

TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Wind and Solar Generation Sources) Regulations 2016.

Draft Notification No.TNERC/ABT/ dt. .1.2016

(Comments/suggestions are invited on or before 13.2.2016)

In exercise of the powers conferred under Section 181 of the Electricity Act, 2003 (36 of 2003), and all other powers enabling it in this behalf, and after previous publication, the Tamil Nadu Electricity Regulatory Commission hereby makes the following regulations, namely:

1. Short title and commencement:

(1) These regulations may be called the Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Wind and Solar Generation Sources) Regulations, 2016.

(2) These regulations shall come into force on the date of publication in the Tamil Nadu Government Gazette.

2. Definitions and Interpretation:

(1) In these regulations, unless the context otherwise requires,-

(a) 'Absolute Error' means the absolute value of the error in the actual generation of wind or solar generators with reference to the scheduled generation and the 'Available Capacity' (AvC), as calculated using the following formula for each 15 minute time block:

Error (%) = 100 X [Actual Generation–Scheduled Generation] / (AvC) ;

(b) 'Act' means the Electricity Act, 2003 (36 of 2003);

(c) 'actual drawal' in a time-block means electricity drawn by a buyer, measured by the interface meters;

(d) 'actual injection' in a time-block means electricity generated or supplied by the seller, as the case may be, measured by the Interface meters;

(e) 'Available Capacity or AvC' for wind or solar generators means the cumulative capacity rating of the wind turbines or solar inverters that are capable of generating power in a given time-block;

(d) 'beneficiary' means a person purchasing electricity generated from a generating station whose tariff is determined under the regulations of the Commission;

(e) 'buyer' means a person, including beneficiary, purchasing electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

(f) 'CERC' means the Central Electricity Regulatory Commission referred to in sub-section (1) of section 76 of the Act;

(g) 'Commission' means the Tamil Nadu Electricity Regulatory Commission established under sub-section (1) of Section 82 of the Act;

(h) 'deviation' in a time-block for a seller means its total actual injection minus its total scheduled generation and for a buyer means its total actual drawal minus its total scheduled drawal;

(i) 'gaming' in relation to these regulations, shall mean an intentional mis-declaration of available capacity or schedule by any seller in order to make an undue commercial gain through Charge for Deviations;

(j) 'Grid Code' means the Grid Code specified by the Commission under clause (h) of sub-section (1) of Section 86 of the Act;

(k) 'IEGC' means the Grid Code specified by CERC under clause (h) of sub-section (1) of Section 79 of the Act;

(l) 'interface meters' means interface meters as defined by the Central Electricity Authority under the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time;

(m) 'Pool Account' means state account for receipts and payments on account of deviation by buyers or sellers including wind and solar generators;

(n) 'pooling station' means the sub-station where pooling of generation of individual wind generators or solar generators is done for interfacing with the next higher voltage level:

Provided that where there is no separate pooling station for a wind / solar generator and the generating station is connected through common feeder and terminated at a sub-station of distribution licensee/STU/CTU, the sub-station of distribution licensee/STU/CTU shall be considered as the pooling station for such wind/solar generator, as the case may be;

(o) 'Qualified Coordinating Agency or QCA' means the agency coordinating on behalf of all or many of the Wind/Solar Generators connected to a pooling station. QCA may be one of the generators or any other mutually agreed agency for the following purposes on behalf of all the wind/solar generators represented by the QCA:

- Providing schedules with periodic revisions as per this regulation on behalf of the Wind/Solar Generators connected to the pooling station(s),
- Responsible for metering, data collection/transmission, communication, coordination with Distribution licensee, SLDC and other agencies;
- Undertake commercial settlement of all charges on behalf of the generators, including payments to the State pool accounts through the concerned SLDC;
- Undertake de-pooling of payments received on behalf of the generators from the State Pool account and settling them with the individual generators;
- Undertake commercial settlement of any other charges on behalf of the generators as may be mandated from time to time. QCA shall be treated as a State Entity.

(p) 'scheduled generation' at any time or for a time block or any period means schedule of generation in MW or MWh ex-bus given by the State Load Despatch Centre;

(q) 'scheduled drawal' at any time or for a time block or any period time block means schedule of despatch in MW or MWh ex-bus given by the State Load Despatch Centre;

(r) 'seller' means a person, including a generating station, supplying electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term open access;

(s) 'State Entity' means an entity which is in the SLDC control area and whose metering and energy accounting is done at the state level;

(t) 'State Load Despatch Centre' or 'SLDC' means Load Despatch Centre of the State, established under sub-section (1) of Section 31 of the Act, responsible for coordinating scheduling of the state entities in accordance with the provisions of the State Grid Code;

(u) 'time-block' means a time block of 15 minutes, for which specified electrical parameters and quantities are recorded by special energy meter, with first time block starting at 00.00 hrs;

(2) Save as aforesaid and unless the context or the subject matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Grid Code or any other regulations of this Commission shall have the meaning assigned to them respectively in the Act or the Grid Code or any other regulation.

3. GENERAL:

3.1 Objective:

The objective of these regulations is to facilitate large-scale grid integration of wind and solar generating stations while maintaining grid stability and security as envisaged under the Grid Code, through forecasting, scheduling and commercial mechanism for deviation settlement of these generators.

3.2 Applicability of the Regulations:

3.2.1 These regulations shall apply to all wind and solar generators connected to the State grid, including those connected via pooling stations, and selling power within the State.

4. FORECASTING AND SCHEDULING CODE:

4.1. This code provides methodology for day-ahead scheduling of wind and solar energy generators which are connected to the State grid and re-scheduling them on one and half hourly basis, and the methodology of handling deviations of such wind and solar energy generators. Appropriate meters shall be provided for energy accounting. Telemetry/communication system & Data Acquisition System shall also be provided for transfer of information to the SLDC.

4.2. Wind and Solar generators, independently or represented via Qualified Coordinating Agencies (QCAs), shall mandatorily provide to the SLDC, in a format as prescribed by SLDC, the technical specifications at the beginning and whenever there is any change. The data relating to power system output & parameters and weather related data as applicable shall also be mandatorily provided by such generators to the SLDC in real time.

4.3. Forecasting shall be done by wind and solar generators connected to the State grid, or by QCAs on their behalf. The SLDC is also mandated to undertake forecasting of wind and solar power that is expected to be injected into the State grid, by engaging forecasting agency(ies) if required. The forecast by the SLDC shall be with the objective of ensuring secure grid operation by planning for the requisite balancing resources. The forecast by the QCA or wind and solar generator, as the case may be, shall be generator centric. The QCA or wind and

solar generators will have the option of accepting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on their own forecast. The QCA shall coordinate the aggregation of schedules of all generators represented by them connected to a pooling station and communicate it to the SLDC.

4.4. The QCA or the wind and solar generator shall submit a day-ahead and week-ahead schedule for each pooling station or each generating station, as the case may be. Day-ahead schedule shall contain wind or solar energy generation schedule at intervals of 15 minutes (time-block) for the next day, starting from 00:00 hours of the day, and prepared for all 96 time-blocks. Week-ahead schedule shall contain the same information for the next seven days.

4.5. The schedule of wind and solar generators connected to the State grid (excluding collective transactions) may be revised by giving advance notice to the SLDC. Such revisions shall be effective from the 4th time block, the first being the time-block in which notice was given. There may be one revision for each time slot of one and half hours starting from 00:00 hours of a particular day subject to maximum of 16 revisions during the day.

4.6. The plan for data telemetry, formats of forecast submission and other details in this regard shall be provided in the Detailed Procedure to be prepared by SLDC.

4.7. Any commercial impact on account of deviation from schedule based on the forecast shall be borne by the wind and solar generator, either directly or transacted via the representing QCA.

5. COMMERCIAL AND DEVIATION SETTLEMENT :

5.1. The wind or solar generators connected to the State grid and selling power within the State shall be paid by the buyer as per actual generation.

5.2. The wind and solar generator or the QCA, as the case may be, shall have the option of accepting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast, and such schedule shall be used as reference for deviation settlement.

5.3. The QCA shall undertake all commercial settlement on behalf of the generator(s) connected to the respective pooling station(s).

5.4. In the event of actual generation of a generating station or a pooling station, as the case may be, being less or more than the scheduled generation, the deviation charges for shortfall or excess generation shall be payable by the wind and solar generator or the QCA, as the case may be, to the State DSM Pool, as given in Table 1 and Table 2 below:

Table 1 : Deviation Charges in case of under or over-injection by wind generators, for sale of power within the State.

Sl.No.	Absolute Error in the 15-minute time block	Deviation Charges payable to State DSM Pool
1.	< = 10%	None
2.	>10% but <=20%	At Rs. 0.50 per unit for the shortfall or excess energy for absolute error beyond 10% and upto 20%.
3.	>20% but <=30%	At Rs. 0.50 per unit for the shortfall or excess energy beyond 10% and upto 20% + Rs. 1.0 per unit for balance energy beyond 20% and upto 30% .

4.	> 30%	At Rs. 0.50 per unit for the shortfall or excess energy beyond 10% and upto 20% + Rs. 1.0 per unit for shortfall or excess energy beyond 20% and upto 30% + Rs. 1.50 per unit for balance energy beyond 30%.
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Table 2 : Deviation Charges in case of under or over-injection by solar generators, for sale of power within the State.

Sl.No.	Absolute Error in the 15-minute time block	Deviation Charges payable to State DSM Pool
1.	< = 5%	None
2.	>5% but <=15%	At Rs. 0.50 per unit for the shortfall or excess energy for absolute error beyond 5% and upto 15%.
3.	>15% but <=25%	At Rs. 0.50 per unit for the shortfall or excess energy beyond 5% and upto 15% + Rs. 1.0 per unit for balance energy beyond 15% and upto 25%.
4.	> 25%	At Rs. 0.50 per unit for the shortfall or excess energy beyond 5% and upto 15% + Rs. 1.0 per unit for shortfall or excess energy beyond 15% and upto 25% + Rs. 1.50 per unit for balance energy beyond 25%.

5.5. The QCA shall also de-pool the energy deviations as well as deviation charges to each generator using one of the following options:

- (a) In proportion to actual generated units for each time-block for each generator
- (b) In proportion to available capacity of each generator

5.6 The State shall maintain separate records and account of time-block wise schedules, actual generation and deviations for all generators, including wind and solar generators.

6. MISCELLANEOUS:

6.1 Power to Relax :

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected by grant of relaxation, may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.

6.2 Power to issue directions:

If any difficulty arises in giving effect to these regulations, the Commission may on its own motion or on an application filed by any affected party, issue such directions as may be considered necessary in furtherance of the objective and purpose of these regulations.

(By order of the Tamil Nadu Electricity Regulatory Commission)

-sd/-
(S.Chinnarajalu)
Secretary

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Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2016.

Explanatory Statement

1. The installed capacity of wind power in Tamil Nadu is 7506 MW and solar capacity is 409 MW. Wind power in the State accounts to 32% of the country's installed capacity of wind. The installed capacity of solar generation is also bound to increase further.
2. The Central Electricity Regulation Commission has published the framework on Forecasting, Scheduling and Imbalance Handling for variable renewable energy sources (wind and solar) for regional entities on 7.8.2015 and has issued constituent amendments to the Indian Electricity Grid Code for scheduling of wind and solar and to the Deviation settlement mechanism regulations specifying settlement rates for deviations caused by the wind and solar generators, which is at variance of that applicable to other generators.
3. The existing wind and solar generating stations are directly connected to the State grid, and fall under the operational control area of the SLDC. To facilitate large scale integration of solar and wind generating stations, and to maintain grid stability and security, Commission has framed regulations for forecasting, scheduling and for implementation of commercial mechanism for deviation settlement of these generators.

(By order of the Tamil Nadu Electricity Regulatory Commission)

-sd/-
(S.Chinnarajalu)
Secretary