

**Before the Appellate Tribunal for Electricity
(Appellate Jurisdiction)**

I.A. Nos. 233, 278 & 279 of 2014
in
Appeal No. 25 of 2014

Dated: 29th November, 2014

**Present: Hon'ble Mr. Justice M. Karpaga Vinayagam, Chairperson
Hon'ble Mr. Rakesh Nath, Technical Member**

In the matter of:

M/s. SESA Sterlite Limited,
Sesa Ghor 20 EDC Complex Patto,
Panjim,
GOA-403 001

....Applicant

Vs.

1. Odisha Electricity Regulatory Commission,
Bidyut Niyamak Bhavan, Unit-VII,
Bhubaneswar-751 012
2. GRIDCO Limited,
Janpath,
Bhubaneswar-671 022

... Respondents

Counsel for the Applicant(s) : Mr. Amit Kapur,
Ms. Poonam Verma,
Mr. Akshat Jain

Counsel for the Respondent(s) : Mr. G. Umapathi,
Mr. Rutwik Panda,
Ms. Anshu Malik for R-1
Mr. Pradeep Misra
Mr. Manoj Kr. Sharma for SLDC
Mr. Raj Kumar Mehta,
Ms. Ishita Chaudhary Das Gupta,
Mr. Elangbam for R-2

ORDER

Rakesh Nath, Technical Member

IA No. 278 of 2014 has been filed by GRIDCO in Appeal no. 25 of 2014 seeking modification of the direction in the Interim Order of this Tribunal dated 28.03.2014 to the extent that Capacity Charges for 2010-11 to 2013-14 must be computed on the basis of PAFM considering installed capacity of 600 MW. IA no. 233 of 2014 has been filed by SESA Sterlite Ltd. for implementation of the Interim Order.

2. GRIDCO has sought modification of the Interim Order dated 28.03.2014, *inter alia* on the following grounds:-

- (i) The direction for working out Capacity Charges for FY 2010-11 to 2013-14 on the

basis of PAFM computed considering the transmission constraints of 400 MW instead of installed capacity of 600 MW was given by this Tribunal on the premise that GRIDCO has not challenged the Odisha Commission's Order dated 12.06.2013 (Impugned Order) wherein it has been accepted by the Odisha Commission that the double circuit transmission line is capable of carrying power around 400 MW in sustainable mode.

- (ii) The Double Circuit Line between SEL and Budhipadar Grid sub-station of OPTCL is capable of carrying more than 500 MW of power without endangering the safety of the Line in any manner.

(iii) Since the burden of Capacity Charges has to be passed on to the consumers of Odisha, it is expedient in the interest of justice that the direction in the Interim Order relating to working out Capacity Charges for FY 2010-11 to 2013-14 on the basis of PAFM be modified considering the capacity of the Double Circuit Line as 600 MW instead of 400 MW.

3. The facts of the matter are discussed briefly as under:

- a) SESA Sterlite Limited a generating company in terms of Section 2(28) of the Electricity Act, 2003, having set up a 4x600 MW (2400 MW) Thermal Power Plant at Brundamal, Jharsuguda, Odisha, has filed Appeal No. 25 of 2014 before this Tribunal challenging the

Order dated 12.06.2013 passed in Case No. 117 of 2009, 31 of 2010 and 56 of 2012 (“Impugned Order”) by the Odisha Electricity Regulatory Commission (Odisha Commission). Along with the Appeal, an I.A. No. 35 of 2014 was filed seeking , *inter alia*, stay of the operation of the Impugned Order and direction to 2nd Respondent GRIDCO to maintain status quo as existed prior to the 2013 Impugned Order.

- b) The Tribunal disposed of I.A. No. 35 of 2014 by way of the Interim Order dated 28.03.2014 recognizing the inherent capacity limitations of the 220 KV SEL – Budhipadar Double Circuit line *inter alia* directing:-

“i) There is no dispute regarding the Annual Fixed Charges for unit no. 2 for the period

2010-11 to 2013-14. The Capacity Charges payable to the Applicant/Appellant for the FYs 2010-11 to 2013-14 shall be worked out based on Plant Availability Factor computed considering the transmission constraints with capacity of 400 MW of the 220 KV Double Circuit line from the SESA Sterlite Plant to Budhipadar sub-station of OPTCL instead of installed capacity of 600 MW. Orissa SLDC is directed to compute the Plant Availability Factor for the FYs 2010-11 (from November 2010) to 2013-14 as per the above directions and inform the Appellant and GRIDCO within 30 days of passing of this order. The Applicant/Appellant will raise the bills for the FYs 2010-11 to 2013-14, reworking the Capacity Charges based on the Plant Availability Factor determined by the SLDC and Energy Charges for respective financial years determined in the impugned order....”.

4. Mr. R. K. Mehta the learned counsel for Gridco made following submission in support of its contention that the capacity of the 220 kV D/C line between SESA and Bhudipadar is more than 500 MW.

a. As per CEA's Planning Criteria, 2013, thermal loading limit of ACSR conductor (597 Sq. mm) is 798 Amps per circuit at 45°C Ambient Temperature and 85°C Conductor temperature. Thus the transmission capacity of line works out to be 274 MW per circuit or 548 MW for double circuit line.

b. As per specifications published by Sterlite the thermal loading limit of ACSR Moose Conductor (597 Sq mm) is 1092 Amps at 40°C ambient and 80°C conductor temperature. Thus the capacity of line works out to be 748 MW for double circuit line.

c. Loadflow studies conducted by OPTCL indicate that 550 MW of power could be safely evacuated through the line in question.

5. Mr. Amit Kapur the learned counsel for the Appellants countered the contentions of the Gridco and submitted that the line in question was designed for 75°C maximum conductor temperature and is capable of carrying 400 MW only at 45°C ambient temperature. The gist of the contention of the Appellants are:

- (a) The line in question was built in 2006. Therefore, CEA's Manual published in Jan 2013 has no application in the present case. It is clear from clause 2.1 wherein it is stated that the provisions of the

Planning Criteria would be applicable from 1.2.2013.

- (b) Since the line was built in 2006 the provisions of CEA' Manual on Transmission Planning Criteria published in the year 1994 would be applicable to the present case. As per 1994 criteria the thermal loading capacity of Moose Conductor (520 Sq mm) at 45°C ambient temperature and 75°C maximum conductor temperature is 595 Amps. Thus, the capacity of line works out to be 204 MW per circuit or 408 MW for double circuit line.

- (c) The line has been designed for 75°C maximum conductor temperature as per CEA's 1994 Manual and BIS Standard IS:802.
- (d) Loading the line at higher temperature would result in increase in Sag thereby reducing the minimum ground clearances making the line safety hazard.
- (e) Loadflow studies cannot tell the loading limit of a line. These studies compute the power flows on various transmission elements depending upon load, generation at various nodes. These studies cannot tell temperature rise on the conductor during overloading.

6. We have heard the learned counsels for the parties. The only question arises for our consideration

in these proceedings for IA is whether there is a *prima facie* case for reviewing our interim order dated 28.3.2014 in view of the submissions of GRIDCO that the line capacity is 600 MW and not 400 MW?

7. Let us examine this issue in view of the contentions made by the parties.

8. CEA's planning criteria as referred to by GRIDCO is that of 2013. Prior to that CEA's 1994 Manual was in vogue and the provisions of this Manual provided criteria for thermal loading capacity of Moose conductor (520 Sq. mm) at 45°C ambient temperature and maximum conductor temperature of 75 °C as 595 Amp or 204 MW. Further, the **Indian Standard IS 802 (Part 1/Sec 1):1995 of Bureau of Indian Standards** provides that "*In order to permit additional current carrying capacity in the conductor the maximum*

temperature in the ACSR conductor has now been permitted to be 75 degree centigrade in any part of the country". These two documents *prima facie* support the contentions of the Appellant that the line was designed for 75°C maximum conductor temperature. The learned counsel for the Gridco argued that the conductor size of Moose conductor used for the line is 597 Sq mm. CEA's 1994 Manual give line loading for Moose Conductor of 520 Sq mm. and CEA's 2013 Manual considered Moose Conductor of 597 Sq mm. Therefore, the provisions of 2013 Manual only would be applied. Accordingly, 85°C maximum conductor temperature have to be considered for computing line loading limit.

9. Perusal of CEA's 2013 Manual would indicate that CEA's specified three ratings for maximum

conductor temperature of 65° C, 75° C and 85° C. This shows that the maximum permissible conductor temperature is not the sole criteria for determining the designed maximum temperature for any line.

10. A transmission line towers are designed for the maximum permissible Sag in the lowest conductor of the line considering ground and other statutory clearances as per CEA's Safety Rules framed under Section 56 of the Act. A line designed for 65° C would not be allowed to operate from safety considerations at any higher temperature even if its conductor is capable to withstand 85° C without losing its physical characteristics.

11. In view of provisions of IS:802 of BIS, *prima facie*, it appears that the Appellant's line was designed for maximum Conductor Temperature of 75°C. CEA's

1994 Manual gives thermal loading limit for Moose Conductor of 520 Sq mm and the actual size of conductor used in the line is 597 Sq mm. CEA's 2013 Manual gives Ampacity of 597 Sq mm Conductor at 45° C Ambient Temperature and 75°C maximum conductor as 631 Amps. With this capacity the thermal loading limit of the double circuit line may be around 430 MW. Leaving the operational margins, a capacity of 400 MW as decided by the Commission in the Impugned Order appears to be correct. This will however, be subject to our finding in the final order.

12. Therefore, we do not find any need to modify our Interim order dated 28.3.2014. Accordingly, IA nos. 278 & 279 of 2014 are dismissed.

13. In view of above, we direct GRIDCO to implement our interim order at the earliest. Accordingly, IA No.

233 of 2014 filed by SESA Sterlite Ltd. is also disposed of.

14. However, we direct GRIDCO and SESA Sterile to consider exploring the possibility of evacuation of the full output of the power plant by operating the power plant in closed loop with Power Grid's transmission system.

15. Post Appeal No. 25 of 2014 alongwith Appeal No. 179 of 2014 for further hearing on **18th December, 2014.**

(Rakesh Nath)
Technical Member

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(Justice M. Karpaga Vinayagam)
Chairperson

REPORTABLE/NON-REPORTABLE

Vs