Procedure for Forecasting, Scheduling and Deviation Settlement of Wind and Solar Generation

In accordance with
Tamil Nadu Electricity Regulatory Commission
(Forecasting, Scheduling and Deviation settlement and Related Matters for Wind and Solar Generation) Regulations, 2019.

Prepared by

Tamil Nadu State Load Despatch Centre

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Note: All the Comments/suggestions may be sent to this email Id: tnsldcredsm@gmail.com on or before 11.06.2019

PROCEDURE FOR FORECASTING, SCHEDULING AND DEVIATION SETTLEMENT OF SOLAR AND WIND GENERATION

1. **OUTLINE:**

1.1. This Procedure is issued in accordance with the provisions of regulation 21(1) and various other provisions of Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and related matters for Wind and Solar Generation) Regulations, 2019 issued vide Notification No.TNERC/ F&S Wind &Solar/21-1 dt.01.03.2019. All entities shall abide by the provisions of these Regulations as amended from time to time.

1.2. This procedure may be called the "Procedure for implementation of Forecasting, Scheduling and Deviation Settlement of Wind and Solar Generation" or in short "FSDSM Implementation Procedure" and shall be read in conjunction with Indian Electricity Grid Code (IEGC), Tamil Nadu Electricity Grid Code (TNEGC), Intra State Open Access Regulations and subsequent amendments issued thereof.

1.3. This Procedure is in accordance with the various provisions of TNERC (Forecasting, Scheduling and Deviation Settlement and Related Matters for Wind and Solar Generation) Regulations, 2019 for Intra-State Transmission System, hereinafter referred as "FSDSM Regulation 2019". All applicants shall abide by the provisions of the Regulations.

1.4. **APPLICABILITY OF THE PROCEDURE:**

This procedure shall apply to all Wind and Solar Energy Generators (excluding Rooftop PV Solar power projects) in Tamil Nadu connected to the Intra-State Transmission System or Distribution System, including those connected through pooling sub-stations, and using the power generated for self-consumption or sale within or outside the State.;

Whenever the Commission notifies amendments to the Regulations, irrespective of any amendment issued to the procedure, the provisions in amendment shall be followed.

The TNERC Forecasting, Scheduling and Deviation Settlement and Related matters for Wind and Solar Regulations 2019 are in effect from 20.3.2019. The commercial settlement i.e levy and collection of deviation charges shall commence six months from the date of effect of the Regulations.

2. QUALIFIYING CRITERIA FOR THE QCA:

2.1. As per Regulation 6.1 of TNERC F&S Regulations, 2019, majority of Generators in terms of their installed capacity at Pooling Sub-Station shall appoint one amongst themselves or any other entity as QCA. The QCA should be a company incorporated in India under the Companies Act 1956/2013.

2.2. In case of appointment of entity other than Generator(s) at Pooling Sub-Station, the Generators shall consider following guiding principles for appointment of QCA. Adherence to these guiding principles for appointment of QCA would be in the interest of Generators and would facilitate smooth implementation of F&S framework in the state.

2.2.1. The QCA shall have the capabilities of Modeling wind energy generation potential on seasonal time scales with impact surfaces, a tool to visualize the wind energy generation potential in "Climate Space".

2.2.2. The QCA shall have the experience in the field of Wind/Solar Power forecasting and scheduling in different terrain and regions for minimum period of two (2) years including pilot project work with appropriate accuracy levels in forecasting. However, in case of the Wind Turbine Manufacturer or individual Wind/Solar generator is acting as QCA, the experience clause is not applicable.

2.2.3. The financial strength of the QCA must be such that it should be in a position to handle the risk of penalties due to deviation charges applicable to generator. Considering this, the Average Net Worth of the QCA for forecasting & scheduling services must be in positive amounting to at least Rs.2.75 Crores (Net worth = Share Capital + Reserve – Revaluation Reserve – Intangible Asset – Misc. Expenditure to the extent not written off – Carried Forward Losses –

Liabilities) in the current financial year which should reflect from its audited balance sheet or CA's certificate.

2.2.4. QCA should have established team of:

a. Renewable resource analyst,
b. Modeling statisticians,
c. Energy model,
d. Software developers
e. 24 x 7 operation and monitoring team,

The corresponding supporting certificates/documents justifying qualification should be submitted along with the application for registration.

2.3. It is envisaged that Generators acting as QCA themselves, shall also strive to build requisite skillsets, capacity and technical competence adhering to qualification requirements over the period of two years.

2.4. The QCA shall possess/provide authorization as per Annexure - I from majority of the Generators connected in the Pooling Sub-station in terms of their combined installed capacity for appointment as QCA. (Not applicable if Generator is connected through dedicated inter-connection facility with the Grid) at the time of Registration.

2.5. QCA shall be regulated by the Regulations issued by CERC, TNERC and CEA from time to time.

3. ROLES AND RESPONSIBILITIES OF THE QCA:

3.1. In accordance with these Procedures and Regulations, the QCA shall be the State Entity.

3.2. The QCA shall be the single point of contact between the TNSLDC and the Generators to whom it is representing in the Pooling Sub-station.

3.3. The QCA shall establish a Control Center round the clock and shall have complete control over Wind/Solar injection feeders connected to Pooling Sub-stations. The Control Centre shall have facilities of voice communication with TNSLDC and Wind/Solar Generators with voice recording facilities, Fax machine and internet connection

available for all the 24 hours. The QCA shall comply the instructions of the System Operator in normal condition as well as during emergencies, appropriate decisions taken by the System Operators in view of Grid security and safety.

3.4. The QCA shall have established alternate voice and data communication with TNSLDC.

3.5. The QCA shall establish protocol for communication with individual generators to implement the instructions of System Operators and TNSLDC.

3.6. In case of any curtailment planned and communicated by the TNSLDC due to line maintenance or other reasons in certain time blocks of a day, the QCA shall be responsible for curtailing the generation at site and amending the Schedule accordingly, failing which the TNSLDC shall revise the Schedule as required.

3.7. Declaration of Available Capacity of the Generating Station to TNSLDC to which it is representing.

3.8. Provide aggregated Day ahead & Week ahead forecast (based on their own forecast or on the forecast done by TNSLDC) and Schedule as per **Annexure - II** through a web-based application maintained by TNSLDC.

Provided that if the QCA is representing on behalf of the multiple Pooling Sub-stations, the Scheduling, Energy accounting and Deviation monitoring for each Pooling Sub-station of wind and/or solar power generation shall be undertaken separately.

3.9. QCA in coordination with Generator shall provide real time availability (at turbine/inverter level) and generation data (at Pooling Sub-station level) as per **Annexure – III**.

3.10. In case of non-availability of Real time data (at Turbine Level/inverter level), QCA in coordination with Generators shall maintain and provide time block wise generation data at (turbine and inverter level) and weather data on Weekly basis:

- For wind plants, at the turbine level:
  Average wind speed, Average power generation at 15-min time block level

- For solar plants, for all inverters* >= 1 MW:
  Average Solar Irradiation, Average power generation at 15-min time block level.

* *if a solar plant uses only smaller string inverters, then data may be provided at the plant level.*

3.11. Be Responsible for metering and data collection, transmission and co-ordination with RLDC, TNSLDC, STU, CTU, TANGEDCO (DISCOM) and other agencies as per IEGC and CERC/TNERC Regulations.

3.12. Undertake commercial settlement of all deviation-settlement charges as per applicable TNERC FSDSM Regulations.

3.13. Maintain records and accounts of the time block-wise Schedules, the actual generation injected and the deviations, for the Pooling Sub-station and the individual Generators separately.

3.14. Prepare deviation accounts on weekly basis as per regulation 16 of the Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulations, 2019.

3.15. QCA shall execute an agreement with TNSLDC wherein it is mentioned that QCA shall undertake all operational and commercial responsibilities on behalf of the Constituents as per the prevalent TNERC Regulations.

3.16. QCA shall use Automatic Meter Reading (AMR) technologies for transfer, analysis and processing of interface ABT meter data to TNSLDC in line with Metering/ AMR protocol and AMR/Metering Standards to be finalised by STU in accordance with provisions of Metering code and CEA Metering Regulations, as amended from time to time.

3.17. Perform commercial settlement beyond the connection point (De-pooling arrangement among each generator in the Pooling Sub-station) and technical coordination amongst the generators within the Pooling Sub-station and up to the connection point as the case may be.

3.18. Shall furnish Technical data of individual generators of Wind/Solar as per **Format-1.**

3.19. Shall furnish the PPA rates as per **Format – 2.**

3.20. The QCA, within seven (07) days, shall inform the details to TNSLDC in case there is any change in:

- The Generating Station (in case of individually connected generator),
- Pooling Sub-station
- Individual generators in the Pooling Sub-station
- Reduction in authorization from generators in a Pooling Sub-station below majority of generators in terms of the total installed Capacity of the Pooling Sub-station.

3.21. Keep TNSLDC indemnified at all times and shall undertake to indemnify, defend and save the TNSLDC harmless from any and all damages, losses including commercial losses due to forecasting error, claims and actions including those relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the transactions undertaken by the Generators. The QCA shall submit the indemnity bond (**Format – 3**) on Non-Judicial Stamp Paper of value notified from time to time by the State Government at the time of registration.

4. ROLES AND RESPONSIBILITIES OF GENERATORS:

4.1. The Generators in the Pooling Sub-station shall appoint QCA and give authorization as per **Annexure – I**, for registration of QCA at TNSLDC.

4.2. The Generator shall not appoint and authorize multiple QCAs for a particular Pooling Sub-station. In such case, the authorization provided by the Generator shall be treated as invalid & TNSLDC shall process the application of the QCA as per the provisions of this procedure and the decision of TNSLDC on registration of QCA shall be binding on such generator.

4.3. In case of non-consensus among the generators connected through a common Pooling Sub-Station feeder for appointment of QCA, then such generators shall take separate connectivity from STU/DISCOM

and furnish the schedules by appointing separate QCA in accordance with these regulations and procedure.

4.4. Once the QCA is registered, the generator/s shall not re-appoint another QCA, at least within two (2) years from the date of successful registration of the QCA at TNSLDC.

Provided that in case of defaults by the QCA, the generator/s can re-appoint another QCA by giving prior notice of three (3) months to TNSLDC and the process of registration of new QCA shall be carried in accordance with these regulations and procedures.

4.5. QCA shall be responsible for coordination with STU / Discoms / TNSLDC (TANGEDCO in the place of "DISCOM") for installation of Special Energy Meters (SEM) along with AMR facility (modem, antenna & SIM) and integration of SEM with AMR Server of TNSLDC for meter data downloading remotely at TNSLDC. In case of non-receipt of meter data through AMR system by TNSLDC, QCA shall coordinate with DISCOM/ STU for manual data downloading through CMRI and submit the same as decided by TNSLDC/ within 2 days from the date of intimation.

4.6. All the generators shall save and store the block-wise generator injection data or any other data desired by TNSLDC and make available the same to their respective QCA so that it could be sent to TNSLDC within (7) days from the date of demand from TNSLDC.

5. ROLES AND RESPONSIBILITIES OF TNSLDC:

5.1. TNSLDC shall provide a web-based portal for use by QCA with login and password facility for:

- Online registration/de-registration of QCA
- Uploading of Day ahead and Week ahead Generation Forecasts
- Uploading of the revisions in Schedules in accordance with these Procedures and Regulations.
- Communication of Grid Constraints and curtailments if any.

5.2. The TNSLDC shall be responsible for scheduling, communication, coordination with QCAs. Forecasting of the renewable energy generation shall be done by the TNSLDC and the forecast will be available on the website. The generation forecast shall be done on

the basis of the weather data provided by the Forecasting Agency. However, the forecast by the TNSLDC shall be with the objective of ensuring secure grid operation.

5.3. The TNSLDC shall maintain records and accounts of the time block-wise Schedules, the actual generation injected and the deviations, for the Pooling Sub-station and the individual Generators separately.

5.4. Maintain State Deviation Settlement Account for Wind and Solar Generations.

6. REGISTRATION AND DE-REGISTRATION PROCEDURE:

A. Registration as a Qualified Co-ordinating Agency (QCA):

6.1. The application for Registration as a Qualified Co-ordinating Agency (QCA) should be submitted online through TNSLDC's web-based Software.

6.2. The QCA shall submit separate application for each pooling sub-station. For each Pooling Sub-Station only one application shall be accepted from the QCA.

6.3. The application for Registration shall be made as per the application format for registration (**Annexure - IV**) and shall contain details such as,

- Location of the generation (Village, Taluka, District)
- Total Capacity of the Generation and inter-connection arrangement with InSTS.
- Authorization from majority of the Generators connected in the Pooling Sub-station in terms of their combined installed capacity for appointment as QCA. (Not applicable if Generator is connected through dedicated inter-connection facility with the Grid)
- Names along with individual installed capacity of generation of the constituents to whom QCA is representing
- Metering arrangements (ABT Meter with DLMS Compliance, Modem, Data Concentrator Unit (DCU) etc.,)

- Communication arrangements with TNSLDC for Real time Generation, Meter reading for accounting etc.

6.4. The Application for Registration shall be accompanied by a non-refundable processing fee of Rs. 20,000/- (Twenty Thousand Rupees Only) payable through NEFT or any other modes.

6.5. The scanned copies of the required documents shall be uploaded while submitting application.

6.6. Once the application is submitted, the print of online application with sign and seal along with required documents in original, shall be submitted to TNSLDC. Without receipt of the hard copy for verification purpose, TNSLDC shall not process the online application for registration.

6.7. The details of Nodal Officers from TNSLDC for processing applications for Registration and day to day activities towards forecasting, Scheduling and Revisions thereof shall be displayed on TNSLDC's website for smooth implementation of these procedures.

6.8. An incomplete Application, and/or an Application not found to be in conformity with these Procedures and Regulations, shall be rejected.

6.9. The time period for registration of QCA shall be (15) working days from the date of receipt of all the documents & information in complete to TNSLDC.

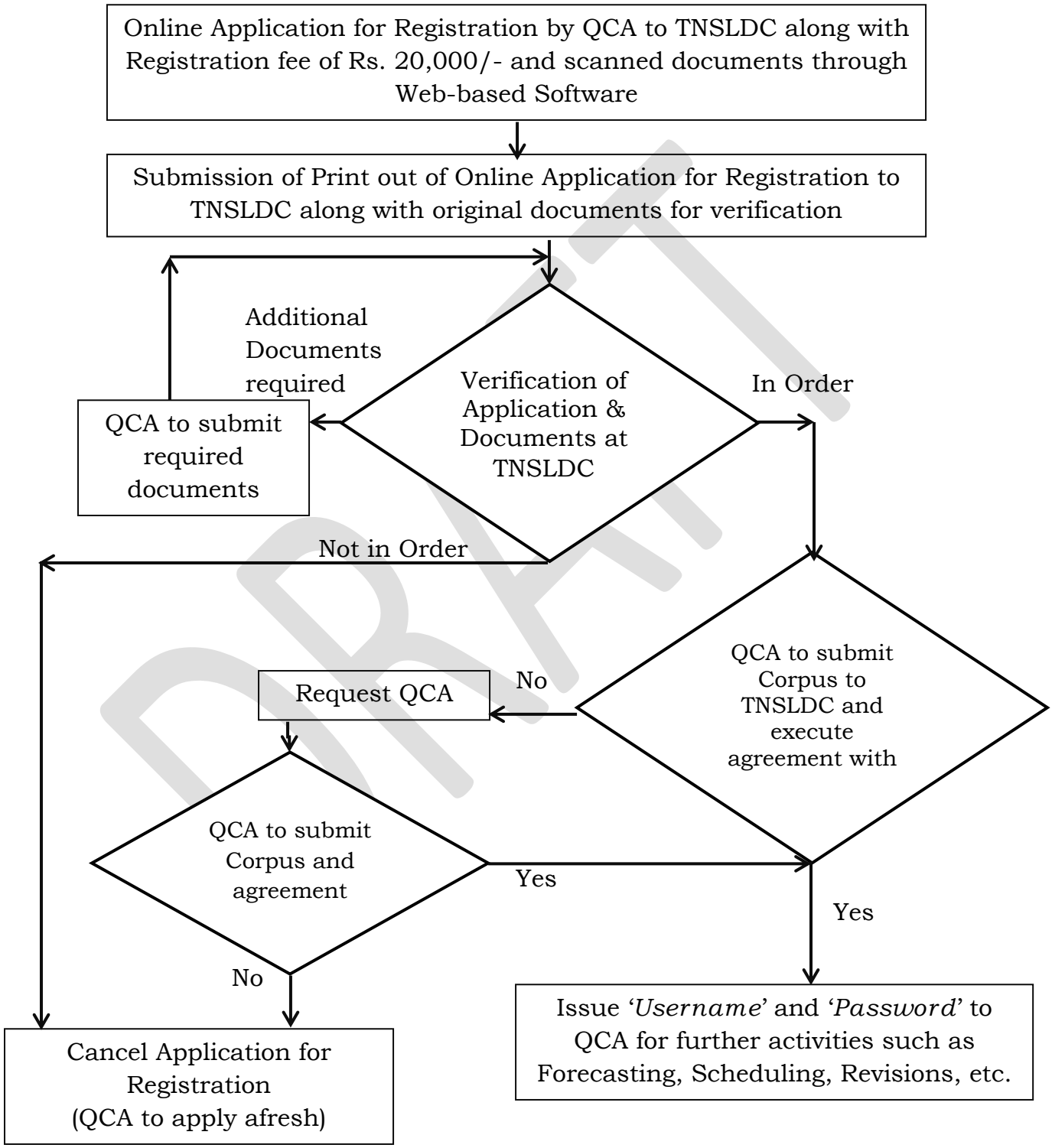
6.10. After verification of all the documents, the QCA shall execute an agreement with TNSLDC wherein it is mentioned that QCA shall undertake all operational and commercial responsibilities on behalf of the Constituents as per the prevalent TNERC Regulations.

6.11. At the time of execution of the agreement, the QCA shall provide payment security through an irrevocable Letter of credit to TNSLDC. The details of the same shall be in accordance with the Clause No. 13.7, of the said procedure.

6.12. Once the QCA executes agreement with TNSLDC and deposits Amount, TNSLDC shall register the QCA and issue a '***username***' and '***password***' for accessing the website for further activities such as uploading of day ahead / week ahead forecasts, revisions to existing schedules etc.

6.13. The above procedure is depicted below in the form of Flow chart for easy understanding.

Flow Chart for Registration of QCA



B. De-Registration as a Qualified Co-ordinating Agency (QCA):

Case - 1: Own De-registration:

6.14. The QCA may request TNSLDC for de-registration as QCA, however, in such case, it shall be the responsibility of the QCA to settle all the commercial obligations of both TNSLDC and Generators to whom it is representing.

6.15. Three (3) months prior notice to be served to all the generators to whom it is representing for de-registration with copy to TNSLDC.

6.16. The generator/s shall be responsible for appointing new QCA and ensure registration of new QCA at TNSLDC within this notice period, post which generation shall not be scheduled.

Case – 2: De-registration due to non-authorization of Generator:

6.17. Three (3) months prior notice to be served by the generator to the QCA for non-authorization with copy to TNSLDC, subject to Clause No. 4.4.

6.18. The generator/s shall be responsible for appointing new QCA and ensure registration of new QCA at TNSLDC within this notice period, post which generation shall not be scheduled.

6.19. Before de-registration, the generator shall ensure that all the commercial settlements pertaining to it has been completed by the QCA with TNSLDC.

Case – 3: De-registration under default condition:

6.20. The TNSLDC shall initiate the process of de-registration, if the condition as per Clause No. 3.20 is violated by the QCA.

6.21. The TNSLDC shall initiate the process of de-registration, in case of default conditions mentioned at Clause No. 14.1.

6.22. In such case, the process of de-registration shall be initiated as per Clause No. 14.2.

6.23. The generator/s shall be responsible for appointing new QCA and ensure registration of new QCA at TNSLDC within this notice period, post which generation shall not be scheduled.

7. TNSLDC FEES & CHARGES AND OTHER CHARGES:

7.1. TNSLDC fee and charges including scheduling and operating charges shall be payable by QCA as specified in the TNSLDC ARR approved by the Commission time to time. Scheduling charges shall be applicable per Pooling Sub-station. The other charges shall be levied as per the applicable TNERC Regulations/Orders.

8. COMMUNICATION MODE AND PROTOCOL:

8.1. SCADA from the turbine level to Pooling Sub-station in real time shall be provided up to the Pooling Sub-Station by QCA/Generators. The data from the Pooling Sub-station to TNSLDC shall be transmitted with IEC: 104 protocol along with communication without any interruption by QCA.

The requirements for data visibility and interfacing requirements at TNSLDC Chennai/REMC Chennai/Sub LDC Erode/ Sub LDC Madurai are as detailed below.

- The Remote Terminal Unit under the proposed scheme shall be capable of communication with LD Centres in IEC-104 Protocol.
- Communication media such as BSNL/MTNL leased circuit, MPLS, TATA Communication, Reliance Communication, VSAT etc. with latency less than 800ms may be used for data transmission. The typical bandwidth requirement for real-time point to point data inter-connection bandwidth of 64 kbps communication between Pooling Sub-station/ Generator (in case of individual generator) and TNSLDC and depends upon data volume.
- Wind/Solar Generators shall submit request letter along with Single Line Diagram of their plant area to TNSLDC for data points. TNSLDC will issue list of data points to be transmitted from Wind/Solar Generators station in real time mode.
- Wind/Solar Generators shall submit complete proposal along with schematic diagram for RTU installation and data communication with LD Centres with the above confirmations/clarifications for approval by this office.

- Integration of Wind/Solar Generators station data into the SCADA systems at TNSLDC Chennai/REMC Chennai/Sub LDC Erode/ Sub LDC Madurai on IEC 104 protocol.
- Completion of all above is under the scope and responsibility of Wind/Solar Generators Station.
- SCADA system provided at nearest substation of TANTRANSCO is only for the purpose of monitoring/control of Wind/Solar Generators data/ operations at local level and do not cover the scope of visibility of real-time data at TNSLDC Chennai/Sub LDC Erode/Sub LDC Madurai.
- Integration of Real time data from RTU of any make in IEC-104 Protocol is to be done in TNSLDC SCADA system. The work of integration will be carried out TANTRANSCO. In order to carry out integration work, the approved rates of integration to be paid by third party vendor. The rate for integration of one RTU in TNSLDC-SCADA system is Rs. 3.00 Lakhs/per RTU (Rs. Three Lakhs Only) plus GST at the rate 18 percent.

8.2. QCA shall be responsible for providing a redundant and reliable communication link between Pooling Sub-station and TNSLDC shall be made and maintained by the QCA.

9. FORECASTING AND SCHEDULING:

9.1. Forecasting of Wind/Solar injection on Pooling Sub-station basis shall be done by the TNSLDC for overall planning of resource requirements on day ahead basis in view of secure grid operation.

9.2. The QCA shall provide Pooling Sub-station wise forecasting for the Wind/Solar generators connected to Pooling Sub-station to TNSLDC based on their own forecast or may adopt forecast carried out by TNSLDC.

9.3. In the event of QCA adopting forecast provided by TNSLDC, charges amounting to Rs. 3,000/- per Pooling Sub-station per day, shall be paid by the QCA to TNSLDC. The consequences of any error in such forecast provided by TNSLDC which results in a deviation from scheduling shall be borne by the concerned Generators through

their QCA and QCA shall indemnify TNSLDC on account of the commercial impact.

9.4. The TNSLDC shall consolidate and forecast, based on various parameters and weather data obtained from any forecast service provider.

9.5. The submission of Pooling Sub-station wise day ahead forecast shall be in accordance with the time lines specified in Scheduling & Despatch Code.

9.6. The Pooling Sub-station wise day ahead forecast submitted by QCA shall be on 15 min time block basis in MW up to three decimal places. The fourth decimal place rounded off to third decimal place as per standard practice.

9.7. The QCA may revise Pooling Sub-station schedule in the TNSLDC Web-based Software for the current day;

Provided that, such revisions shall be effective from the forth (4^{th}) time block and *a maximum of sixteen (16) revisions during the day starting from 00.00 hours of a particular day.*

9.8. Process for submission of a day ahead Forecast for Intra-State Transactions is as follows:

		RE PSS Scheduling	
Activity No.	**Time in 24 Hours**	**Process**	**RE PSS**
		Configuration in Software	Available capacity, Contract quantum at the level of RE PSS.
1	10:00	Submission by QCA	PSS wise Available Capacity and Declared Capability.
2	10:15	Acknowledgement by Software	Software shall acknowledge the receipt of declared capabilities. Also software shall log and send warning to QCA who have not submitted.
3	18:30	Computation by Software	Dispatch Schedule
4	21:30	Submission of revisions by QCA	Revised Available capacity and declared capability
5	23:15	Computation by Software	Final Day ahead Dispatch Schedule of RE PSS
6	23:30	Issue of Final day ahead individual and consolidated dispatch schedules and drawal schedules after approval by TNSLDC (number of levels of approval shall be configurable. Generally it can be 0 to 2. By default it shall be 2).	

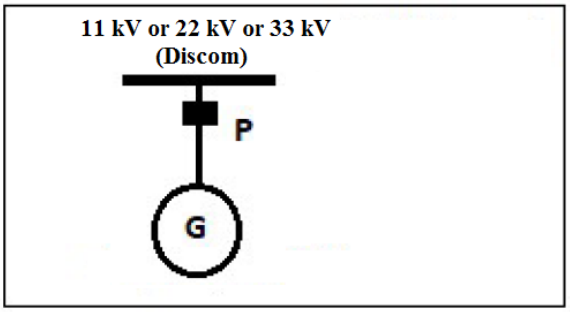
Note: No revision in Forecast shall be accepted after 21:30 Hrs.

9.9. The various cases indicating point of Forecast and Scheduling are as follows:

Inter-connection at Distribution Level:

Case – 1:

Single Generator or group of generators connected at 11 kV or 22 kV or 33 kV level of Discom's Pooling Sub-Station, selling power within the State:

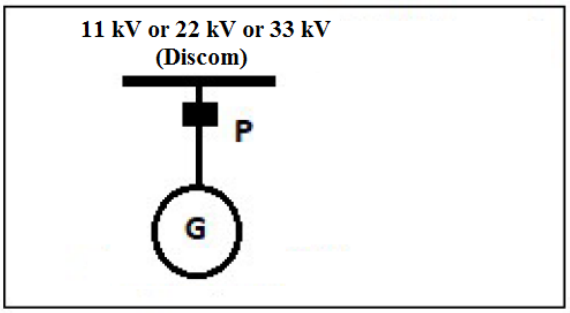


In this case, the Forecasting shall be provided by the QCA at Point 'P'. Scheduling and Accounting shall be done by TNSLDC at Point 'P'. The Distribution losses as approved by Hon'ble TNERC shall be applicable.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.

Case – 2:

Single Generator or group of generators connected at 11/22/33 kV level of Discom Pooling Sub-station, selling power outside the State:



In this case, the Forecasting shall be provided by the QCA at Point 'P'. Scheduling and Accounting shall be done by TNSLDC at Point 'P'.

The Distribution losses and Transmission losses up to State Periphery as approved by Hon'ble TNERC shall be applicable.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.

Case – 3:

Multiple Generators connected at 11 kV or 22 kV or 33 kV level of Discom's Pooling Sub-Station through dedicated feeder and selling power within and outside the State:

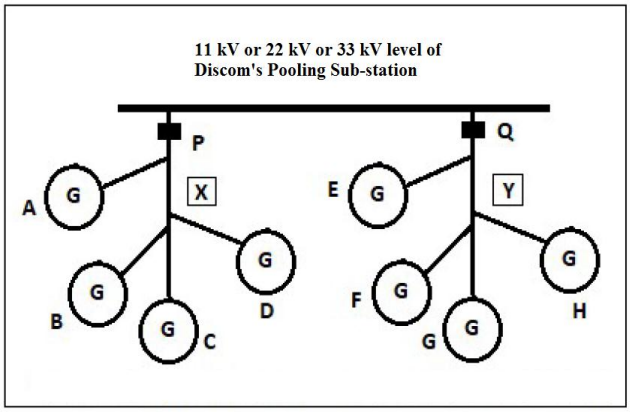
In such case, generators 'A' to 'D' are connected through a common & dedicated feeder 'X' having inter-connection point at 'P', selling power within the State.

Generators 'E' to 'H' are connected through a common & dedicated feeder 'Y' having inter-connection point at 'Q', selling power outside the State.

In such case, the QCA shall submit separate feeder-wise forecast at Point 'P' and 'Q' i.e. for Intra-State and Inter-State. TNSLDC shall Schedule at Point 'P' being Intra-State and at State Periphery for Point 'Q' by applying Transmission losses as approved by Hon'ble TNERC.

Further, in both the cases, Distribution losses as approved by Hon'ble TNERC shall be applicable.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.



Inter-connection at Transmission Level:

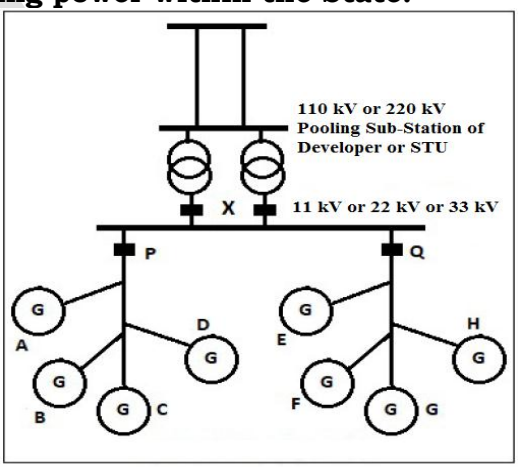
Case – 4:

Single Generator or group of generators connected at 11 kV or 22 kV or 33 kV level of EHV Pooling Sub-Station, selling power within the State:

In this case, a group of generators ('A' to 'H') are connected at 11/22/33 kV level of the EHV Pooling Station through common 11/22/33 kV feeders.

In such case, the Forecast shall be done by the QCA at Point 'X'. Scheduling and Accounting shall be done by TNSLDC at Point 'X'.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.



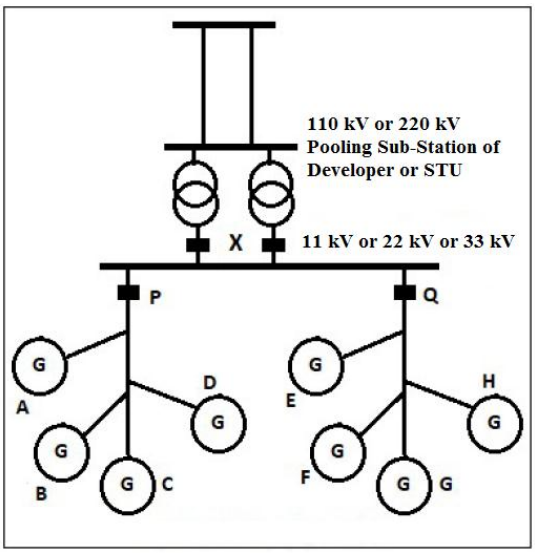
Case – 5:

Single Generator or group of generators connected at 11 kV or 22 kV or 33 kV level of EHV Pooling Sub-Station, selling power outside the State:

In this case, a group of generators ('A' to 'H') are connected at 11/22/33 kV level of the EHV Pooling Sub-Station through common 11/22/33 kV feeders.

In such case, the Forecast shall be done by the QCA at Point 'X'. Scheduling and Accounting shall be done by TNSLDC at State Periphery by applying Transmission Losses as approved by Hon'ble Commission as per Point 'X'.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.



Case – 6:

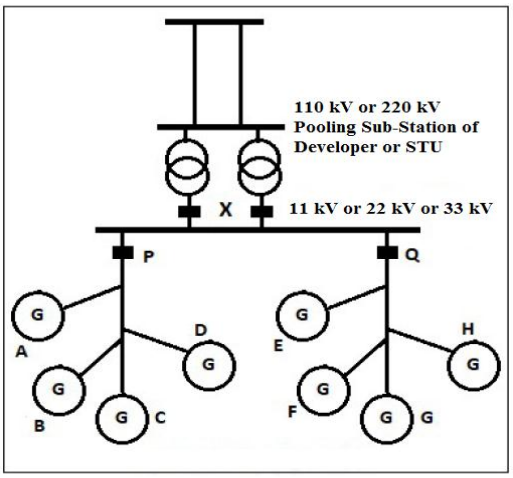
Multiple Generators connected at 11 kV or 22 kV or 33 kV level of EHV Pooling Sub-Station through dedicated feeder and selling power within and Outside the State:

In this case, multiple generators ('A' to 'D') are connected at 11/22/33 kV level of the EHV Pooling Station through common 11/22/33 kV feeders selling power within the State.

The Generators 'E' to 'H' are connected at 33 kV level of the EHV Pooling Sub-Station through common 33 kV feeders selling power outside the State.

In such case, the QCA shall submit separate feeder-wise forecast at Point 'P' and Q' i.e. for Intra-State and Inter-State respectively. TNSLDC shall Schedule at Point 'P' being Intra-State and at State Periphery for Point 'Q' by applying Transmission losses as by Hon'ble TNERC.

The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.



Case – 7:

Multiple Generators connected at 11/22/33 kV level of EHV Pooling Sub-Station or 33 kV Pooling Station of Discom, through dedicated feeder:

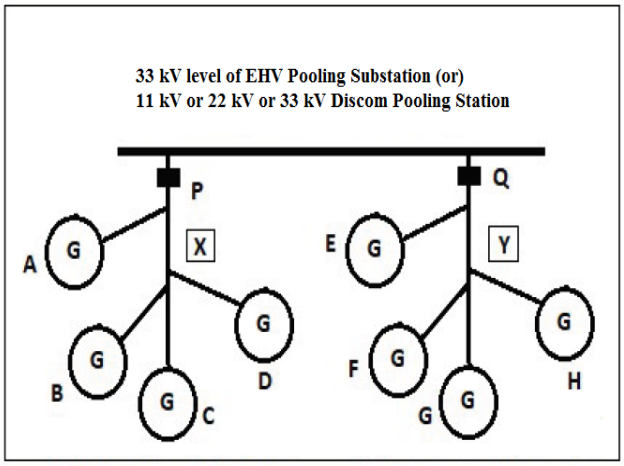
In this case, Generators 'A' to 'D' and 'E' to 'H' are connected to a Pooling Station of STU or Discom through separate & dedicated feeders having separate interconnection points at 'P' and 'Q' respectively.

In such case, there shall be only one QCA. The QCA shall submit consolidated Forecast for all the Generators for a Pooling Sub-Station and maintain separate forecast at Point 'P' & 'Q'.

TNSLDC shall carry out scheduling and accounting for Pooling Station as a whole and the QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.

However, in case of Intra and Inter-State transactions, separate feeder-wise forecast (for Intra & Inter-State) shall be submitted by the QCA.

In such case, TNSLDC shall separately schedule the power accordingly. For Inter-State schedules, Transmission Charges, as approved by Hon'ble TNERC shall be applicable. If the Pooling Station is of Discom, then Distribution losses as approved by Hon'ble TNERC shall be applicable.



10. ENERGY ACCOUNTING:

10.1. The energy accounting shall be undertaken on the basis of the data recorded by the Special Energy Meters (SEM) (ABT Meter with DLMS) provided at LV feeders (33/22/11 kV) at Pooling Sub-stations capable of recording the energy in 15-minute time blocks.

10.2. **By 00.00 hours on every Tuesday,** the QCA shall furnish weekly meter readings of Wind/Solar generators connected to Pooling Sub-station of the previous week starting from Monday 00:00 hrs to Sunday 24:00 Hrs, to the TNSLDC, in addition to the data provided to the Supervisory Data and Control Acquisition (SCADA) Centre, through the software developed for communication & data exchange with QCAs' for the purpose of energy accounting under these Regulations.

10.3. TNSLDC shall process the data provided by all the QCAs' and furnish processed data to respective QCA on **every Thursday mid-**

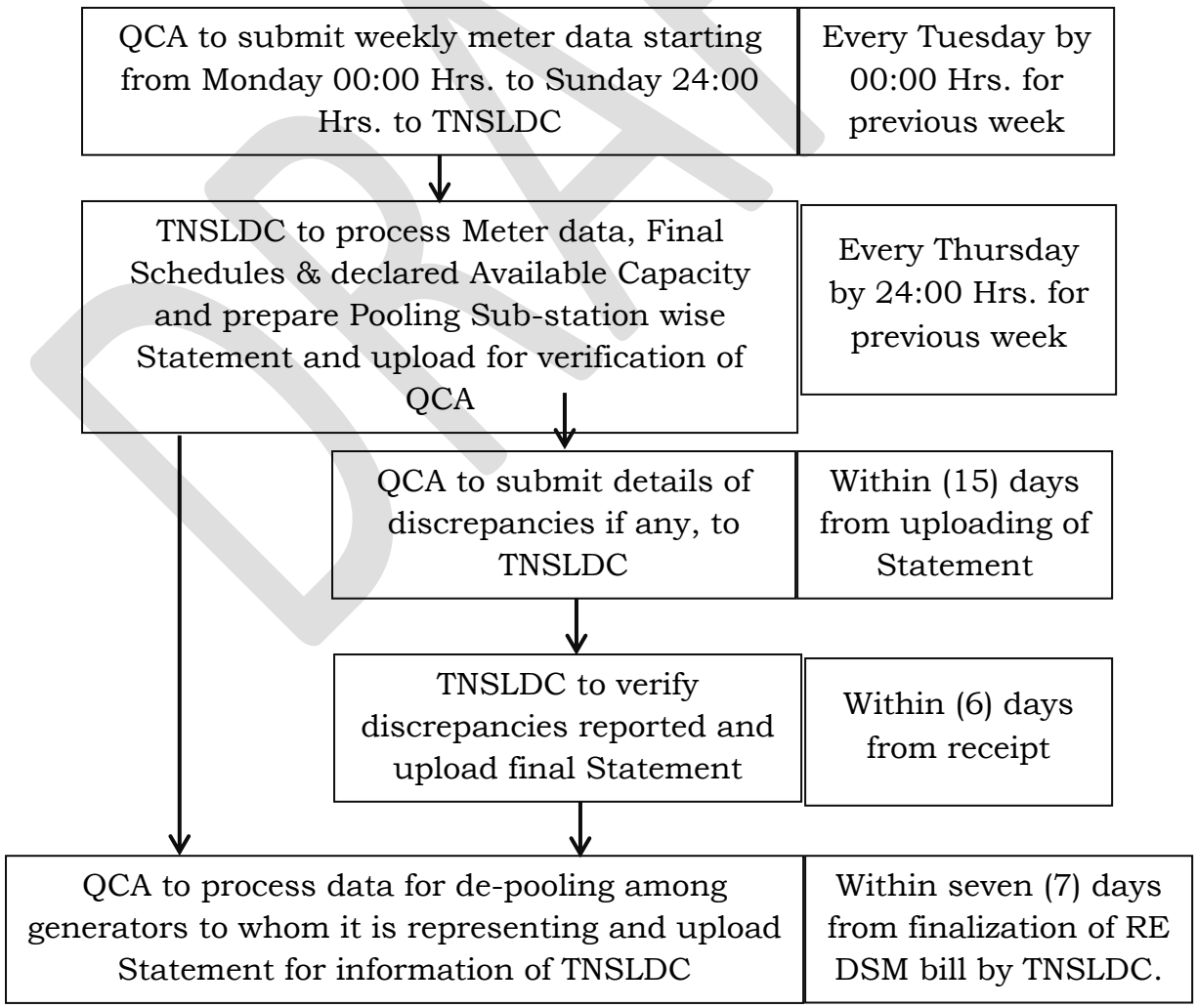
night (24:00 Hrs) for the previous week starting from Monday 00:00 hrs to Sunday 24:00 Hrs. for the preparation of weekly Energy Accounts by the QCA, for the Pooling Sub-station or the stand-alone Generator, as the case may be.

10.4. All accounts relating to de-pooling of deviations charges shall be prepared by the QCA on a weekly basis, based on Pooling Sub-station level inputs from the TNSLDC, and shall be accessible to the TNSLDC through an IT-enabled system and software.

10.5. The QCA shall communicate any discrepancies to TNSLDC within (15) days which shall be corrected forthwith by TNSLDC after due verification.

Any of the discrepancies reported after (15) days shall not be considered by TNSLDC and in such case, the Statement prepared by TNSLDC shall be final.

10.6. The process chart for Accounting is as below:



11. DEVIATION ACCOUNTING:

11.1. TNSLDC shall consider the deviation charges for the State as a whole at the periphery of the State as issued by SRPC weekly DSM bills.

11.2. TNSLDC shall determine the impact of deviation of Wind & Solar injection at Pooling Sub-station from schedule and its contribution on the total deviation charges at the State periphery as per SRPC weekly DSM bills.

11.3. TNSLDC shall compute the absolute error for each Pooling Sub-station and for Generators injecting Power individually, and shall calculate the deviation charges in accordance with the regulations.

11.4. TNSLDC shall compute the deviation charges and issue bills to the QCAs'.

11.5. Timelines for issuance & rectification of DSM Account and commercial settlement shall be as follows:

S.no	Action	Responsibility	timelines
1	Publish Weekly DSM Account on Website. The Account shall have day-wise, block-wise Deviation Charges, Schedule, Actual for each pooling station under QCA.	**TNSLDC**	Thursday of every week.
2	File comments / rectification requests.	**QCA**	Within 15 days from the date of publishing of the DSM Account on the website.
3	Carry out rectification / modifications of DSM account and convey the same through email / on website.	**TNSLDC**	Within 6 days after receiving the rectification request from QCA.
4	DSM Charges payable to Pool Account.	**QCA**	Within 10 days from the date of issue of DSM Account by

			TNSLDC.
5	If payments against the Charges for Deviation are delayed by more than two days, i.e., beyond twelve (12) days from the date of issue of the statement by the TNSLDC, the defaulting QCA shall have to pay simple interest@ 0.06% for each day of delay.	**QCA**	In case the payment is not made even after a lapse of 60 days from date of issuance of DSM Account. Process to invoke LC shall be initiated beside any other action as permissible under law / regulations.
6	DSM Charges receivable from Pool Account.	**TNSLDC or Agency maintaining the Pool Account**	Payment to QCA entitled to receive DSM Charges shall be made within 2 working days of receipt of payments in the State Deviation Pool Account. Provided that – a) In case of delay in the Payment of charges for Deviations into the State Deviation Pool Account and interest there on if any, beyond 12 days from the date of issue of the Statement of Charges for Deviations, the State Entities who have to receive payment for Deviation or interest thereon shall be paid from the balance available in the State Deviation Pool Account. In case the balance available is not sufficient to meet the payment

			to the State Entities, the payment from the State Deviation Pool Accounts shall be made on pro rata basis from the balance available in the Deviation Pool Account. b) The liability to pay interest for the delay in payments to the "State Deviation Pool Account" shall remain till interest is not paid; irrespective of the fact that constituents who have to receive payments, have been paid from the "State Deviation Pool Account" in part or full.

12. DEVIATION CHARGES METHODOLOGY:

12.1. All Pooling Sub-stations shall be classified in four categories i.e.

a. **Intra-State Pooling Sub-station**: where all wind & solar generators connecting through LV feeders are having delivery point within the State.

b. **Inter-State Pooling Sub-station**: where all the wind & Solar generators connecting through LV feeders are having delivery point outside the State.

c. **Mixed Pooling Sub-station**: where some of the feeders are having delivery point outside the State and balance within the State.

d. **Mixed Feeders Pooling Sub-station**: where some of the feeders are having both distribution load and RE generating stations.

12.2. **Methodology for Intra-State Transactions:**

12.2.1. Charges towards sale of Energy shall be settled by the Procurer on the basis of their actual generation, whereas the

charges towards deviation of Energy from its given schedule shall be settled by the QCA.

12.2.2. The charges towards deviation in case of actual generation are lower/more than scheduled generation (Under-Injection/Over-Injection) shall be in accordance with the TNERC FSDSM 2019 regulation.

12.2.3. The % error shall be calculated on the basis of available capacity and deviation as actual – schedule and % error shall be calculated by rounding up to second decimal place.

12.2.4. Illustrative example for calculation of deviation charges for five Pooling Sub-stations is as under in **Table - 2 & Table – 3** for both inter and intra-state transactions respectively.

12.2.5. The total deviation charges remitted on account of deviation by a wind/solar generator(s) through QCA into state deviation pool account (wind and solar) in a financial year shall be capped at the sealing rate of 5 paise per unit or such other rate as may be stipulated by the commission from time to time through separate order.

12.2.6. The total annual energy at the respective pooling substation for the financial year shall be calculated and multiplied with sealing rate as specified in the clause 12.2.5.

12.2.7. Any excess amount of deviation charges remitted beyond the capped amount over the financial year shall be refunded or credited in the account of concerned QCA and refunded to the generator(s) through respective QCA in the subsequent settlement period(s) at the end of financial year without interest.

Table – 2

Pooling Sub-station wise deviation charge calculation (for One Time block)						
Wind Pooling Sub-station No	**Available Capacity (kWh)**	**Schedule (kWh)**	**Actual Injection (kWh)**	**Deviation (KWh)**	**Inter Absolute Error (%)**	**Inter Dev. Charges payable by Individual Pooling Sub-stations (F)**
	(A)	**(B)**	**(C)**	**(D)**	**(E)**	
W.P.S.	**AvC**	**Sch.**	**Act. Inj.**	**Dev.**	**Dev.**	**Inter Deviation Charges (Rs.) ***
P.S. - 1	2500	2500	2300	-200	8	-829.64
P.S. - 2	2500	2500	2100	-400	16	-1721.50
P.S. - 3	2500	2500	1800	-700	28	-2538.69
P.S. - 4	2500	2500	1600	-900	36	-3384.93
P.S. - 5	2500	2500	2750	250	10	207.41
Grand Total	12500	12500	10550	ABS 2450	19.6	-8267.35
Net Exch. With Grid	**12500**	**12500**	**10550**	**-1950**		

Table – 3

Pooling Sub-station wise deviation charge calculation (for One Time block)						
Wind Pooling Sub-station No	**Available Capacity (kWh)**	**Schedule (kWh)**	**Actual Injection (kWh)**	**Deviation (KWh)**	**Intra Absolute Error (%)**	**Intra Dev. Charges payable by Individual Pooling Sub-stations (F)**
	(A)	**(B)**	**(C)**	**(D)**	**(E)**	
W.P.S.	**AvC**	**Sch.**	**Act. Inj.**	**Dev.**	**Dev.**	**Intra Deviation Charges (Rs.)***
P.S. - 1	2500	2500	2250	-250	10	0
P.S. - 2	2500	2500	2000	-500	20	125
P.S. - 3	2500	2500	1750	-750	30	375
P.S. - 4	2500	2500	1500	-1000	40	750
P.S. - 5	2500	2500	2750	250	10	0
Grand Total	12500	12500	10250	ABS 2750	22	1250
Net Exch. With Grid	**12500**	**12500**	**10250**	**-2250**		

Note:

* Negative sign indicates the charges payable to deviation pool account

Positive sign indicates the charges receivable from deviation pool account

12.3. **Methodology for Inter-State Transactions:**

12.3.1. Inter-State transactions at a Pooling Sub-station shall be permitted only if the concerned Generator or group of generators is connected through a separate feeder.

12.3.2. The Generator(s), through the QCA, shall submit a separate Schedule for its energy injection at Pooling Sub-station, in accordance with these Regulations, to the TNSLDC.

12.3.3. The Inter-State Schedule submitted by the QCA shall be grossed-up to State Periphery by applicable transmission losses.

12.3.4. The TNSLDC shall prepare the deviation settlement account for such Generator on the basis of measurement of the deviation in the energy injected as per regulation 8 of "TNERC FSDSM 2019 regulation".

12.3.5. The rate for deviation settlement shall be based on the highest marginal cost of power for the day or frequency linked deviation charges of the corresponding time block whichever is higher.

12.3.6. The QCA shall pay the Deviation Charges prepared by TNSLDC to the State Deviation Pool Account (Wind and Solar).

12.3.7. The Deviation Charges for actual injection is lower/higher than the scheduled generation (Under-Injection/Over-Injection) by Generators selling or consuming power **outside Tamil Nadu** shall be in accordance with "TNERC FSDSM 2019 regulation".

12.3.8. Deviations in respect of Inter-State and Intra-State transactions shall be accounted separately at each Pooling Sub-station.

12.3.9. The TNSLDC shall provide separate DSM accounts for Inter-State and Intra-State transactions to the QCA, who shall settle the Deviation Charges with the concerned Generators.

13. DEVIATION CHARGES PAYMENT MECHANISM:

13.1. The QCA shall open Bank Account in any Nationalized Bank and intimate the details of the same to TNSLDC.

13.2. The Deviation Charges shall be paid by the QCA within ten (10) days from the issue of the accounts and billing by the TNSLDC.

13.3. If payments of the above deviation charges are delayed by more than 2 days i.e. beyond 12 days from the date of issue of statement, a simple interest of 0.06% for each day of delay shall be levied. This is without prejudice to any action that may be taken under Section 142 of the Act in addition to any action under Section 56 of the Act and other relevant Regulations.

13.4. The responsibility of ensuring the payment of the Deviation Charges to the TNSLDC by the QCA shall remain to that of the concerned Generators.

13.5. After successful registration of the QCA, it shall be the responsibility of the QCA to provide payment security through an irrevocable Letter of credit (LC) which shall needs to be maintained as per Clause no. 13.6.

13.6. The LC amount shall be the interest free amount equivalent to Rs.25,000/- (Twenty Five Thousand Rupees only) per MW for Solar Generation and Rs. 50,000/- (Fifty Thousand Rupees only) per MW for Wind Generation.

13.7. If the QCA fails to pay deviation charges within sixty (60) days from the issue of account and billing, TNSLDC shall encash the LC amount of the concerned QCA.

13.8. In case of insufficient/exhausted LC amount, QCA shall make up LC amount within seven (7) days from receipt of such information from TNSLDC. Failure to make up LC amount within prescribed time limit, the Wind/Solar generation which QCA is representing shall not be scheduled.

14. MECHANISM FOR MONITORING COMPLIANCE:

14.1. **The event of breach or default of the procedure shall be as follows:**

14.1.1. Non-payment or delay in payment of Deviation Charges.

14.1.2. Non-compliance of any of the terms/conditions/rules outlines under this procedure.

14.1.3. Non-compliance of any of the directives as per the provisions of this regulation issued by TNSLDC.

14.1.4. Obtaining registration on the basis of false information or by suppressing material information.

14.1.5. QCA fails to provide schedules continuously for 10 days.

14.1.6. Non-availability of real time data continuously for three (3) days without justified reason.

14.1.7. In case the Available Capacity (AvC) is intentionally and repeatedly mis-declared by the QCA.

14.1.8. Non-submission of accounts to TNSLDC relating to de-pooling of deviations charges prepared by the QCA.

14.1.9. Non-payment of RE DSM charges to RE DSM Pool by QCA for consecutive three (3) weeks.

14.1.10. In case the QCA has insolvent.

14.1.11. In case of continued default of statutory complaints leading to declaration of wilful defaulter by competent authority

14.2. **Consequences for event of default:**

14.2.1. If schedule is not provided by the QCA (default as per 14.1.5) then the previous day's schedule (d-1) for those non-submission days shall be considered and DSM charges shall be computed accordingly. The non-submission of schedule shall attract scheduling charges as per the provisions of the TNSLDC's ARR approved by Hon'ble TNERC as amended from time to time.

14.2.2. In case of default for acts covered under as per 14.1.1 to 14.1.11 without prejudice to other actions as may be taken by TNSLDC, the TNSLDC shall issue a notice of period not

less than 15 days for revocation of registration of QCA and non- scheduling of pooling Sub-station to which said QCA represents and adequate opportunity shall be given to QCA to present its case before TNSLDC.

14.2.3. In case QCA fails to address/rectify the breach expressed by TNSLDC in the Notice within stipulated time, the TNSLDC shall proceed with revocation of registration of QCA and disconnection from grid.

15. GRIEVANCE REDRESSAL:

15.1. TNSLDC shall refer the Complaints regarding unfair practices, delays, discrimination, lack of information, supply of wrong information or any other matters to the Commission for redressal.

15.2. Any disputes between QCA and concern generators shall be governed as per dispute resolution mechanism under their agreement failing which it shall be subject to jurisdiction of the TNERC. Pending the decision of the state commission, the directions of the TNSLDC shall be complied by the QCA and concerned generator(s).

16. REMOVAL OF DIFFICULTIES:

16.1. In case of any difficulty in implementation of this procedure, TNSLDC may approach the Commission for review or revision of the procedure with requisite details.

17. GENERAL:

17.1. All costs/expenses/charges associated with the application, including bank charges, Affidavits etc. shall be borne by the applicant.

17.2. The Generators and QCA shall abide by the provisions of the Electricity Act, 2003, the TNERC Regulations and Indian Electricity Grid Code and TNERC (State Grid Code) Regulation - 2005, and applicable CERC and TNERC regulations as amended from time to time.

17.3. This procedure aims at easy and pragmatic Forecasting, Accounting and Settlement of Deviations for Wind and Solar Generations. However, some teething problems may still be experienced. The various implications would be known only after practical experience

is gained by way of implementing these procedures. In order to resolve the same, this procedure shall be reviewed or revised by the TNSLDC with prior approval of Commission.

17.4. After approval of procedure by Hon'ble TNERC, TNSLDC shall undertake Pilot run of software for RE DSM and after go-live of RE DSM software there shall be trial run period of four (4) weeks for ensuring implementation of RE DSM in correct sense as envisaged in the regulation. Actual commercial settlement shall commence from start of week immediately after end of trial run period.

18. ANNEXURES & FORMATS:

18.1. List of Annexures and Formats are listed below:

Sr. No.	Particulars	Annexure / Format No.
1	Consent/Authorization Letter from Generator for appointment of QCA	ANNEXURE - I
2	Format for submission of Forecast & Revision	ANNEXURE - II
a	For Forecast and Schedule Data to be submitted by QCA	FORMAT – A
b	For Revision of Availability & Revision	FORMAT – B
3	Real-time Data Telemetry requirement	ANNEXURE - III
4	Application for Registration of QCA	ANNEXURE - IV
5	Technical Data of individual Generators	FORMAT – 1
6	PPA details of individual Generators in the Pooling Sub-station	FORMAT – 2
7	Format for Indemnity Bond to be submitted by QCA	FORMAT – 3
8	Undertaking to be given by Prospective QCA At The Time Of Registration	ANNEXURE - V
9	Declaration	ANNEXURE - VI

ANNEXURES AND FORMATS

Annexure – I

Consent/Authorization Letter from Generator for appointment of QCA

Proforma Consent Letter

Date:

To,
The Chief Engineer,
Grid Operation,
State Load Dispatch Centre,
Chennai-600002.

Sub : Appointment of QCA as per TNERC (Forecasting, Scheduling and Deviation Settlement and Related Matters for Wind and Solar Generation) Regulations, 2019.

Dear Sir/Madam,

We would like to inform you that we, as the Wind/Solar power generator at _____ Pooling Sub-station have decided to exclusively appoint only as the Qualified Coordinating Agency (QCA) for Forecasting, Scheduling and Commercial Settlement, as per the TNERC (Forecasting, Scheduling and Deviation Settlement and Related Matters for Wind and Solar Generation) Regulations, 2019.

Kindly find below the details of our capacity at_____ (Name) Pooling Sub-station having ____ MW.

S. No	Customer Name	No of WTGs/Panels	Contact Person	E-mail ID & Contact No.	Capacity in MW

We would like to state that henceforth the role of QCA at _____(Name) Pooling Sub-station will be taken care by _____

Contact Details:

- **Contact Person-1**:
  Name & Designation:
  Address:
  Phone No. (O): Mobile No.:
  E-mail:

- **Contact Person-2**:
  Name & Designation:
  Address:
  Phone No. (O): Mobile No.:
  E-mail:
- **Contact Person-3**:
  Name & Designation:
  Address:
  Phone No. (O): Mobile No.:
  E-mail:

Details of Forecasting Operations Desk:

Address:
Phone No. (O): Mobile No.:
E-mail:

This is for your kind information and records.

Regards,

Date: _____ Sign: _____

Place: _____ Authorized Signatory

Name: _____

Designation: _____

Name of Generator: _____

Seal:

Annexure – II

FORMAT – A: For Forecast and Schedule Data to be submitted by QCA for date: dd/mm/yyyy

(to be submitted a day in advance)

Pooling Sub-station Name: _____

Pooling Sub-station No.: _____

Name of QCA: _____

15 Min time block (96 Block in a day)	Time	Available Capacity (MW) - Day Ahead	Day Ahead Forecast (MW)
1	00:00 – 00:15		
2	00:15 – 00:30		
3	00:30 – 00:45		
4	00:45 – 01:00		
…			
…			
95			
96			

FORMAT – B: for Revision of Availability & Revision for date: dd/mm/yyyy

(to be submitted on the day of actual generation by QCA)

Pooling Sub-station Name: _____

Pooling Sub-station No.: _____

Name of QCA: _____

Revision No.: _____

15 Min time block (96 Block in a day)	Time	Current Available Capacity (MW)	Current Schedule (MW)
1	00:00 – 00:15		
2	00:15 – 00:30		
3	00:30 – 00:45		
4	00:45 – 01:00		
95			
96			

Annexure – III

Real-time Data Telemetry requirement (Suggested List)

Wind turbine generating plants:

- Turbine Generation (MW/MVAR)
- Wind Speed (meter/second)
- Generator Status (on/off-line)- this is required for calculation of availability of the WTG
- Wind Direction (degrees from true north)
- Voltage (Volt)
- Ambient air temperature (^oC)
- Barometric pressure (Pascal)
- Relative humidity (in percent)
- Air Density (kg/m^3)

For Solar generating Plants:

- Solar Generation unit/ Inverter-wise (MW and MVAR)
- Voltage at interconnection point (Volt)
- Generator/Inverter Status (on/off-line)
- Global horizontal irradiance (GHI) ($Watt/m^2$)
- Ambient temperature (^oC)
- Diffuse Irradiance ($Watt/m^2$)
- Direct Irradiance ($Watt/m^2$)
- Sun-rise and sunset timings
- Cloud cover (Okta)
- Rainfall (mm)
- Relative humidity (%)
- Performance Ratio

Annexure - IV

Application to be submitted for Registration as a Qualified Co-ordinating Agency (QCA) under the TNERC (Forecasting, Scheduling and Deviation Settlement and Related Matters for Wind and Solar Generation) Regulations, 2019.

Sr. No.	Name of the QCA	
1	Type of Generator	Wind / Solar
2	Location of Generator (Village, Tal, District)	
3	Total Installed Capacity of Generating Station	
	Total Number of Units with details	
4	Individual or on Behalf of Group of generators	
	If on behalf of Group of generators connected to a Common Pooling Sub-station	(Please attach consent from majority of Generators in terms of combined installed capacity in the Pooling Sub-station) (Please attach copy of agreement executed with Generators)
	Details of the individual Generators in the Pooling Sub-station	(Please attach names with installed capacity of each & individual Generator in the Pooling Sub-station)
5	Name & Voltage level of the Pooling Sub-station to which Generation is connected	
	Latitude & Longitude of Pooling Sub-station	
	Schematic diagram of Connectivity with the Grid & Metering Arrangement	(Please attach)
6	Whether any PPA has been signed: (Y/N)	If yes, then attach Affidavit indicating details as per Format-2
7	Metering Details	Meter No. 1. Main 2. Check
8	Contact Details of the Nodal Person	Name: Designation: Landline Number: Mobile Number: Fax Number: E - Mail Address:

	Contact Details of the Alternate Nodal Person	Name: Designation: Landline Number: Mobile Number: Fax Number: E - Mail Address:
	Contact Details of Control Room for Communication on Forecasting, Scheduling, Revisions, event of Curtailments etc.	Landline Number: Mobile Number: Fax Number: E - Mail Address:
9	Details of Payment towards Registration as QCA	
10	Technical Data of Generators	(Please attach detailed information as per Format: 1)
11	Statement of PPA of individual Generators in Pooling Sub-station	(Please attach detailed information as per Format: 2)
12	Indemnity Bond	(Please attach as per Format: 3)
13	Undertaking to be given by prospective QCA at the time of Registration.	(Please attach as per Annexure: V)
14	Declaration	(Please attach as per Annexure: VI)

15	Undertaking :	
(i)	We hereby undertake to abide by the instructions issued by the TNSLDC for compliance of regulatory provisions of TNERC (Forecasting, Scheduling, Deviation Settlement Mechanism and related matters of Wind and Solar Generating Stations) Regulations, 2019 and subsequent amendments thereof	
(ii)	We also undertake to inform TNSLDC regarding termination / breach of the agreement if any and shall not discharge the QCA functions without valid authorizations by Generators.	

Date: _____

Place: _____

Sign: _____

Authorized Signatory

Name: _____

Designation: _____

Name of QCA: _____

Seal:

ANNEXURE-V

UNDERTAKING TO BE GIVEN BY PROSPECTIVE QCA AT THE TIME OF REGISTRATION

Name: M/s.....

Name of QCA: .....

Postal address:

.....

[To be provided by the QCA on a 100 Rupees stamp paper]

1. We, as a QCA will be regulated by TNERC (Forecasting, Scheduling, Deviation Settlement and related matters of Solar and Wind Generating Stations) Regulations, 2019 and subsequent amendments thereof.

2. We shall be responsible for settlement of Deviation Charges as per the TNERC regulations for the pooling stations/ RE Generators for which we represent as a QCA.

3. We agree to provide the forecasting schedules to TNSLDC on Week ahead, day-ahead and intra-day basis on behalf of Wind and Solar pooling stations / RE Generator connected to STU / DISCOM substations.

4. We agree to provide the consent letter from all the generators connected to the pooling station/ RE Generator for being appointed as the QCA.

5. We understand that we can revise the day ahead schedules for a maximum of 16 revisions as per the regulations.

6. We agree that if there is any deviation from the schedule, then for such Energy, Deviation charges will be applicable as per the TNERC regulations and amended from time to time.

7. We shall be responsible for commercial settlements with the TNSLDC on behalf of wind and solar generators connected to the pooling station and RE generators.

8. We understand that TNSLDC will compute the Deviation charges of pooling stations as per TNERC FSDSM Regulations 2019 and publish the same on its website on a weekly basis.

10. We will abide by TNERC (Forecasting, Scheduling, Deviation Settlement Mechanism and related matters for Wind and Solar Generating Stations) Regulations, 2019, as amended from time to time for all transactions.

11. We shall establish necessary SCADA data of the turbine / inverter and pooling station for the purpose of monitoring and billing as per procedure.

12. We agree to provide payment security through an irrevocable Letter of credit for the amount equivalent to Rs.25,000 per MW for solar generation and Rs.50,000 per MW for wind generation.

13. We agree to provide WTG's/ Inverter wise static data and pooling stations details as per the formats specified by TNSLDC.

14. We agree that if payments against the Charges for Deviation Charges are delayed by more than two days i.e., beyond twelve (12) days from the date of issue of DSM account by TNSLDC, the defaulting QCA shall have to pay simple interest@ 0.06% for each day of delay. We further agree that in case the payment is not made by us even after a lapse of 60 days from issuance of DSM account, process to invoke LC shall be initiated by TNSLDC.

15. We agree to the above terms and conditions for registering as QCA with TNSLDC, Chennai, Tamil Nadu.

Details of Letter of Credit are enclosed.

(Name and Postal address of QCA)

.....
.....

.....
.....

For Pooling station:

TANGEDCO/DISCOM Substation Station:

Voltage level at injecting point:

List of generators connected to the pooling station along with installed capacity for which consent is obtained:

1.

2.

QCA Authorized Signatory

Annexure-VI

DECLARATION

(Declaration to be Signed by the M.D./CEO/Authorised Signatory of the Applicant (QCA))

I/We_____certify that all information furnished below is/are true to the best of my/our knowledge and belief.

I/We shall abide by such terms and conditions as stipulated by TNERC, TANTRANSCO, TANGEDCO, and TNSLDC with respect to DSM for Solar & Wind from time to time.

S.No	**Name of PSS**	**No of turbines/ Inverters**	**Capacity of Each turbine/Inverter**	**Total Capacity of PSS**	**Accepted as QCA (Yes or No)**
			Total capacity of PSS		

I/We hereby also confirm that: I/We have entered an agreement with all the generators connected to the _____pooling Stations as QCA and the Agreement is attached.

Date: _____ **Signature of the QCA**

Format – 1

Technical Details to be submitted by the QCA

Pooling Sub-station Name: _____

Pooling Sub-station No.: _____

Name of QCA: _____

For Wind turbine generating plants:

Sr. No.	Particulars
1	Type:
a	Manufacturer
b	Make
c	Model
d	Capacity
e	Unique WTG ID
f	Customer Name
g	Commissioning Date
h	Hub Height
i	Total Height
j	RPM Range
k	Rated Wind Speed
2	Details of PPA (Name of Procurer, Effective Date, Validity Date, per Unit Rate, Escalation in per unit energy rate per year (if any)
3	Performance Parameters:
a	Rated Electrical Power at Rated Wind Speed
b	Cut-In Speed
c	Cut-Out Speed
d	Survival Speed (Max. Wind Speed)
e	Ambient Temperature for Out of operation
f	Ambient Temperature for In Operation
g	Survival Temperature
h	Low Voltage Ride Through (LVRT) setting
i	High Voltage Ride Through (HVRT) setting
j	Lightening Strength (kA & in Coulombs)
k	Noise Power Level (db)
4	Rotor Parameters:
a	Hub Type
b	Rotor Diameter
c	Number of blades
d	Area Swept by blades
e	Rated Rotational Speed

f	Rotational Direction
g	Coning Angle
h	Tilting Angle
i	Design Tip speed ratio
5	Blade Details:
a	Length
b	Diameter
c	Material
d	Twist Angle
6	Generator Details:
a	Generator Type
b	Generator Speed
c	Winding Type
d	Rated Generation Voltage
e	Rated Generation Frequency
f	Generator Current
g	Rated Temperature of Generator
h	Generator Cooling
i	Generator Power Factor
j	kW/MW @ Rated Wind Speed
k	kW/MW @ Peak Continuous
l	Frequency Convertor
m	Filter - Generator side
n	Filter - Grid side
o	Turbine Power Curve
7	Transformer Details:
a	Transformer Capacity
b	Transformer Cooling type
c	Voltage
d	Winding Configuration
8	Weight Details:
a	Rotor
b	Nacelle
c	Tower
9	Over Speed Protection
10	Design life
11	Design Standard
12	Latitude
13	Longitude
14	COD Details

15	Past Generation History from the COD to the date on which DAS facility provided to TNSLDC
16	Elevation above Mean Sea level (MSL)

For Solar generating plants:

Sr. No.	**Particulars**
1	Latitude
2	Longitude
3	Elevation and Orientation angles of arrays or concentrators
4	The generation capacity of the Generating Facility
5	Elevation above Mean Sea level (MSL)
6	COD Details
7	Rated Voltage
8	Details of Type of Mounting: (Tracking Technology if used, single axis or dual axis, auto or manual)
9	Manufacturer and Model (of Important Components, Such as Turbine, Concentrators, Inverter, Cable, PV Module, Transformer, Cables)
10	DC installed Capacity
11	Module Cell Technology
12	I-V Characteristic of the Module
13	Inverter Rating at different temperature
14	Inverter Efficiency Curve
15	Transformer Capacity & Rating, evacuation voltage, distance form injection point

Format – 2

Pooling Sub-station Name: _____

Pooling Sub-station No.: _____

Name of QCA: _____

Sr. No.	Name of Generator	Installed Capacity (MW)	PPA with	Effective Date	PPA Validity Date	Rate per Unit (Rs.)

Date: _____

Place: _____

Sign: _____

Authorized Signatory

Name: _____

Designation: _____

Name of QCA: _____

Seal:

Format – 3

(*On the Non-Judiciary Stamp Paper*)

INDEMNIFICATION

The Renewable Energy generator and QCA shall keep TNSLDC indemnified at all time and shall undertake to indemnify, defend and save the TNSLDC harmless from any and all damages, losses, claims and actions, including those relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees and all other obligations by or to third parties, arising out of or resulting from the Registration of QCA under DSM Mechanism.

The Renewable Energy generator and QCA shall keep TNSLDC indemnified at all time and shall undertake to indemnify, defend and save the TNSLDC harmless from any and all damages, losses, claims and actions, arising out of disputes with TNSLDC, as well as with generators and QCA inclusive of confidentiality issues.

Date: _____

Place: _____

Sign: _____

Authorized Signatory

Name: _____

Designation: _____

Name of QCA: _____

Seal:

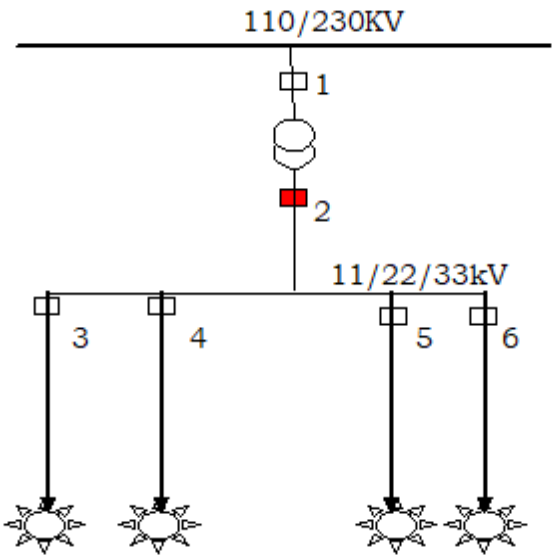
Abstract of Payments to be made to TNSLDC by the QCA

Sr. No.	Reason for Payment	Amount (Rs.)	Time of Payment
1	Registration Charges	20,000/-	During Application for Registration
2	Scheduling Charges	As per approved ARR	For every day
3	Forecasting services	3,000/-	Per day, if availed
4	Letter of Credit (irrevocable)	25,000/- per MW for Solar 50,000/- per MW for Wind	During Registration
5	Top-up of LC	As required	In the event of reduction in the amount as per Sr. No. 4
6	Mis-declaration charges (AvC)	Three times of deviation charges.	As required
7	Any other charges	As required	As required

Scheduling and Metering data for actual injection of Energy for Deviation Calculation with respect to each type of PSS

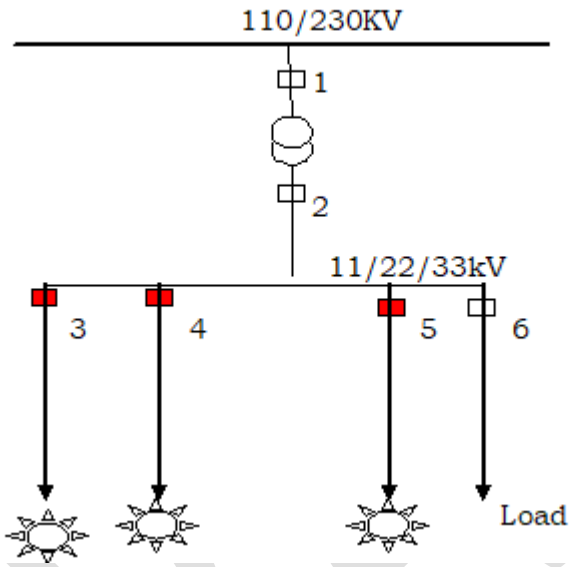
Case –I: (Pure Wind/Solar PSS)

QCA shall furnish the schedule at point No.2 for the particular PSS and 15 minutes energy data for the actual injection will be taken from the Meter at the same point No.2. (LV side of the Transformer) and Deviation shall be computed. The losses are applicable for DSM computation.



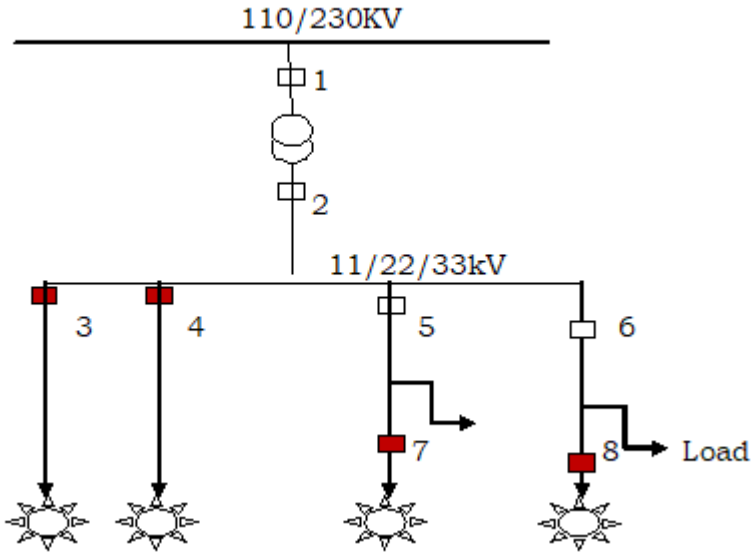
Case –II: (PSS with mixed Generation and Load)

QCA shall furnish the schedule combining point No.3,4 &5 for the particular case of PSS and 15 minutes energy data for the actual injection will be taken from the Meter at the points No.3,4,&5 (LV side of feeders) and Deviation shall be computed. The losses are applicable for DSM computation.



Case –III: (PSS with mixed Feeders)

QCA shall furnish the schedule combining point No.3,4,7 & 8 for the particular case of PSS and 15 minutes energy data for the actual injection will be taken from the Meter at the points No.3,4,7 & 8 (LV side of feeders and Generator end) and Deviation shall be computed. The losses are applicable for DSM computation.



Note: All the Comments/suggestions may be sent to this email Id: tnsldcredsm@gmail.com on or before 11.06.2019.