फ़ैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009		Government of India Central Electricity Authority **Southern Regional Power Committee** Bengaluru - 560 009	
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सं/No. SRPC/SE-II/2017/		दिनांक / Date	10.10.2017

To: As per list enclosed

Sub: 4th RE/LVRT Meeting – reg.

The 3rd LVRT Meeting to ensure compliance of CERC order on Petition No.420/MP/2014 held on 05.07.2016 at Chennai (MoM available at SRPC website www.srpc.kar.nic.in).

It has been noted in the OCC meetings that RE issues require special focus and a separate meeting may be called. It is proposed to convene a meeting at **10:30 hrs of 25.10.2017 at SRPC, Bengaluru** to follow up compliance of Hon'ble CERC's Order/ other provisions of CEA/CERC Regulations and other RE issues. The agenda is enclosed.

It is kindly requested to make it convenient to attend the meeting.

धन्यवाद /Thanking you,

भवदीय / Yours faithfully

(असित सिंह / Asit Singh)
अधीक्षक अभियंता / Superintending Engineer

Mailing list

1. Chief Engineer (GO), APTRANSCO, Vijayawada
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3. Chief Engineer (Elec.), Load Despatch Centre, KPTCL, Bengaluru
4. Chief Engineer (System Operation), KSEBL, Kalamassery
5. Chief Engineer (Operation), TANTRANSCO, Chennai
6. Chief Engineer (NCES), TANGEDCO, Chennai
7. Superintending Engineer-I, Electricity Department, Puducherry
8. Chairman, Indian Wind Turbine Manufacturers Association, Chennai
9. Chairman, Indian Wind Power Association, Coimbatore
10. General Manager, SRLDC, Bengaluru
11. Director General, NIWE, Chennai

Agenda

1 Compliance of Order of Hon'ble CERC in Petition No. 420/MP/2014 – in respect of LVRT and other provisions of CEA/CERC Regulations

1.1 LVRT requirement for WTGs

- *LVRT should be implemented for all wind turbines (>& = 500 kW) commissioned before 15.4.2014 and connected to voltage level of 66 kV and above except for Stall Type WTGs, which are not technically feasible to be retrofitted with LVRT.*
- *In case of wind turbines of less than 500 kW and installed before 15.04.2014(except stall types), CEA is directed to conduct a study regarding technical feasibility of installation of LVRT in these turbines and submit a report to the Commission within 6 months of issue of this order.*
- *After the issue of necessary regulations/clarification by CEA with regard to the voltage level above which LVRT would be mandatory, the same requirement shall be applicable even in case of WTGs installed prior to 15.4.2014 keeping in view the safety and security of the grid.*
- *It is however clarified that WTGs whose useful life is going to expire in the next 5 years, shall be exempted from installation of LVRT.*

➢ All SLDCs had agreed to furnish the complete details in the formats finalized.

1.2 LVRT requirement for Solar Generating Stations

- *The provision of LVRT mandatory for all solar generators connected at the voltage level of 11 kV and above.*
- *Therefore, we direct that the solar generators whose bidding process has not yet commenced i.e. NIT has not yet been issued on date of this order shall take necessary steps to implement LVRT in their generating stations.*

➢ All SLDCs to confirm that the above is being complied.
➢ All SLDCs had been requested to emphasize implementation of LVRT & HVRT for solar generators and collect confirmation from RE developers before commencement of trial operation

1.3 Commercial mechanism for offsetting cost of LVRT installation if it is technically viable

- *We direct that the Stall Type WTGs existing prior to 15.4.2014 shall be allowed to operate in the Grid till their useful life.*
- *We request all the State Electricity Regulatory Commissions to make suitable provisions in their relevant regulations or through orders to provide for mandatory installation of LVRT in WTGs which fall within their jurisdiction.*
- *We direct all WTGs of capacity equal to or more than 500 KW except 'Stall Type WTGs' to comply with LVRT within two years in terms of our directions in para 29 of this order. Retrofitting WTGs with LVRT feature is a new requirement which did not exist at the time of bidding and may be considered under 'Change in Law'.*
- *State Electricity Regulatory Commissions are requested to consider allowing the cost of retrofitting WTGs with LVRT under the provision of 'Change in Law' in the respective PPAs.*

- *We direct wind mill owners, which are selling power through open access/banking, to factor the capital expenditure incurred by them for retrofitting WTGs with LVRT feature while quoting price of electricity for sale through open access/banking. In case the estimated cost of installing LVRT is substantially higher as compared to the capital investment in the turbine, RPCs may make a proposal for arrangement of funding from PSDF/NCEF/Green Fund for retrofitting WTGs with LVRT.*

➢ IWTMA had informed that total cost of retrofitting of LVRTs for the WTGs (commissioned before 15.04.2014) was expected to be around Rs 3,000 crores for turbines under OA/Captives throughout India. Additionally around Rs 40 crores would be required for certification by Accrediting Agency. Time period for retrofitting of Turbines could be 3 years. It would take 2 years for getting the turbine certified. IWTMA stated that LVRT was not a universal component and was tailor made for Turbines and therefore it was taking longer time frame. Accrediting Agency would take longer time for certifying LVRT to the existing certified Turbines since OEM would be dependent on the original certified Agency only.

➢ It was noted that any internationally accredited type certification body (whose accreditation includes CEA notification) can carry out evaluation of the documentation and issue type certificate or statement of compliance as the case may be.

➢ SRPC/SRLDC had suggested IWTMA to furnish the details state-wise (under PPA/OA/banking) for Southern Region. IWPA/ IWTMA/ Wind developers were suggested to take up with SERC / RE consumers as envisaged in the Order. Subsequently after taking up with SERC/RE consumers, IWPA/ IWTMA/ Wind developers could furnish details for the WTGs which would require PSDF/NCEF/Green Fund for retrofitting WTGs with LVRT. IWPA / IWTMA / Wind developers mentioned that breakup details with respect to individual WTGs could be prepared and updated in the data base being consolidated by the SLDCs. However, for taking up with SERC and for revision of PPA rates, support of SLDCs and FOR was requested.

- *In respect of WTGs, which have completed their useful life as on date of this order and those which are likely to complete their useful life in next two years should not be retrofitted with LVRT under PSDF/NCEF and should be taken out of service.*
- *With regard to monitoring of the installation and performance of LVRT installed on existing WTGs, we direct SLDCs to prepare quarterly reports and submit it to RPCs. RPCs are directed to validate the reports submitted by SLDCs in consultation with RLDCs and report any deficiency and non-compliance to the Commission in accordance with law.*

➢ It was suggested that Self declaration of the LVRT (along-with set points) and other provisions meeting requirement of CEA standards could be accepted with the provision that Certificate of Compliance/Type Test as part of Turbine Test Certification would be furnished by 04.01.2018.

➢ PMU installation at wind and solar pooling station was required for analyzing the LVRT operation.

➢ SLDCs/STUs were requested strictly to ensure the WTGs which were commissioned after 15.04.2014 and new WTGs should have LVRT features (and complied to CEA/CERC Regulations) as envisaged in the Order.

➢ Mechanism / Procedure for testing / checking of LVRT, HVRT, machine status etc.

1.4 Type Certification should be made part of Turbine Test Certification in case of retrofitting

- *We are of the view that Type Test Certification for all WTGs as per applicable Standards should be made mandatory.*
- *The modalities for carrying out Type Test Certifications including timeline for completing the process for certification, cost sharing, etc., shall be finalized by the respective RPC in consultation with CEA.*

➢ Regarding cost implications of Type Test Certification it was clarified that models being commissioned after 15.04.2014 need to carry out Type Test at their own cost since it was a regulatory requirement. This would validate the existing machines of the same model (same technology), generally as an industry practice one Type certificate is valid for 5-10 years.

➢ NIWE had informed that it had been agreed that NIWE would take up the issue of including the requirements of CEA Regulations in the scope by the 7 Accredited Type Test Certifications Bodies recognized in India. SRPC/SRLDC had requested NIWE to take up the issue at the earliest.

➢ On a query, NIWE had informed that there were 59 models (6 added and one deleted) in the RLMM approved list. LVRT and harmonics requirement were being considered on self certification.

➢ It was pointed out that new models need to have Certificate of Compliance on LVRT etc., and should not be included with self-certification. Keeping in view, the limited Accredited Type Test Certifications Bodies (majority not covering CEA Regulations in their scope) and other Testing Bodies, it was agreed that Certificate of Compliance from the third party agency was required with a provision that Type Test as part of Turbine Test Certification would be ensured by 04.01.2018.

1.5 Data Acquisition System/ Real Time Data Availability of SCADA system as envisaged in the IEGC

- *We are of the view that the solar/wind generators are responsible to provide real time data to SLDCs. The State Electricity Regulatory Commissions are requested to make suitable provisions in their regulations and through orders to ensure that solar/wind generators provide real time data to SLDCs as per the provisions of Grid Code.*
- *SLDCs are directed to ensure availability of data in respect of real time data from their Data Acquisition Systems of solar/wind generators in SCADA systems to respective RLDCs as per the provisions of the Grid Code.*

State	SCADA availability as on 30th June-17 Mapped/IC	SCADA availability as informed in CEA's meeting held on 28th June 2017 Mapped/IC
AP	Wind: 3563.071/3713.071 MW Solar: 1800/1875 MW	Wind: 95.5% Solar: 96%
TS	Wind: 100.8/100.8 MW Solar: 1230.5/1726.986 MW	All 23 RE generators connected at & above 132 kV : 1044/1044 MW RE generators connected at 33 kV below : 323.24 (41 RE generators) / 756 MW (63 RE generators)
KA	Wind: 3600.03/3600.03 MW Solar: 1014.4/1014.4 MW	Wind: 3595.23/3595.23 MW Solar: 1086.4/1086.4 MW

KE	Wind: 16/59.275 MW Solar: 36/71.036 MW	Wind: 22/65.475 MW Solar: 36/71 MW Hydro: 87.5/194 MW
TN	Wind: 2500/7850 MW Solar: 648/1850 MW	Wind: 2105 (92 WEGs) MW

- Mode of communication channel, availability of redundant / reliable path, internet etc.

1.6 Renewable Energy generators are required to do proper forecasting and scheduling and demand estimation by SLDCs in compliance with Grid Code

- *All solar/wind generators to forecast/schedule their power as per applicable regulations.*
- *For intra-State solar/wind generators, we request the State Commissions to issue appropriate regulations/orders to align with the provisions of the Grid Code as quoted in this para.*

- Methodology and procedure adopted by RE generator for forecasting and scheduling.
- *Publishing/furnishing of RE forecast by SLDC and capacity building in this regard.*

1.7 Study of line loading in STU network and strict N-1 compliance by expediting Works under progress, particularly wind evacuation system

- *STUs to study line loading in their systems to ensure N-1 compliance and submit reports in this regard to CEA by 10.3.2016. CEA is directed to discuss the same in the next Standing Committee Meeting (SCM)*

- STUs had been requested to study line loadings and submit report to CEA.

1.8 Compliance of the Central Electricity Authority (Technical Standards for Grid Connectivity) (Amendment) Regulations, 2013 by new generating units being commissioned and getting connected to the grid

- *Therefore, all the wind generating stations are directed to comply with the provisions of CEA Technical Standards for Connectivity Regulations. We further direct CTU and STUs to make provisions in this regard in their Connection Agreements to ensure that wind energy generators comply with the provisions of CEA Technical Standards for Connectivity Regulations for grid connectivity before granting connectivity to the grid.*

- Details of data being collected and procedure being followed by individual state for permitting RE generator connectivity / commissioning.
  - Viz – MW, MVAR, weather parameters and LVRT / HVRT status
  - Viz – at generator level, at pooling station level, at aggregator level

1.9 Implementation of LVRT, CEA/CERC Regulations for all WTGs commissioned from 15.04.2014

- All SLDC/STUs had been requested to ensure that Regulators Provisions are being complied.

2 Draft second amendment in CEA (Technical Standards for connectivity to the Grid) Regulations

CEA had issued draft second amendment in CEA (Technical Standards for connectivity to the Grid) Regulations and comments had been sought till 31.01.2017. This amendment sought to introduce/review the following provisions in the existing regulations:

a) Introduction of Frequency range with provision to include frequency response by Wind & Solar power stations
b) Introduce applicability of LVRT to Solar Generating stations.
c) Change applicability of LVRT to Wind generating units/stations at all voltage levels in place of 66 kV level & above.
d) Introduction of HVRT facility in Solar & Wind Generating units/stations
e) Specifying Ramp Up & Ramp Down rates for Solar & Wind Generating units/stations
f) Introduction of Voltage Regulation services for Solar & Wind Generating stations
g) Introduction of Short Circuit Ratio (SCR) for Renewable generating units/stations
h) Review of Reactive Power control capability of Renewable generating units/station
i) Review of limits of Harmonics
j) Review of limits of introduction of a new technology
k) Compliance Monitoring of CEA Regulations

- The final amendment was awaited. This is for kind information.
- Storage mechanism planned, if any, for mitigating issues like cloud passing etc.

3 Reactive support from RE generator

In the OCC meetings, it was noted that reactive support from RE generator was essential to support the grid with reactive interchange as per SLDC/RLDC requirements/directions. CEA (Technical Standards for connectivity to the grid) Amendment Regulations, 2013 states

B. Connectivity Standards applicable to the Wind generating stations and generating *stations using inverters*

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B2(1) The generating station shall be capable of supplying dynamically varying reactive power support so as to maintain power factor within the limits of 0.95 lagging to 0.95 leading.

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Reactive support from RE as per directions of SLDC/RLDC needs to enabled.

4 Local Control Room / REMC

- Arrangements for REMC project implementation
- Details of monitoring / control diagram required for REMC project
- Availability of local control room by major RE Developer. If available, contact details of the control room.

5 Other operational issues

- Implementation of contingency schemes for mitigating impact of sudden loss of RE generation.

- Action plan for managing shop ramp up /down for solar generation.
- Reporting of RE generation addition.
- Regulations notified at State level in respect of renewables.

6 Upcoming Renewable Projects and their integration with Transmission Network

Upcoming renewable projects and renewable evacuation schemes in Southern Region are given at Annexure. It was noted in the SRPC/TCC meetings that RE schemes are getting modified at times while some are getting dropped also. It was observed that timely progress on these schemes needs to be communicated to SRPC Secretariat, being a critical issue monitored by various bodies. RE Projects/evacuation schemes may kindly be reviewed and updated status may be furnished in the meeting.

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