सत्यमेव जयते

भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
ग्रिड प्रबंधन प्रभाग/ Grid Management Division
****

सं.: 12/एक्स/एस.टी.डी.(सी.ओ.एन.एन)/जी.एम./2023/743 **दिनांक: 26.07.2023**

विषय: दिनांक 24.05.2023 (बुधवार) को अपराह्न 03:00 बजे सदस्य (GO&D), सीईए की अध्यक्षता में CEA (Technical Standards for Connectivity to the Grid) विनियमों के अनुपालन से संबंधित मुद्दों पर आयोजित कार्य समूह बैठक का कार्यवृत्त।

Minutes of the Meeting of the Working Group held on 24.05.2023 (Wednesday) at 03:00 PM under the Chairmanship of Member (GO&D), CEA on issues related to the compliance of CEA (Technical Standards for Connectivity to the Grid) Regulations.

सदस्य (GO&D), सीईए की अध्यक्षता में दिनांक 24.05.2023 (बुधवार) को अपराह्न 03:00 बजे आयोजित कार्य समूह बैठक के कार्यवृत्त आपकी जानकारी एवं आवश्यक कार्यवाही हेतु संलग्न है। **यह पत्र सक्षम अधिकारी द्वारा अनुमोदित है।**

Please find enclosed the minutes of the meeting of the Working Group held under Chairmanship of Member (GO&D), CEA on 24th May 2023 at 03:00 PM. It is issued on approval of Competent Authority.

संलग्नक: यथोपरि।

(चंद्र प्रकाश) 26/7/2023
(मुख्य अभियन्ता)

बैठक के सभी प्रतिभागियों को ई-मेल द्वारा प्रेषित

Minutes of Meeting of the Working Group held on 24.05.2023 (Wednesday) at 03:00 PM under the Chairmanship of Member (GO&D), CEA on issues related to the compliance of CEA (Technical Standards for Connectivity to the Grid) Regulations.

Member (Grid Operation & Distribution), CEA, Chairperson of the Working Group welcomed the participants to the meeting on issues regarding selection of ambient temperature for operation of RE plants, use of software tool for harmonic analysis of RE plant and the standard operating procedure for CON-4/ FTC. The list of the participants is enclosed at **Annexure-I**. Member (GO&D), CEA directed to take up the agenda items one by one.

2. Agenda Item 1: Selection of Ambient Temperature for RE plants.

2.1 Grid-India stated that the Working Group had not suggested any new regulation or standard for compliance by RE plants rather it only clarified the understanding of various provisions of CEA (Technical Standards for Connectivity to the Grid) Regulation for the stakeholders.

2.2 The RE developers stated that the net DC output of any RE plant shall not be at its peak during the high temperature period either due to low irradiance or low wind speed and accordingly power availability would be reduced. They added that though there shall be a decrease in active power generation with increase in temperature, the PV inverters will be delivering more reactive power during such high temperature periods considering the inverter margins available due to such reduction in active power.

2.3 Grid-India informed that based on the documents submitted by RE developers, it is noted that Wing Turbine Generators (WTGs) of different makes have different temperature dependent de-rating of their capabilities. WTG models from SGRE start de-rating above ambient temperature of 38° C, GE and Senvion start de-rating above 40° C. Beyond 45° C, the capability of most of the WTGs becomes zero. In case of solar plants, the inverters start de-rating beyond 50 °C. All inverters are tested at 50° C to provide the rated output at unity power factor.

2.4 Member GO&D, CEA sought the temperature reference values defined in IEC standards. NIWE quoted that as per IEC 61400-1-2019, design of wind turbine shall consider two conditions for temperature:

"6.4.2 Normal other environmental conditions

Normal other environmental conditions values that shall be taken into account are following:

- *ambient temperature range of –10 °C to +40 °C*

6.4.3 Extreme other environmental conditions

6.4.3.1. General:

Extreme other environmental conditions that shall be considered for wind turbine design are temperature, lightning, ice and earthquakes.

6.4.3.2. Temperature

The extreme temperature range for standard wind turbine classes shall be at least –20 °C to +50 °C."

2.5 Grid-India further explained that in order to inject/ absorb 33% (±0.95 pf) reactive power (MVAr) along with delivering rated active power (MW) at Point of Interconnection (PoI), the MVA capacity of the RE plant needs to be higher than the rated MW capacity of the RE plant i.e., MVA Capacity should be more than MW Capacity. However, the RE plant developers are seeking ISTS grid connectivity by using capacity of inverters which can deliver their rated active power output at ambient temperature of 50^0C at unity power factor only, hence the MW equals MVA.

2.6 CTUIL representative suggested that to take care of the issue of lower efficiency during high temperature periods, additional DC capacity may be installed to deliver the rated active power (as per connectivity granted) at the PoI. It was further mentioned that reduction of active power with increase in temperature needs to be analyzed from Grid security point of view and the number of such instances along with quantum of such active power curtailment due to rise in temperature needs to be documented so that the impact of this phenomenon on Grid security could be ascertained.

2.7 Chief Engineer (Grid Management Division), CEA stated that there is need to re-look atthe temperature criterion in the interest of optimization of resources w.r.t. grid security.

3. Agenda Item 2: Harmonic modelling of RE plants.

3.1 Grid-India submitted that irrespective of the software tool used for simulating the harmonic current injection by solar PV and WTG models, the simulation result would not vary with the software used if modeling is done correctly. Requirement of submission of EMT model compatible with PSCAD has already been deliberated by working group and all the developers are already submitting their models in PSCAD to CTUIL and Grid-India. Members generally were of the view for continuing submission of PSCAD compatible generator models to CTUIL and Grid India.

3.2 CTUIL stated that both Grid-India and CTUIL are using the PSCAD software for all EMT studies. Therefore, PSCAD software may be continued for conducting harmonics study.

3.3 Member (GO&D), CEA directed that the simulation studies output should be independent of software tools and the power quality output as envisaged in CEA Connectivity Standards and shall be as per relevant IEEE standards.

4. Agenda Item 3: Standard operating procedure for CON-4/ FTC.

4.1 CTUIL mentioned that Standard operating procedure for CON-4/ FTC such as list of studies along with other requirements have already been detailed in the Report of the Working Group. Therefore, there is clarity in the matter.

4.2 Member (GO&D), CEA observed that CTUIL/ Grid-India need sufficient time to process the applications received from the RE developers and therefore advised the RE plant

developers to continue submitting their models and other information sought in CON-4 / FTC procedure as per time limits mentioned in the working group report.

The meeting ended with thanks to the chair.

****

Annexure-I

List of participants in the meeting on 24/05/2023 at 03:00 PM

Central Electricity Authority (CEA)

1. Sh. B.K. Arya, Member (GO&D), CEA -- in Chair
2. Sh. Chandra Prakash, Chief Engineer (Grid Management)
3. Sh. Sandeep Kumar, DD (Grid Management)
4. Sh. Himalaya Shubham, DD (Grid Management)
5. Sh. Shubhender Singh, AD (Grid Management)

Grid-India

1. Sh. Surajit Banerjee, CGM
2. Sh. Abhijeet Prakash, Chief Manager
3. Sh. Prabhankar Porwal, Manager

Solar Energy Corporation of India (SECI) Limited

1. Sh. Shreedhar Singh, AGM

CTUIL

1. Sh. P S Das, Sr. General Manager

Representatives from OEM and RE Developers.