सत्यमेव जयते

भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
ग्रिड प्रबंधन प्रभाग/ Grid Management Division
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सं.: 12/एक्स/एस.टी.डी.(सी.ओ.एन.एन)/जी.एम./2024/381 दिनांक: 07.08.2024

विषय: दिनांक 26.07.2024 (शुक्रवार) को सुबह 11:00 बजे अध्यक्ष, के.वि.प्रा. द्वारा CON-4 और FTC अनुमोदन के लिए पवन ऊर्जा संयंत्रों के लंबित आवेदनों पर चर्चा करने के लिए बैठक का कार्यवृत्त।

Subject: Minutes of the Meeting taken by Chairperson, CEA, on 26.07.2024 (Friday) at 11:00 AM to discuss the pending applications of Wind Power Plants for CON-4 and FTC approval.

अध्यक्ष, के.वि.प्रा., की अध्यक्षता में दिनांक 26.07.2024 को अपराह्न 11:00 बजे आयोजित बैठक का कार्यवृत्त आपकी जानकारी एवं आवश्यक कार्यवाही हेतु संलग्न है।

Please find enclosed herewith the minutes of the meeting held under the Chairmanship of Chairperson, CEA on 26.07.2024 at 11:00 AM., for information and necessary action

संलग्नक: यथोपरि।

7/8/2024.

(बी लिंगखोई)
मुख्य अभियंता (ग्रिड प्रबंधन)

बैठक के सभी प्रतिभागियों को ई-मेल द्वारा प्रेषित

Minutes of the Meeting taken by Chairperson, CEA, on 26.07.2024 (Friday) at 11:00 AM to discuss the pending applications of Wind Power Plants for CON-4 and FTC approval

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List of the participants is enclosed at **Annexure-I.**

2. At the outset, Chairperson, CEA, welcomed the participants and mentioned that the meeting had been scheduled to discuss the issues in grant of CON-4 and FTC to Wind Power Plants which are ready for commissioning. He requested Member (GO&D), CEA, to outline the brief background and present the project-wise issues in grant of grid connectivity to these Wind Power Plants.

3. Member (GO&D), CEA, mentioned that Wind Power Producers Association (WIPPA) had made representations before the Ministry of Power (MoP) highlighting the issues in obtaining approvals of CON-4 and FTC due to the condition that Wind Turbine Generators (WTGs) must operate without de-rating at the extreme temperatures specified in the CEA procedure for various wind locations across the country. In the context of the said representations, Secretary (Power) had taken a meeting on 30.05.2024 with CEA, Grid-India, CTUIL and WIPPA. The said meeting was followed by a joint meeting of Secretary (Power) & Secretary (MNRE) with all concerned on 01.06.2024. Subsequently, vide communication dated 14th June,2024, Ministry of Power (MoP) had conveyed the decision taken in the said meetings whereby CEA is to issue necessary instructions for granting CON-4 and FTC approval to wind energy projects, which are ready for commissioning, provided that the wind turbines are compliant with relevant IEC standards.

He further presented the list of ten (10) projects ready for commissioning with pending connectivity quantum of around 3000 MW (list attached at **Annexure II**), as consolidated based on the inputs from CTUIL. He mentioned that a total of six (6) projects – 3 Wind Projects and 3 Wind-Solar Hybrid Projects, with total connectivity quantum of 1995.9 MW were in Southern Region and four (4) Nos. Wind Projects with total connectivity quantum of 947 MW were in Western Region, for which grant of CON-4 approval was pending. The project-wise status of the compliance of WTGs and Solar Inverters with the extreme temperature condition corresponding to the respective site was explained as per **Annexure II**. In the context of pending grant of FTC, it was mentioned that as per Grid-India only two Wind Projects of JSW Renew Energy Ld. at Tuticorin-II with total quantum of 29.7 MW were under process as on date.

4. Chairperson, CEA, sought the views of CTUIL and Grid-India on the subject issue and the same are outlined hereunder:

4.1 Representatives of CTUIL mentioned that as per the prevalent IEC 61400-1 standard applicable for Wind Turbine classes, the temperature range for the extreme conditions is -20 °C to +50 °C and normal range for rated capacity operation is -10 °C to +40 °C. It was further expressed that the deliberations in the cited meetings of 30.05.2024 and 01.06.2024 gave the impression that the de-rated capacity of WTGs at 40°C of normal operating range shall be considered for quantum of connectivity. In this context, Chairperson, CEA, explained that the

issue is to be viewed in terms of the rated output of Wind Turbines as per the applicable IEC standard.

4.2 Representatives of Grid-India expressed their views on the subject issue as under:

(i) The Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007, as notified for the first time on 21st February, 2007, are applicable to all Users, Requesters, the Central Transmission Utility, and the State Transmission Utility. The Schedule Part I Clause 1(2) of the said Regulations provide as under:

> *"(2) The equipment including overhead lines and cables shall comply with the relevant Indian Standards, British Standard (BS) or International Electrotechnical Commission (IEC) Standard, or American National Standards Institute (ANSI) or any other equipment International Standard:*
>
> *Provided that whenever an International Standard or International Electrotechnical Commission Standard is followed, necessary corrections or modifications shall be made for nominal system frequency, nominal system voltage, ambient temperature, humidity and other conditions prevailing in India before actual adoption of the said Standard"*

Therefore, the cited Grid Connectivity Regulations mandate suitable modification of International Standards as per the Indian prevalent conditions which inter-alia include temperature also.

(ii) The temperature conditions for operation of Wind Turbines as specified in the applicable standard of IEC 61400-1, are reproduced below -

> ***"6.4.2 Normal other environmental conditions***
>
> *The normal other environmental condition values that shall be taken into account are the following:*
>
> - *Ambient temperature range of -10 °C to +40 °C*
>
> ***6.4.3 Extreme other environmental conditions***
>
> ***6.4.3.2 Temperature***
>
> *The extreme temperature range for the standard wind turbine classes shall be at least -20 °C to +50 °C"*

(iii) The rated output of Wind Turbine is defined as under in IEC 61400-1 is defined as:

> *"For a wind turbine, it is the maximum continuous electrical power output which a wind turbine is designed to achieve under normal operating and external conditions."*

Further, IEC 61400-1 also defines "Class S WTG" as under:

> *"A further wind turbine class, class S, is defined for use when special wind or other external conditions or a special safety class, see 5.3, are required by the designer and/or the customer. The design values for the wind turbine class S shall be chosen by the designer and specified in the design documentation. For such special designs, the values chosen for the design conditions shall reflect an environment at least as severe as is anticipated for the use of the wind turbine."*

Therefore, even for designing of the special "S Class" WTG, it is essential to consider the anticipated severe environmental conditions at site which include temperature as well.

(iv) It emerges from the above that under normal conditions, the maximum temperature for operation at rated capacity is 40°C, without de-rating. Further, the extreme temperature range for standard wind turbine classes should be from -20°C to +50°C. Thus, in compliance with IEC standards and CEA Grid Connectivity Regulations, the Project Developers must choose appropriate WTG models in conformity with the site conditions and the procedure specified by CEA in line with the recommendations in the Report of Working Group.

6. Based on the detailed deliberations and the submissions made by GRID-India & CTUIL, Chairperson, CEA, in consideration of the secured grid operation decided/instructed as under for grant of CON-4 and FTC approval to Wind Power Plants which are ready for commissioning:

(i) The Wind Power Plants with WTGs operating at rated output at 40°C and having no de-rating of capacity below 40°C, as compliant with normal operating range of IEC 61400-1 standard, need to be considered in determining the permissible quantum of connectivity. In case of WTGs de-rating before 40°C, opportunity will be given to the OEMs to modify the design of WTGs for delivering the rated output upto at least 40°C for consideration of connectivity.

(ii) The Wind Power Plants with WTG's giving rated output upto the normal operating range of 40 °C as per IEC 61400-1 standard, but operating at de-rated capacity at the stipulated extreme temperature of the site as per the CEA (Technical Standards for connectivity to the Grid) Regulations, shall be given connectivity corresponding to the de-rated capacity at the extreme temperature. In case there is no de-rating of WTGs upto the stipulated extreme temperature at site, the entire capacity of such WTGs would be considered in deciding the quantum of connectivity.

(iii) In case of Hybrid Plants, the available capacity of WTGs [as per (ii) above] and the output of Solar Inverters at the stipulated extreme temperature of the site as per the CEA (Technical Standards for connectivity to the Grid) Regulations, shall be considered in totality to determine the permissible quantum of connectivity. However, no separate stipulation is to be made for the permissible Wind and Solar Capacity in the total quantum of connectivity being allowed to the Hybrid Plants. The power injection from Hybrid Plants shall be scheduled upto the allowed quantum of connectivity irrespective of the source of generation (Wind or, Solar, or, Battery Storage).

The Meeting ended with a Vote of Thanks to the Chair.

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Annexure-I

List of the Participants in the Meeting held in CEA on 26/07/2024 at 11:00 AM

Central Electricity Authority (CEA)

1. Sh. Ghanshyam Prasad, Chairperson
2. Sh. Hemant Jain, Member (Grid Operation & Distribution)
3. Sh. B. Lyngkhoi, Chief Engineer (Grid Management)
4. Sh. O.P. Suman, Director (Grid Management)
5. Sh. Sandeep Kumar, Deputy Director (Grid Management)
6. Sh. Sakil Ahmed, Assistant Director (Grid Management)

GRID-India

1. Ms. S. Usha, CGM (I/C)
2. Sh. Abhijeet Prakash, Chief Manager

Central Transmission Utility of India Limited (CTUIL)

1. Sh. Ashok Pal, Dy. COO
2. Sh. Anil Kr. Meena, GM
3. Ms. Himanshi, Manager
4. Sh. Ajay Kumar, Asst. Manager

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Annexure-II

List of Wind Power Plants pending for CON-4 approval

S. No.	Name of Project Entity (Type of Project)	Name of OEM for WTGs and Solar Inverters	Quantum (MW) under CON-4 application and Name of Pooling Station (PS) for Connectivity (Extreme temperature of PS)	Status As on 25.07.2024
	SOUTHERN REGION			
1.	JSW Renew Energy Limited (Wind Project)	70 WTGs: Senvion & 30 WTGs: GE (each of 2.7MW)	270 MW at Karur PS (44^0C)	Senvion WTGs start derating after 45^0C while GE WTGs start derating after 40^0C.JSW Renew have changed OEM from GE to Senvion for 30 WTGs also.
2.	Zenataris Renewable Energy Pvt. Ltd. (Wind Project)	20 WTGs: Envision (each of 3.3 MW)	66 MW at Hiriyur PS (42^0C)	Initial design of WTGs indicated derating after 30^0C. However, WTG OEM (Envision) have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C.
3.	Kleio Solar Power Pvt. Ltd. (Hybrid Project – Wind & Solar)	29 WTGs: Vestas (each of 3.6 MW) and, 24 Inverters: Sungrow (each of 4.4 MW)	153.6 MW at Koppal PS (44^0C)	Vestas WTG V155-3.6 MW is class 'S' turbine, and OEM/designer can define parameters of wind turbine in 'S' class model. WTG is IEC 61400-1 Ed:2019 compliant. The WTG starts derating from 34^0C while the Solar Inverters give rated output upto 50^0C. The generation project is hybrid having 209.4 MW installed capacity (105 MW Solar & 104.4 MW Wind) against total connectivity of 153.6 MW. The derating of WTGs would be mitigated by the solar component.
4.	Serentica Renewable Energy 1 Pvt. Ltd. (Hybrid Project – Wind & Solar)	75 WTGs: SGRE (each of 3.6 MW) and, 64 Inverters: Sungrow (each of 3.3 MW)	285 MW at Gadag PS (43^0C)	SG-3.6-145 is class 'S' turbine and is certified in accordance with IEC 61400-1/A1, 2010 [1] and IECRE OD501 ed.2. Derating of WTG commences from 35^0C while the

S. No.	Name of Project Entity (Type of Project)	Name of OEM for WTGs and Solar Inverters	Quantum (MW) under CON-4 application and Name of Pooling Station (PS) for Connectivity (Extreme temperature of PS)	Status As on 25.07.2024
				Solar Inverters give rated output upto 50^0C. The generation project is hybrid having 470 MW installed capacity (200 MW Solar & 270 MW Wind) against total connectivity of 285 MW. Derating of WTGs would be mitigated by solar capacity and the project would be in position to deliver rated power in normal operating range of -10 to 40^0C.
5.	AM Green Energy Pvt. Ltd. (Hybrid Project – Wind & Solar)	46 WTGs: SGRE (each of 3.6 MW) 45 WTGs: Envision (each of 3.3 MW) and, 184 Inverters: Sineng (each of 3.3 MW)	921.3 MW at Kurnool PS (47^0C)	Derating of SGRE make WTG commences from 35^0C. Initial design of Envision WTGs indicated derating after 30^0C. However, WTG OEM (Envision) have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C. Solar Inverters will give rated output upto 50^0C.
6.	Renew Solar Power Private Limited (Wind Project)	91 WTGs: Envision (each of 3.3 MW)	300 MW at Gadag PS (43^0C)	Initial design of Envision WTGs indicated derating after 30^0C. However, WTG OEM (Envision) have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C.
	WESTERN REGION			
7.	ReNew Green (MHP One) Private Limited (Wind Project)	45 WTGs: Envision (each of 3.3 MW)	148.5 MW at Kallam PS (46^0C)	Initial design of Envision WTGs indicated derating after 30^0C. However, WTG OEM (Envision) have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C.
8.	Renew Solar Power Private Limited	91 WTGs: Envision (each of 3.3 MW)	300 MW at Kallam PS (46^0C)	Initial design of Envision WTGs indicated derating after 30^0C. However, WTG OEM (Envision)

S. No.	Name of Project Entity (Type of Project)	Name of OEM for WTGs and Solar Inverters	Quantum (MW) under CON-4 application and Name of Pooling Station (PS) for Connectivity (Extreme temperature of PS)	Status As on 25.07.2024
	(Wind Project)			have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C.
9.	Serentica Renewables India 4 Pvt Limited. (Wind Project)	106 WTGs: Envision (each of 3.3 MW)	350 MW at Kallam PS (46^0C)	Initial design of Envision WTGs indicated derating after 30^0C. However, WTG OEM (Envision) have modified the design and have submitted the revised de-rating curve along with clarification from certification body towards delivery of rated power upto 48^0C.
10.	TEQ Green Power Limited (Wind Project)	19 WTGs: Senvion (each of 2.7 MW) and, 36 WTGs: GE (each of 2.7 MW).	148.5 MW at Kallam PS (46^0C)	Both Senvion and GE make WTGs start derating after 40^0C.

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