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CIRCULAR

Subject: - Installation of Solar Energy System- guide lines issued - regarding

For the effective implementation of Kerala Solar Energy Policy, 2013 the following guide lines are issued.

A. **System** **Guidelines for scrutiny / inspection of Solar Energy**

1. The minimum requirement for the installation of solar energy system shall be a B- class contractor license. Depending up on the capacity of installation, eligible contractors can carry out the installation work.
2. Verify whether the inverter is grid tied or not.
3. Inverter capacity shall be selected based on the solar PV generation, so that maximum generation can be utilized.
4. Solar PV module details such as number of modules, wattage, number of cells, voltage, current etc. shall be verified.
5. It has to be verified whether PV module shall be MNRE approved or not. If MNRE approved, their certificate of approval shall be verified. Otherwise certificate from MNRE approved lab shall be obtained.
6. It shall be verified that harmonics are within specified limit for grid tied systems.
7. Solar inverter details and its specifications shall be verified.
8. If the system is grid tied, anti islanding protection shall be ensured- Certificate from the manufacturer shall be obtained.
9. Verify the cable sizes of solar PV system for adequacy.
10. It shall be ensured that energy meter is provided for recording the solar energy generated.
11. Bi directional meter (Net meter) shall be ensured at the interconnection point, if it is grid tied and export of power is required.
12. Solar panel supporting structures, inverter neutral, body etc. shall be earthed as per standards.
13. Adequate rating MCBs and surge protection device (SPD) shall be provided in the array junction box.
14. Ensure indicating meters in DC and AC DBs.
15. Battery and inverter shall be properly segregated with fire proof partition.
16. In the grid tied system, ensure that there is no feed back to the grid when grid supply is off.
17. If the proposed installation is having a DG set, ensure that DG set circuit is provided with a reverse power relay.
18. While issuing sanction for energisation, following conditions are to be included in addition to normal conditions.
 - a) Consent from licensee shall be obtained (In case of grid tied system).
 - b) Electricity duty for the units produced from the solar energy system should be remitted to the government.
 - c) The whole installation should be in conformity with Central Electricity Authority (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and Kerala State Electricity Regulatory Commission (Grid interactive distributed solar energy system) Regulation, 2014

B. Important extracts of Central Electricity Authority (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013(For information only)

- 5.11(1) Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519
- 5.11(2) The distributed generating resource shall not inject direct current greater than 0.5 % of the full rated output at the interconnection point
- 5.11(3) The distributed generating resource shall not introduce flicker beyond the limits specified in IEC 61000
- 7. The equipment of the generating station shall meet the following requirements.
 - (a) Circuit breakers or other interrupting equipment shall be suitable for their intended application with the capability of interrupting the max available fault current expected at their location.
 - (b) Distributed generation resource and associated equipment shall be designed so that the failure of any single device or component shall not potentially compromise the safety and reliability of the electricity system.
 - (c) Paralleling device of distributed generation resource shall be capable of withstanding 220 % of the nominal voltage at the interconnection point.
- 8. Every time the generating station is synchronised to the electricity system, it shall not cause voltage fluctuation greater than $\pm 5\%$ at the point of connection
- 9. Provide a manually operated isolating switch between the distributed generation resource and the electricity system which shall meet following requirements.
 - (a) Allow visible verification that separation has been accomplished.
 - (b) Include indicators to clearly show open and closed positions.
 - (c) Be capable of being reached quickly and conveniently 24 hrs a day by licensee's personnel without requiring clearance from the applicant.
 - (d) Be capable of being locked in the open position.
 - (e) May not be rated for load break nor may have features of over current protection
 - (f) Be located at a height of at least 2.44 m above the ground level

C. Important extracts of Kerala State Electricity Regulatory Commission (Grid interactive distributed solar energy system) Regulation, 2014 (For information only)

- 4(2)(c) The solar energy system installed by the consumer shall be connected with interlocking system and operated safely in parallel with the distribution system of the licensee.
- 4(3) Capacity of solar energy system- Minimum 1 kW to maximum 1 MW
- 8(b) The interconnection of the solar energy system with the distribution system of the licensee conforms to the relevant provisions of the CEA (MRS & ES) Regulation 2010
- 8(c) The net meter and solar meter installed conform to the standards, specifications and accuracy class as provided in the CEA(Installation & Operation of Meters) Regulation, 2006.
- 9(1) The net meter shall be installed at the interconnection point of the eligible consumer with the network of the distribution licensee.
- 9(2) Solar meter shall be installed at the delivery point of the solar energy system to measure the solar electricity generated.
- 9(4) The meters shall be tested, installed and sealed.
- 11 The eligible consumer shall comply with the specifications and standards and install grid - tied inverter, manually operated isolating switch and associated equipment with sufficient safe guards to prevent injection of electricity from his solar energy system to the distribution system of the licensee when the distribution system is de-energised.
- 13(12) The eligible consumer shall obtain from the Electrical Inspector necessary sanction for commissioning the solar energy system and produce the sanction to the distribution licensee.

D. Work distribution for the Scrutiny of Scheme and inspection of Solar Energy System.

1. For the installations upto and including 5kW, Completion report and single line diagram shall be obtained from the customer through a competent Electrical contractor.
2. For the installations upto and including 50kW, prior scheme approval and sanction for energisation shall be obtained from the District office.
3. For the installations above 50kW and upto and including 100kW prior scheme approval will be issued from the office of the Chief Electrical inspector and sanction for energisation shall be issued from the District office.
4. For the installations above 100kW prior scheme approval and sanction for energisation will be issued from the office of the Chief Electrical Inspector.
5. Installations upto and including 10kW shall be inspected by the Assistant Electrical Inspector.
6. Installations above 10kW and upto and including 50kW shall be inspected by the Deputy Electrical Inspector.
7. Installations above 50kW and upto and including 100kW shall be inspected by the Electrical Inspector or the Deputy Chief Electrical Inspector.
8. For the scrutiny and inspection the check list given in the annexure shall be followed.

Sd/-
Chief Electrical Inspector