaries to keep the maximum possible availability of the transmission systems. Thus, the additional capital expenditure allowed by the Commission in its order dated 5.5.2011 was not dependent on the report of SERC.

12. During the hearing on 8.12.2011, the Commission specifically asked the Review Petitioner as to whether grid security can be compromised by not allowing tower strengthening. The learned counsel replied in the negative. He further submitted that if the tower strengthening is necessitated because of the failure of respondent to incorporate suitable designs, then the respondent must bear such expenses. In response to the query of the Commission as to how it was mentioned in the affidavit dated 28.9.2010 in Petition No. 193/2010 that new design practice for suspension towers was being followed from 2001 onwards, it was clarified by the representative of the PGCIL that from 2001 onwards, PGCIL started designing towers

considering 75% wind in BWC and hence it was stated in the affidavit that IS:802-1995 with 75% BWC is being followed from 2001 onwards.

13. The respondent, along with its affidavit dated 6.2.2012, has enclosed the Minutes of Ninth Meeting of BIS dated 17.5.2001 regarding Use of Structural Steel in Overhead Transmission Line Towers and Switchyard Structures Subcommittee, wherein it was decided to increase the wind to 75% of full wind on suspension towers and to reduce the wind load to 75% of full wind on tension towers under security condition. An extract of the Minutes is as under:-

"Item 5. Comments on Printed Standards IS 802(Pt 1/Sec 1):1995 Code of Practice for Use of Structural Steel in Overhead Transmission Line Towers Part 1 Materials, Loads and Permissible Stresses Sec 1 Material and Loads.

The Committee considered the views of all members regarding the design parameters especially the wind loading on suspension and tension towers for design of transmission line towers. The Chairman narrated the justification for the existing provisions of the code.

After protracted deliberations on the issue including the techno-economic considerations and noting the number of failures since 1995 the suspension towers designed for nil wind under security condition, it was decided to increase the wind to 75% of full wind on suspension towers and to reduce the wind load to 75% of full wind on tension towers under security conditions.

The Committee also deliberated on narrow front wind. It was recommended that the tower shall be checked for narrow front wind with a wind speed of 1.5 times basic wind speed.

Considering the views of CEA on the Anti Cascading Condition stipulated in IS: 802 and above provisions of wind loading under security conditions, it was decided to delete clause 14. Based on the above, the Subcommittee recommended to process an amendment on wide circulation.

It was further decided to seek the specific confirmation of Subcommittee members to the above changes and if no comments are received within one month of issue of these minutes, the same will tantamount to their confirmation to the above changes. A meeting of Subcommittee may again be conveyed at the earliest to review the above recommendations, if required in consultation with the Convener."

14. Along with the affidavit dated 6.2.2012, the respondent has also enclosed a document on the subject titled "Technical Committee: Structural Sections and Structural Engineering Section Committee, CED 7" wherein comments were invited by 16.9.2003 on the "Draft Amendment No. 1 to IS: 802 (Part1/Sec. 1): 1995 use of structural steel in overhead transmission line Part 1 Materials and Loads and Permissible Stress Section 1 Materials and Loads (Third Revision)". On perusal of the Minutes of the BIS and the proposed draft amendments, it is clear that though a decision was taken to change the design of the suspension towers in May 2001, changes to the existing design specification was made only in 2003. Thus, the respondent could not have incorporated changes in the design of the suspension towers since the Investment Approval was accorded by Ministry of Power in August 2001 and LOA was placed in February 2002. Therefore, the towers of the subject transmission line was designed as per IS: 802 1995 with 0% wind in broken wire condition.

15. The Commission in the impugned order has observed that the transmission line was designed as per Sr. No. 3 (IS: 802-1995) with 0% wind in broken wire condition and based on the recommendations of the Standing Committee of Experts appointed by CEA, the strengthening of transmission towers was necessitated. We do not find any error in the impugned order.

16. Review Petition No. 12/RP/2011 is dismissed in view of the reasons recorded above.

sd/-
(M. Deena Dayalan)
Member

sd/-
(V.S. Verma)
Member

sd/-
(S. Jayaraman)
Member

sd/-
(Dr. Pramod Deo)
Chairperson