सत्यमेव जयते

भारत सरकार / Government of India

विद्युत मंत्रालय / Ministry of Power

केंद्रिय विद्युत प्राधिकरण / Central Electricity Authority

तापीय यांत्रिकी एवं अभियांत्रिकी विकास प्रभाग

Thermal Engineering & Technology Development Division

संख्या: CEA/TETD-TT/2019/N-15/271 **दिनांक : 20.02.2019**

सेवा में

सचिव,
केंद्रीय विधुत विनियामक आयोग,
तीसरी और चौथी मंजिल,
चंद्रलोक बिल्डिंग, 36, जनपथ,
नई दिल्ली - 110 001

विषय: CERC Terms and Conditions of Tariff for the tariff period starting from 01.04.2019 – Operation Norms for gas based Stations of NEEPCO - के बारे में.

महोदय,

We are in receipt of NEEPCO's letter dated 01.02.2019 (copy enclosed) requesting for increased auxiliary energy consumption (AEC) norm for their Agartala Gas Turbine Combined Cycle Plant (AGTCCP). They have requested for additional AEC of 1% to be recommended for AGTCCP having dry cooling system- direct cooling air cooled condensers (ACC) with mechanical draft fans as allowed for coal based generating plants.

2. It is to mention that in the recommendations furnished to CERC by CEA vide letter dated 10.12.2018, relaxed norms were indicated for APC in case of CCGT power stations for Tripura CCPP (101 MW - APC as 4.2%), Palatana CCPP (726.6 MW – APC as 3.5%) & Kayamkulam CCPP (359.58 MW- APC as 2.7%) based on consideration of design AEC values indicated in the operation data furnished to CEA and issues as analysed at our end. Discussions were also held with NEEPCO regarding various aspects of operation norms for their CCGT stations.

3. In case of AGTCCP, The two STGs have been installed in the plant in 2015- 16. As per operation data furnished to CEA, the AEC of the plant in CCGT mode works out to 3.11% for 2016- 17 and 3.42% for 2017- 18. The design AEC was considered as 2.36% based on design/ guaranteed AEC of 72 kW for each GTG and 1450 kW for each STG for 4x21+2x25.5 MW plant furnished by NEEPCO. Since, design AEC so worked out was less than existing norm of 2.5%, no relaxed AEC norm was recommended for AGTCCP vide our letter dated 10.12.2018 to CERC.

4. In their letter dated 01.02.2019, NEEPCO has mentioned that AEC of GTG and STG furnished to CEA were based on PG test data and it did not include for other consumptions like air conditioning, ventilation, pumps & motors associated with auxiliary system, transformation losses in Generator Transformers (single phase). Vide e-mail dated 18.02.2019, NEEPCO have furnished (i) motor ratings of essential auxiliaries of GTG, STG, BOP loads amounting to total of

4057.92 kW (ii) installed rated loads of Air Conditioning machines in their CCGT plant amounting to total of 759.67 kW and (iii) CPRI assessed transformer losses amounting to total of 639.24 kW. As per this, total auxiliary load including losses is indicated as 5456.83 kW amounting to 4.04% of installed capacity of 135 MW. However, power/ energy consumption values as per equipment design/ guarantee test have not been furnished.

5. Based on details furnished by NEEPCO, an assessment of design auxiliary energy consumption of AGTCCP has been made at our end. Considering actual energy consumption appropriately as 85% of motors rating for GTG, STG & BoP essential loads, 50% for average AC (air conditioning) loads and transformer losses as per CPRI assessment, the design auxiliary energy consumption of AGTCCP works out to 4468.31 kW amounting to 3.31% (including for implication of air cooled condensers for STGs) of rated gross output of the CCGT plant (135 MW).

6. The issue of air cooled condensers for STGs in CCGT plant has also been examined for its impact on auxiliary energy consumption of the plant. It is to mention that the coal based plants with air cooled condenser are provided with additional AEC of 1% as per the CERC tariff Regulation 2014-19. In case of AGTCCP, the contribution of STGs is 51 MW in total CCGT capacity of 135 MW. As per this consideration, weighted average additional AEC on account of ACC in AGTCPP amounts to about 0.38%. Further, in general, STG capacity is about one third of CCGT capacity. As such, additional AEC norm of 0.35% is considered to be reasonable for CCGT station having air cooled condenser (ACC) for STGs.

7. In line with above, the following is recommended:

i) **In case of AGTCCP (NEEPCO), relaxed auxiliary energy consumption (APC) norm of 3.3% (including for impact of air cooled condensers for STGs) be considered as based on assessed design auxiliary energy consumption of the AGTCCP.**

ii) **An additional auxiliary energy consumption (APC) norm of 0.35% be considered for CCGT stations having direct cooling air cooled condensers (ACC) with mechanical draft fans for STGs.**

This issues with the approval of Chairperson, CEA.

संलग्नक: यथोपरी.

भवदीय,

सुनीत गुप्ता 20/02/2019

(सुनीत कुमार गुप्ता)
उप - निदेशक

Copy for kind information to: i) अध्यक्ष, के.वि.प्रा.
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iii) सदस्य (E&C), के.वि.प्रा.

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ISO 9001-2000
ISO 14001-1996
OHSAS 18001-1999

नॉर्थ ईस्टर्न इलेक्ट्रिक पावर कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
NORTH EASTERN ELECTRIC POWER CORPORATION LTD.
(A GOVT. OF INDIA ENTERPRISE)
कार्यपालक निदेशक (ओ एण्ड एम) का कार्यालय
OFFICE OF THE EXECUTIVE DIRECTOR (O&M)

No.-NEEPCO/ED(O&M)/OPR-38 / 3669 Date 01.02.2019

To

The Chief Engineer
TETD, Central Electricity Authority
9th Floor, SEWA BHAVAN
R. K. Puram, New Delhi-110 066

Sub: - Operation norms for gas based Stations of NEEPCO

Ref: - 1. Letter bearing no.-CEA/TETD-TT/2018/N-15/431 dated 27.04.2018
2. Letter bearing no.-CEA/TETD-TT/2019/N-15/203-204 dated 28.01.2019

Sir,

While inviting reference to content of the referred letter, following are placed before you for favorable consideration:-

1. In response to the letter referred at sl. No.-1, the actual operational data for last 5 (five) years was submitted from NEEPCO vide letter dated 28.05.2018. The operational data submitted shows the trend of APC corresponding to the actual generation. The actual APC for the given period is reproduced below:-

year	2013-14	2014-15	2015-16	2016-17	2017-18
Gross Energy (MU)	641.651	628.7038	871.2305	915.396	688.214
APC (MU)	9.902	10.9586	26.564	28.332	25.658
APC (%)	1.543	1.743	3.049	3.095	3.728

2. CEA, vide letter dated 11.06.2018 had asked to furnish APC of gas turbine module. It may kindly be noted that APC of individual GT module was recorded at the time of PG test only which was conducted around 20 years ago during initial stage of commissioning. Accordingly, PG test data was provided from NEEPCO vide letter dated 27.06.2018 in response to specific query of CEA.

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OFFICE OF THE EXECUTIVE DIRECTOR (O&M)

3. It may please be noted that APC for individual Gas Turbine is not calculated and the total APC for the entire Station i.e. for four gas turbines and two steam turbines are recorded and same had been submitted to CEA as stated in sl. no.-1.

4. In the letter referred at sl. no.-2, APC for each GTG was considered as 72 KW and for each STG as 1450 KW as per the PG test. However, apart from direct consumption of GTG & STG, other consumption like Air Conditioning, ventilation, pumps & motors associated with auxiliary system, transformation loss in Generator Transformers (single phase) contributing to power consumption have not been considered for calculation of APC as it was not reflected in the PG test report.

5. Further, part loading of units for fulfilling the 55% Technical minimum criteria has also led to substantial increase in percentage of APC.

6. The issue had been discussed in detail in the meeting held on 27.07.2018, and the difficulties faced by the Plant were elaborated during the course of discussion in line with our data submitted vide letter dated 28.05.2018.

   In view of the foregoing and considering the actual APC for the station as a whole, additional APC of 1% for AGTCCP, having Dry Cooling Systems- Direct cooling air cooled condensers with mechanical draft fans may be recommended to CERC as allowed for coal based generating plants.

   Thanking you.

Yours faithfully

(H. K. Deka)
General Manager (O&M)

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