



# महाराष्ट्र विद्युत नियामक आयोग Maharashtra Electricity Regulatory Commission

MERC/Open Access/ MSLDC/1300/2018

Date: 7<sup>th</sup> December, 2018

To,  
Chief Engineer,  
Maharashtra State Load Dispatch Centre (MSLDC)  
Thane-Belapur Road,  
P.O. Airoli, Navi Mumbai-400708

**Subject: Procedure as per MERC (Forecasting, Scheduling and Deviation Settlement for solar and wind generation) Regulations, 2018**


**Reference No.:** CE/MSLDC/TECH/SO/02472 Dated 15 November, 2018

Sir,

This has reference to the procedure for implementation of Forecasting, Scheduling and Deviation Settlement for solar and wind generation, submitted by MSLDC vide letter dated 15 November, 2018.

I am directed to inform you that the Commission has approved the said procedure and the same is enclosed herewith. Further, it is also informed that the procedure needs to be uploaded on your website at the earliest.



  
(Prafulla Varhade)  
Director (EE), MERC

**Enclosed:** Approved procedure for implementation of Forecasting, Scheduling and Deviation Settlement for solar and wind generation



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

In accordance with  
The Maharashtra Electricity Regulatory  
Commission  
(Forecasting, Scheduling and Deviation  
Settlement of Solar and Wind Generation)  
Regulations, 2018

Prepared by

**Maharashtra State Load Despatch Centre**

**&**

**Approved by Maharashtra Electricity Regulatory  
Commission**

**7<sup>th</sup> December, 2018**



## TABLE OF CONTENTS

1. OUTLINE: .....	3
2. QUALIFYING CRITERIA FOR THE QCA: .....	3
3. ROLES AND RESPONSIBILITIES OF THE QCA: .....	4
4. ROLES AND RESPONSIBILITIES OF GENERATORS: .....	7
5. ROLES AND RESPONSIBILITIES OF MSLDC: .....	8
6. REGISTRATION AND DE-REGISTRATION PROCEDURE: .....	9
7. MSLDC FEES & CHARGES AND OTHER CHARGES: .....	12
8. COMMUNICATION MODE AND PROTOCOL: .....	13
9. FORECASTING AND SCHEDULING: .....	14
10. ENERGY ACCOUNTING: .....	20
11. DEVIATION ACCOUNTING: .....	21
12. DEVIATION CHARGES METHODOLOGY: .....	22
13. DEVIATION CHARGES PAYMENT MECHANISM: .....	30
14. MECHANISM FOR MONITORING COMPLIANCE: .....	31
15. GRIEVANCE REDRESSAL: .....	32
16. REMOVAL OF DIFFICULTIES: .....	32
17. GENERAL: .....	33
18. ANNEXURES & FORMATS: .....	34



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

### **1. OUTLINE:**

1.1. This Procedure is in accordance with the various provisions of MERC (Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation) Regulations, 2018, hereinafter referred as "the Regulations". All applicants shall abide by the provisions of the Regulations.

### **1.2. APPLICABILITY OF THE PROCEDURE:**

All Wind and Solar Energy Generators in Maharashtra connected to the Intra-State Transmission System, on or after the date notified by the Commission of coming into force of the Regulations, including those connected through Pooling Sub-Stations, and using the power generated for self-consumption or sale within or outside the State.

Provided that the combined installed capacity of the Solar or Wind Generators connected to a particular Pooling Sub-Station, or that of an individual Generator connected to some other Sub-Station, shall not be less than 5 MW.

Provided further that till further direction in this matter this Procedure shall not be applicable for Solar power generation projects developed under 'Mukhyamantri Sour Krishivahini Yojana' as these projects are load serving embedded generation connected to distribution network of distribution licensee.

### **2. QUALIFYING CRITERIA FOR THE QCA:**

2.1. As per Regulation 6.1 of MERC F&S Regulations, 2018, Generators at Pooling Substation shall appoint one amongst themselves or any other entity as QCA. The QCA shall 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 Substation, 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 one (1) year including pilot project work with appropriate accuracy levels in forecasting.

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 shall be in positive amounting to at least Rs.1.50 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 at least 51 % 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.

### **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 MSLDC 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 MSLDC 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 MSLDC.
- 3.5. The QCA shall establish protocol for communication with individual generators to implement the instructions of System Operators and MSLDC.
- 3.6. Declaration of Available Capacity of the Generating Station to MSLDC to which it is representing.
- 3.7. Provide aggregated Day ahead & Week ahead forecast (based on their own forecast or on the forecast done by MSLDC) and Schedule as per **Annexure - II** through a web-based application maintained by MSLDC.

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.

Provided further that, Generators/QCA and Buyers shall maintain Buyer-wise schedule information and protocol for sharing the same.

- 3.8. OCA in coordination with Generator shall provide real time data for power generation parameters (at Pooling Sub-Station level) and real time generation data (turbine and inverter level) and weather data wherever available as per **Annexure - III**.
- 3.9. In case of non-availability of Real Time Data (at Turbine Level /inverter Level), QCA in coordination with Generator 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\*  $\geq 1$  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.*

- 3.10. Bc Responsible for metering and data collection, transmission and co-ordination with RLDC, MSLDC, STU, CTU, MSEDCL and other agencies as per IEGC and CERC/MERC Regulations.
- 3.11. Undertake commercial settlement of all deviation-settlement charges as per applicable MERC and CERC DSM Regulations.
- 3.12. 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.
- 3.13. Prepare deviation accounts on weekly basis as per regulation 15 of the Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulations, 2018.
- 3.14. QCA shall execute an agreement with MSLDC wherein it is mentioned that QCA shall undertake all operational and commercial responsibilities on behalf of the Constituents as per the prevalent MERC Regulations.
- 3.15. Use Automatic meter reading (AMR) technologies for transfer, analysis and processing of interface meter data to MSLDC in line with Metering /AMR protocol and Metering/AMR standards to be finalised by STU in accordance with provisions of Metering Code and CEA Metering Regulations, as amended from time to time. STU/MSLDC/Transmission Licensee/Distribution Licensee, as the case may be, shall co-ordinate, facilitate and provide necessary support to Generators/QCA for installation of Meters and AMR facilities as per the Orders/directions of the Commission from time to time.
- 3.16. 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.

- 3.17. Shall furnish the PPA rates on notarized affidavit as per **Format - 2**, for the purpose of Deviation charge account preparation to MSLDC supported by copy of the PPA.
- 3.18. The QCA, within seven (07) days, shall inform the details to MSLDC 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 51 % of the total installed Capacity of the Pooling Sub-Station.
- 3.19. Keep MSLDC indemnified at all times and shall undertake to indemnify, defend and save the MSLDC 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 for a period of at least 2 years as per **Annexure - I**, for registration of QCA at MSLDC.
- 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 & MSLDC shall process the application of the QCA as per the provisions of this procedure and the decision of MSLDC on registration of QCA shall be binding on such generator.





4.3. In case of non-consensus among the generators connected through a common 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 MSLDC.

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

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

## **5. ROLES AND RESPONSIBILITIES OF MSLDC:**

5.1. MSLDC shall develop a web-based Software 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.
- Mechanism for monitoring deviations in Scheduled & Actual generation along with commercial impact for MSLDC and QCAs' along with acquisition of Meter Reading of all the Nodes in the State for calculation of Deviations and Charges thereof.

5.2. The MSLDC shall be responsible for scheduling, communication, coordination with QCAs'. Forecasting of the renewable energy generation shall be done by the MSLDC and the forecast will be available on the website. The generation forecast shall be done on the basis of the weather data provided by IMD or on the basis of other methods used by the Forecasting Agency whose service may be availed. However, the forecast by the MSLDC shall be with the objective of ensuring secure grid operation.



- 5.3. The MSLDC 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):**

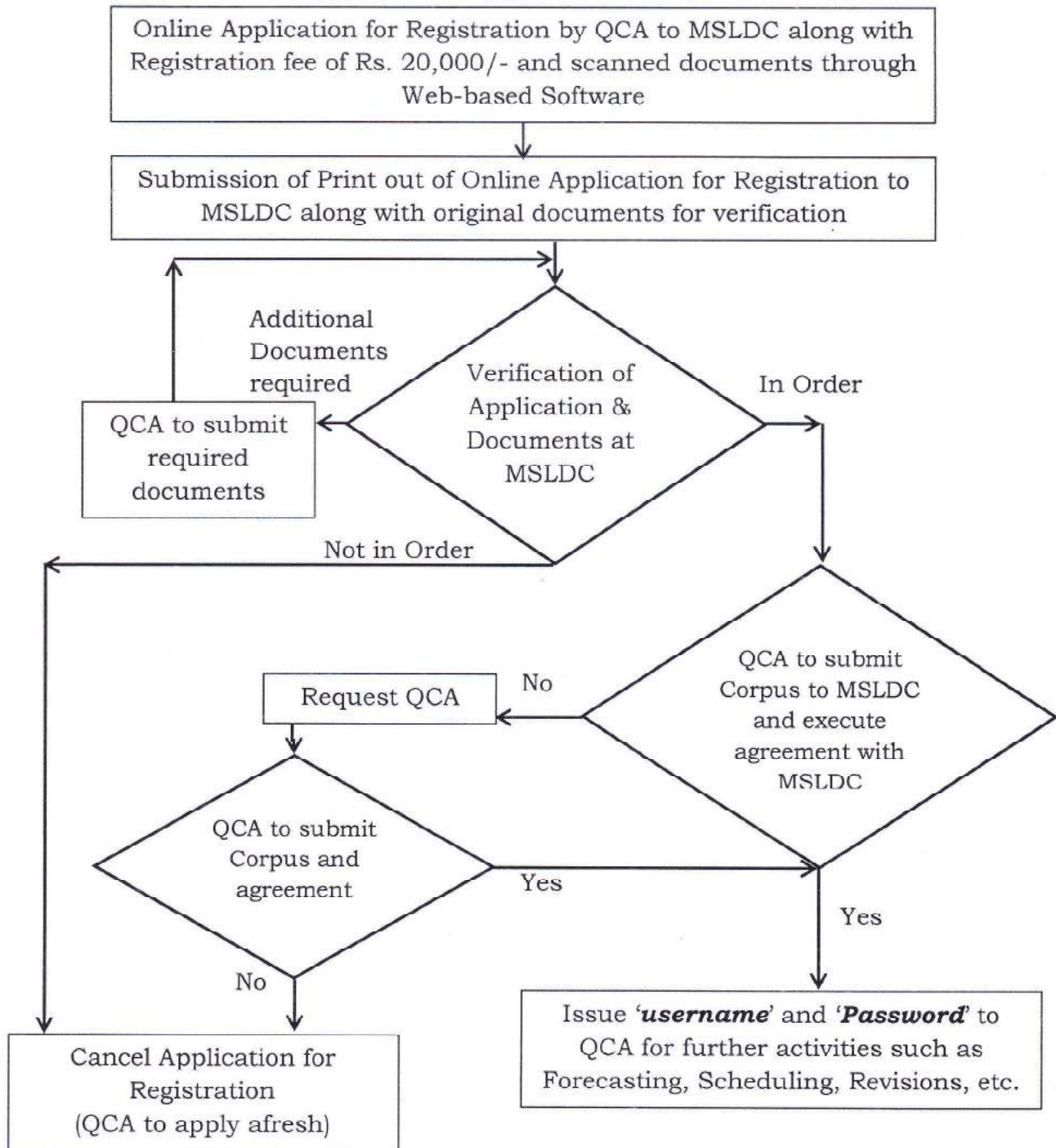
- 6.1. The application for Registration as a Qualified Co-ordinating Agency (QCA) should be submitted online through MSLDC's web-based Software.
- 6.2. The QCA shall submit separate application for each Pooling Sub-Station. For each Pooling Sub-Station only one application shall be accepted from the 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 at least 51 % 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
  - Communication arrangements with MSLDC 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.
- 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 MSLDC. Without receipt of the hard copy for verification purpose, MSLDC shall not process the online application for registration.
- 6.7. The details of Nodal Officers from MSLDC for processing applications for Registration and day to day activities towards forecasting, Scheduling and Revisions thereof shall be displayed on MSLDC'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 MSLDC.
- 6.10. After verification of all the documents, the QCA shall execute an agreement with MSLDC wherein it is mentioned that QCA shall undertake all operational and commercial responsibilities on behalf of the Constituents as per the prevalent MERC Regulations.
- 6.11. Within two (2) weeks from the date of Registration , the QCA shall deposit a corpus, to MSLDC towards payment security. 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 MSLDC and deposits Corpus, MSLDC 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 MSLDC 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 MSLDC 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 MSLDC.
- 6.16. The generator/s shall be responsible for appointing new QCA and ensure registration of new QCA at MSLDC 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 MSLDC, 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 MSLDC 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 MSLDC.

**Case - 3: De-registration under default condition:**

- 6.20. The MSLDC shall initiate the process of de-registration, if the condition as per Clause No. 3.18 is violated by the QCA.
- 6.21. The MSLDC 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 MSLDC within this notice period, post which generation shall not be scheduled.

**7. MSLDC FEES & CHARGES AND OTHER CHARGES:**

- 7.1. MSLDC fee and charges including scheduling fee and re-scheduling fee shall be payable by QCA as specified in the MSLDC ARR approved by the Commission time to time. Scheduling and re-scheduling charges shall be applicable per Pooling Sub-Station. The



other charges shall be levied as per the applicable MERC 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 MSLDC shall be transmitted with IEC: 104 protocol along with communication without any interruption by QCA.

The requirements for data visibility and interfacing requirements at MSLDC Kalwa/ ALDC Ambazari 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 MSLDC and depends upon data volume.
- Wind/Solar Generators shall submit request letter along with Single Line Diagram of their plant area to MSLDC for data points. MSLDC 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 MSLDC Kalwa & ALDC Ambazari 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 MSETCL 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 MSLDC Kalwa/ ALDC Ambazari.



- Integration of Real time data from RTU of any make in IEC-104 Protocol is to be done in MSLDC SCADA system. The work of integration will be carried out by M/s Siemens. In order to carry out integration work, MSLDC has approved the rates of integration to be paid by third party vendor to M/s Siemens. The rate for integration of one RTU in MSLDC-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 MSLDC 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 MSLDC for overall planning of resource requirements on day ahead basis in view of secure grid operation. The MSLDC may engage a forecasting agency to undertake forecasting for Wind & Solar Generators / Solar Parks / Wind Parks connected to InSTS.
- 9.2. The QCA shall provide Pooling Sub-Station wise forecasting for the Wind/Solar generators connected to Pooling Sub-Station to MSLDC based on their own forecast or may adopt forecast carried out by MSLDC.
- 9.3. In the event of QCA adopting forecast provided by MSLDC, charges amounting to Rs. 3,000/- per Pooling Sub-Station per day, shall be paid by the QCA to MSLDC. The consequences of any error in such forecast provided by MSLDC which results in a deviation from scheduling shall be borne by the concerned Generators through their QCA and QCA shall indemnify MSLDC on account of the commercial impact.
- 9.4. The MSLDC shall consolidate and forecast, based on various parameters and weather data obtained from IMD or from any other forecast service provider (which could be different from that provided by QCA)
- 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 three Decimal places.



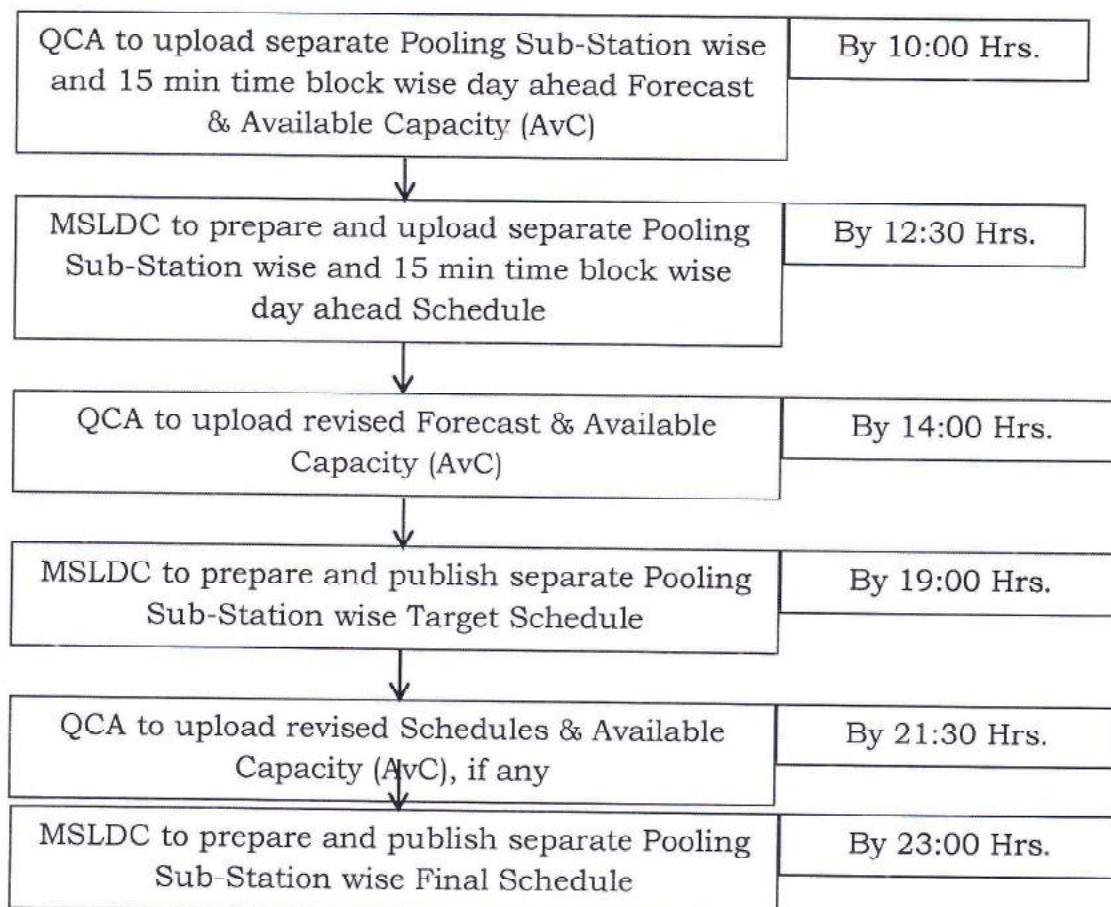
The forth Decimal place shall be rounded off to 3<sup>rd</sup> Decimal place as per standard practice. Deviation Volume and Value shall be calculated accordingly.

- 9.7. The QCA may revise Pooling Sub-Station schedule for the InSTS (excluding collective and inter-state bi-lateral transactions) by giving advance notice to the MSLDC;

Provided that, such revisions shall be effective from the forth (4<sup>th</sup>) time block following the time block in which notice was given.

**Provided further that, there may be one (01) revision for each time slot of one and half hours starting from 00.00 hours of a particular day, subject to a maximum of sixteen (16) revisions during the day.**

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



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



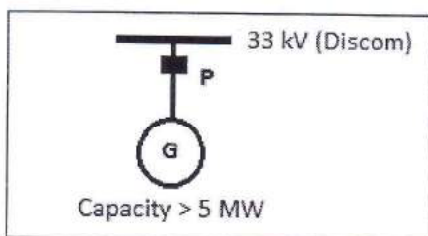


9.9. The various cases indicating point of Forecast and Scheduling are as follows:

**Inter-connection at Distribution Level:**

**Case - 1:**

**Single Generator or group of generators having capacity above 5 MW connected at 33 kV level of Discom's Pooling Sub-Station, selling power within the State:**



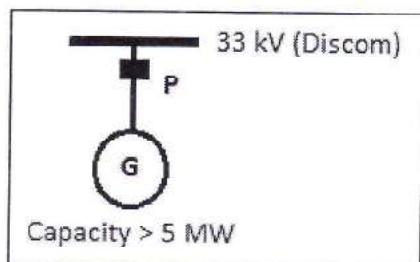
In this case, the Forecasting shall be provided by the QCA at Point 'P'. Scheduling and Accounting shall be done by MSLDC at Point 'P'.

The Distribution losses as approved by Hon'ble MERC 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 having capacity above 5 MW connected at 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 MSLDC at Point 'P'.

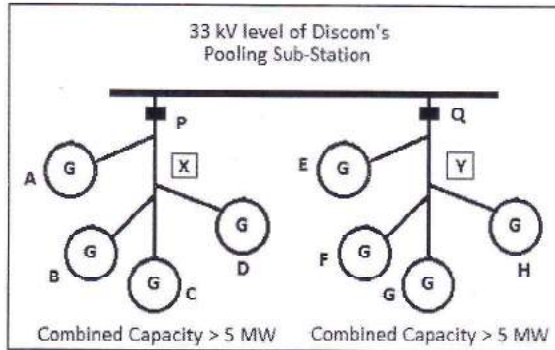
The Distribution losses and Transmission losses up to State Periphery as approved by Hon'ble MERC shall be applicable.

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 33 kV level of Discom's 33 kV 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. MSLDC shall Schedule at Point 'P' being Intra-State and at State Periphery for Point 'Q' by applying Transmission losses as approved by Hon'ble MERC.

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

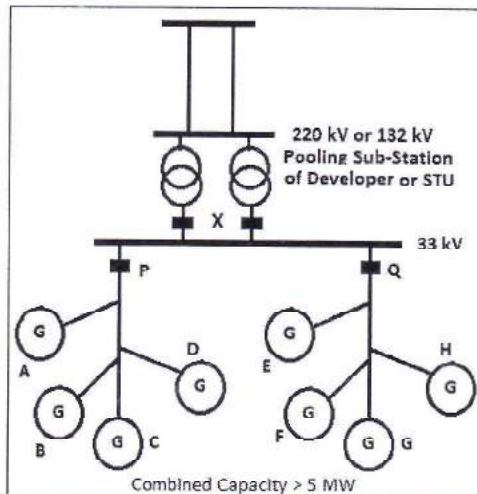
The QCA shall de-pool the deviation charges among respective generators separately based on the mechanism developed within themselves.

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 having capacity above 5 MW connected at 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 33 kV level of the EHV Pooling Sub-Station through common 33 kV feeders.

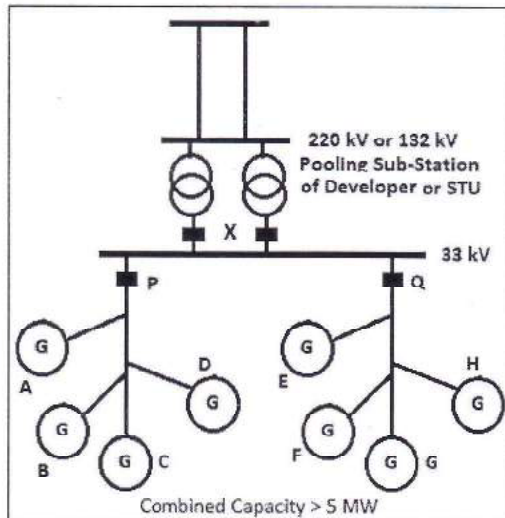
In such case, the Forecast shall be done by the QCA at Point 'X'. Scheduling and Accounting shall be done by MSLDC at Point 'X'.

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 having capacity above 5 MW connected at 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 33 kV level of the EHV Pooling Sub-Station through common 33 kV feeders.

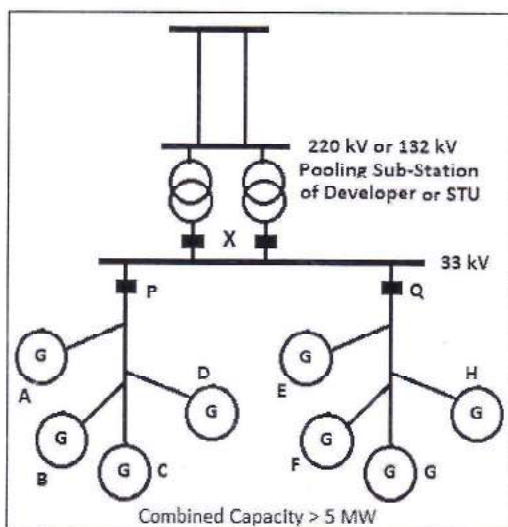
In such case, the Forecast shall be done by the QCA at Point 'X'. Scheduling and Accounting shall be done by MSLDC at State Periphery by applying Transmission Losses as approved by Hon'ble Commission as per Point 'X'.

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 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 33 kV level of the EHV Pooling Sub-Station through common 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

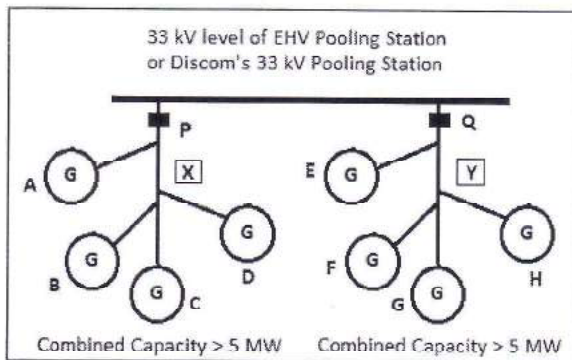
Inter-State respectively. MSLDC shall Schedule at Point 'P' being Intra-State and at State Periphery for Point 'Q' by applying Transmission losses as approved by Hon'ble MERC.



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 33 kV level of EHV Pooling Sub-Station or 33 kV Pooling Sub-Station of Discom, through dedicated feeder:**



In this case, Generators 'A' to 'D' and 'E' to 'H' are connected to a Pooling Sub-Station of STU or Discom through separate & dedicated feeders having separate inter-connection 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'.

MSLDC shall carry out scheduling and accounting for Pooling Sub-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, MSLDC shall separately schedule the power accordingly. For Inter-State schedules, Transmission Charges, as approved by Hon'ble MERC shall be applicable.

If the Pooling Sub-Station is of Discom, then Distribution losses as approved by Hon'ble MERC shall be applicable.



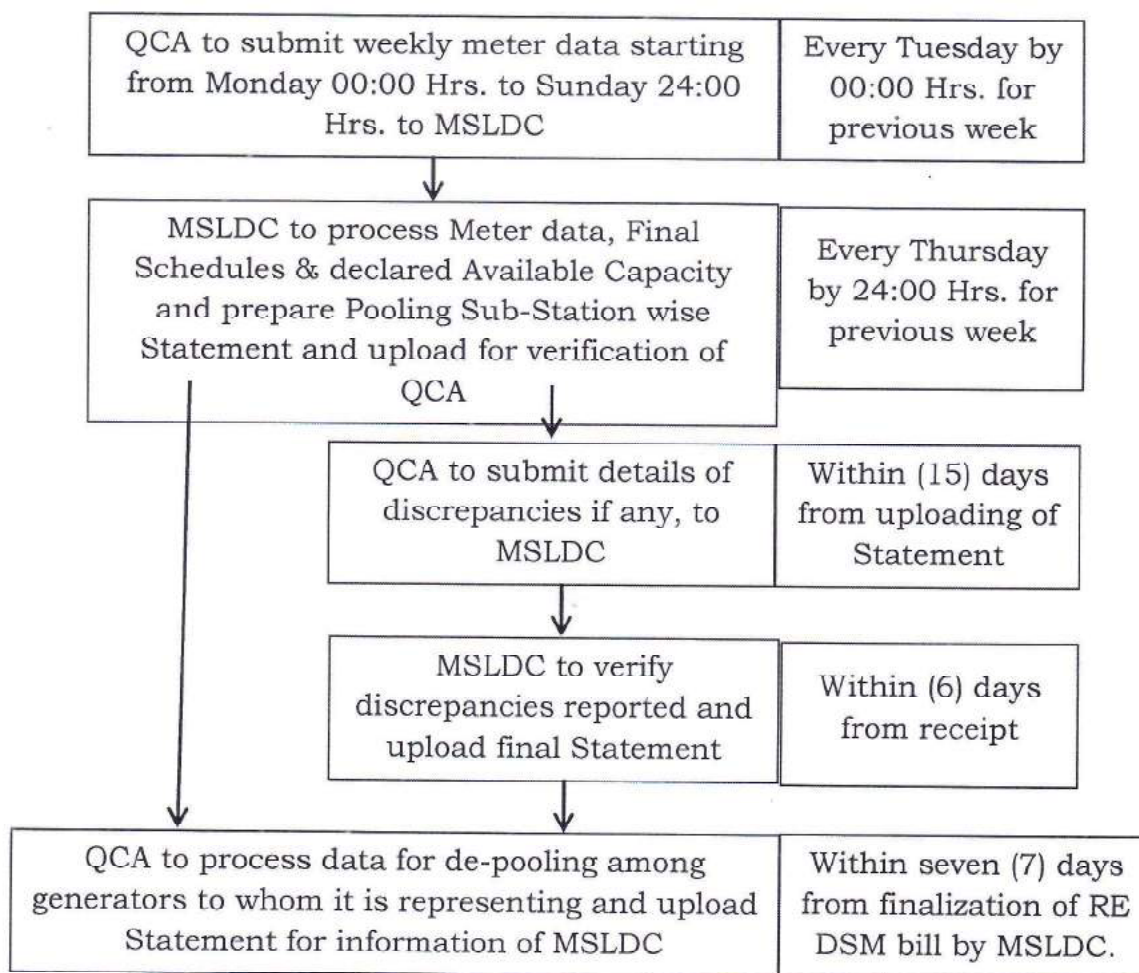
## 10. ENERGY ACCOUNTING:

- 10.1. The energy accounting shall be undertaken on the basis of the data recorded by the Special Energy Meters (SEM) provided at HV feeders at STU Pooling Sub-Stations capable of recording the energy in 15-minute time blocks. The SEM shall be under the control of STU for EHV Pooling Sub-Stations.
- 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 MSLDC, 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. MSLDC 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 MSLDC, and shall be accessible to the MSLDC through an IT-enabled system and software.
- 10.5. The QCA shall communicate any discrepancies to MSLDC within (15) days which shall be corrected forthwith by MSLDC after due verification.

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



10.6. The process chart for Accounting is as below:



### 11. DEVIATION ACCOUNTING:

- 11.1. MSLDC shall consider the deviation charges for the State as a whole at the periphery of the State as issued by WRPC weekly DSM bills.
- 11.2. MSLDC 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 WRPC weekly DSM bills.
- 11.3. MSLDC 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. Any shortfall in the aggregate amount of Deviation Charge payable by Solar and Wind Energy Generators at the State periphery and the amount receivable from them by the Pool Account shall be paid by the respective QCAs in proportion to their deviation reflected at the State periphery.
- 11.5. MSLDC shall compute the deviation charges and issue bills to the QCAs'.

## **12. DEVIATION CHARGES METHODOLOGY:**

12.1. All EHV Pooling Sub-Stations shall be classified in three categories i.e.

- a. **Intra-State Pooling Sub-Station:** where all wind & solar generators connecting through HV feeders are having delivery point within the State.
- b. **Inter-State Pooling Sub-Station:** where all the wind & Solar generators connecting through HV feeders are having delivery point out-side the State.
- c. **Mixed Pooling Sub-Station:** where some of the feeders are having delivery point outside the State and balance within the State.

### **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 Generator.

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 **Table - 1.**



**Table - 1**

<b>Sr. No.</b>	<b>Absolute Error in %age terms in 15-minute time block</b>	<b>Deviation Charge payable to Pool Account for Wind/Solar Generation</b>
1	< = 15%	None #
2	>15% but <=25%	At Rs. 0.50 per unit for the shortfall or excess beyond 15% and up to 25%
3	>25% but <=35%	At Rs. 0.50 per unit for the shortfall or excess beyond 15% and Up to 25% + Rs. 1.00 per unit for the balance energy beyond 25% and Up to 35%
4	>35%	At Rs. 0.50 per unit for the shortfall or excess beyond 15% and Up to 25% + Rs. 1.00 per unit for the shortfall or excess beyond 25% and Up to 35% + Rs. 1.50 per unit for the balance energy beyond 35%

[# : subject to the conditions specified in Regulation 12 of MERC F&S Regulations, 2018]

- 12.2.3. Even though there are no deviation charges for the deviation within +/- 15 %, the charges on account of impact on State periphery due to deviation shall be applicable.
- 12.2.4. 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.
- 12.2.5. Illustrative example for calculation of deviation and its apportionment of deviation charges for five Pooling Sub-Stations is as under in **Table - 2** & **Table - 3**.





**Table - 2**

<b>Pooling Sub-Station wise deviation charge calculation (for One Time block)</b>						
<b>Wind Pooling Sub-Station No</b>	<b>Available Capacity (kWh)</b>	<b>Schedule (MWh) (kWh)</b>	<b>Actual Injection (kWh)</b>	<b>Deviation (KWh)</b>	<b>% Deviation</b>	<b>Dev. Charges payable by Individual Pooling Sub-Stations (F)</b>
	<b>(A)</b>	<b>(B)</b>	<b>(C)</b>	<b>(D)</b>	<b>(E)</b>	
<b>W.P.S.</b>	<b>Av.C</b>	<b>Sch.</b>	<b>Act. Inj.</b>	<b>Dev.</b>	<b>Dev.</b>	<b>Deviation Charges (Rs.)</b>
<b>P.S. - 1</b>	35000	25000	32500	7500	21.43%	1,125
<b>P.S. - 2</b>	80000	50000	52500	2500	3.13%	-
<b>P.S. - 3</b>	120000	75000	90000	15000	12.50%	-
<b>P.S. - 4</b>	90000	50000	47500	-2500	-2.78%	-
<b>P.S. - 5</b>	55000	37500	20000	-17500	-31.82%	6,500
<b>Grand Total</b>	380000	237500	242500	ABS	11.84%	7,625
				45000		
<b>Net Exch. With Grid</b>	<b>380000</b>	<b>237500</b>	<b>242500</b>	<b>5000</b>		

**Table - 3**

<b>Apportionment of deviation charges</b>						
<b>Deviation Charge (Rs/kWh) as per the MERC F&amp;S Regulations</b>						
	<b>0</b>	<b>0.5</b>	<b>1</b>	<b>1.5</b>		<b>Deviation charges (Rs.)</b>
<b>Deviation (%)</b>	<b>15%</b>	<b>25%</b>	<b>35%</b>	<b>35%</b>		
<b>21.43%</b>	5250	2250	0	0	1125	1125
<b>3.13%</b>	2500	0	0	0	0	0
<b>12.50%</b>	15000	0	0	0	0	0
<b>-2.78%</b>	2500	0	0	0	0	0
<b>-31.82%</b>	8250	5500	3750	0	6500	6500
<b>11.84%</b>						

12.2.6. In order to calculate impact of RE deviation at State Periphery, a virtual pool of all Intra-State Pooling Sub-Stations and Intra-State part of mixed Pooling Sub-Stations shall be formed.



- 12.2.7. To determine the impact of RE deviation at State periphery, the part of DSM weekly bill issued by the WRPC shall be apportioned to the net deviation of Intra-State RE on the basis of applicable composite per unit rate (inclusive of additional DSM or capping DSM charge) for particular time block.
- 12.2.8. The apportionment of deviations of RE Pooling Sub-Stations shall be carried out for absolute deviation. Deviation percentage of each Pooling Sub-Station shall be carried out in percentage basis with respect to total absolute deviation of virtual pool.
- 12.2.9. Absolute deviation applicable for calculating impact of RE at State level shall be carried out by way of considering deviations of all the Pooling Sub-Stations together.
- 12.2.10. The illustrative example of impact of RE deviation at State periphery is as per **Table - 4**.
- 12.2.11. The RE Pooling Sub-Stations having deviations within +/- 15 % may not contribute to Pooling Sub-Station level deviation pool, however, this Pooling Sub-Station shall contribute to impact of RE deviation at State Periphery.



**Table - 4**

- Net Deviation at State Periphery : 5000 kWh
- Deviation charges at State periphery (UI charges) : Rs.3.0/-
- Total Deviation Charges on account of RE deviation at State periphery (D) : Rs. 15,000/-
- Total Deviation Charges collected from RE generators as per F&S Regulations (R) : Rs. 7,625/-
- Shortfall of deviation charges on account of RE generators (D-R) : Rs. 7,375/-

Apportion the shortfall to all P.S in proportion to their deviation									
Wind Pooling Station No	Available Capacity (kWh)	Schedule (MWh) (kWh)	Actual Injection (kWh)	Deviation (KWh)	% deviation	Dev. Charges payable by Individual Pooling Stations (F)	Apportionment of Net Deviation Charges amongst different Pooling Stations on the basis of different options (Rs.)		Total Dev. Charges in Rs. payable by Individual Pooling Stations
	(A)	(B)	(C)	(D)	(E)				
W.P.S.	Av.C	Sch.	Act. Inj.	Dev.	Dev.	Dev. Charges (Rs.) (R)	% contribution in RE Deviation	(Dev. Charges) (D-R)	Total in Rs. D-R +R
P.S. - 1	35000	27500	32500	5000	14.29%	-	16.39%	7,131	7,131
P.S. - 2	80000	50000	52500	2500	3.13%	-	8.20%	3,566	3,566
P.S. - 3	120000	75000	90000	15000	12.50%	-	49.18%	21,393	21,393
P.S. - 4	90000	50000	47500	-2500	-2.78%	-	8.20%	3,566	3,566
P.S. - 5	55000	37500	32000	-5500	-10.00%	-	18.03%	7,844	7,844
<b>Grand Total</b>	<b>380000</b>	<b>240000</b>	<b>254500</b>	<b>ABS</b>	<b>8.03%</b>	<b>-</b>	<b>100%</b>	<b>43,500</b>	<b>43,500</b>
				<b>30500</b>					
<b>Net Exch. With Grid</b>	<b>380000</b>	<b>240000</b>	<b>254500</b>	<b>14500</b>					

12.3. Calculation of impact of Wind/Solar generators at State Periphery shall be subject to revision in case the WRPC post facto revise DSM bill for concern week at any time.

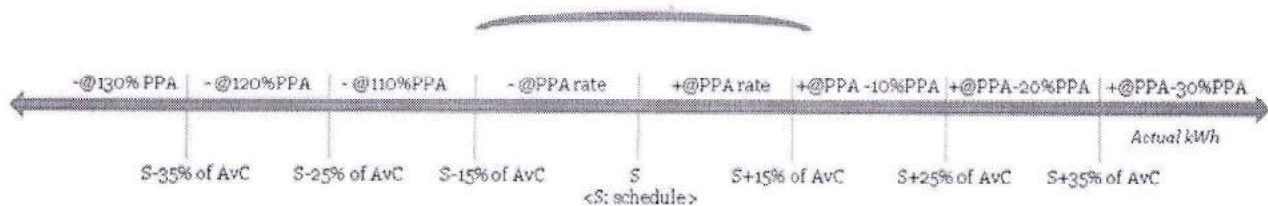
12.4. In case of calculation of impact of Wind/Solar generators at State periphery, an amount payable to Wind/Solar generators shall be paid if sufficient balance amount is available in RE DSM pool account. However, in case sufficient balance amount is not available, payment to Wind/Solar generators on account of impact at State periphery shall be paid when sufficient balance is made up in RE DSM pool account.

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

12.5.1. 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.



- 12.5.2. 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 MSLDC.
- 12.5.3. The Inter-State Schedule submitted by the QCA shall be grossed-up to State Periphery by applicable transmission losses at par with conventional scheduling & settlement mechanism and further shall be forwarded to Regional Load Despatch Centre (RLDC) to in-corporate in the State drawl schedule.
- 12.5.4. The MSLDC shall prepare the deviation settlement account for such Generator on the basis of measurement of the deviation in the energy injected as per CERC's F&S Regulation.
- 12.5.5. The rate for deviation settlement shall be based on PPA rates or in case of multiple PPAs, it will be based on Weighted Average PPA Rate.



- 12.5.6. The Generator shall pay the Deviation Charges applicable within Maharashtra in case of deviations in the State DSM Pool Account, the consequences of such deviation at the Inter-State level being governed by the CERC Regulations governing the Deviation Settlement Mechanism and related matters.
- 12.5.7. The Deviation Charges for actual injection is lower/higher than the scheduled generation (Under-Injection/Over-Injection) by Generators connected to the InSTS and selling or consuming power **outside Maharashtra** shall be in accordance with **Table - 5 & Table - 6**.



**Table - 5**

<b>Sr. No.</b>	<b>Absolute Error in %age terms in 15-minute time block</b>	<b>Deviation Charges payable to State DSM Pool Account</b>
1	< = 15%	At the fixed rate for the shortfall in energy for Absolute Error up to 15%
2	>15% but <=25%	At the fixed rate for the shortfall in energy for Absolute Error up to 15% (+) 110% of the fixed rate for the balance energy beyond 15% and up to 25%
3	>25% but <=35%	At the fixed rate for the shortfall in energy for Absolute Error up to 15% (+) 110% of the fixed rate for the balance energy beyond 15%, and up to 25% (+) 120% of the fixed rate for the balance energy beyond 25% and up to 35%
4	>35%	At the fixed rate for the shortfall in energy for Absolute Error up to 15% (+) 110% of the fixed rate for the balance energy beyond 15% and up to 25% (+) 120% of the fixed rate for balance energy beyond 25% and up to 35% (+) 130% of the fixed rate for the balance energy beyond 35%



**Table - 6**

<b>Sr. No.</b>	<b>Absolute Error in %age terms in 15-minute time block</b>	<b>Deviation Charges payable from State DSM Pool Account</b>
1	< = 15%	At the fixed rate for the excess energy up to 15%
2	>15% but <=25%	At the fixed rate for the excess energy up to 15% (+) 90% of the fixed rate for excess energy beyond 15% and up to 25%
3	>25% but <=35%	At the fixed rate for the excess energy up to 15% (+) 90% of the fixed rate for excess energy beyond 15% and up to 25% (+) 80% of the fixed rate for excess energy beyond 25% and up to 35%
4	>35%	At the fixed rate for the excess energy up to 15% (+) 90% of the fixed rate for excess energy beyond 15% and up to 25% (+) 80% of the fixed rate for excess energy beyond 25% and up to 35% (+) 70% of the fixed rate for excess energy beyond 35%

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

12.5.9. The MSLDC 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.

12.5.10. The generator or group of generators selling power outside the State shall not be the part of apportionment of impact at State Periphery and shall not form part of virtual pool in order to avoid double settlement.

**12.6. Deviation Accounting and settlement in ABT Regime at State Level (in FBSM):**

12.6.1. As per Intra-State ABT mechanism operating in the State known as Final Balancing and Settlement Mechanism (FBSM), any entity selling power outside the State or having Inter-State transaction shall be State Pool participant in FBSM.



- 12.6.2. In accordance with above provision, generators selling power out-side the State shall become State Pool Participants.
- 12.6.3. As an interim arrangement, till new deviation settlement mechanism in place of FBSM comes in force, Inter-State Wind/Solar generators shall be FBSM Pool members and bill will be calculated as per approved procedure for FBSM.
- 12.6.4. However, any amount payable/receivable by Inter-State Wind/Solar generators in FBSM pool shall be compensated from RE DSM Pool so as to balance Energy Pool and Zero-Sum Pool in FBSM.
- 12.6.5. The revisions in schedule received by MSLDC for Inter-State RE transactions under LTOA/MTOA shall be forwarded by MSLDC to WRLDC for incorporation in the State schedule and shall be governed by CERC F&S Regulation.
- 12.6.6. In case of revisions in schedule of Inter-State RE transactions under STOA, it shall be governed by the provisions of CERC's Open Access Regulations.
- 12.6.7. In case of Collective transactions, no revisions are allowed.

### **13. DEVIATION CHARGES PAYMENT MECHANISM:**

- 13.1. All the commercial transactions shall be through Electronic Clearance System (ECS) only.
- 13.2. The QCA shall open Bank Account in any Nationalized Bank and intimate the details of the same to MSLDC.
- 13.3. The Deviation Charges shall be paid by the QCA within ten (10) days from the issue of the accounts and billing by the MSLDC.
- 13.4. If the QCA fails to pay charges within time frame, a late payment surcharge amounting to 1.25% per month shall be levied for the period of delay.
- 13.5. The responsibility of ensuring the payment of the Deviation Charges to the MSLDC by the QCA shall remain to that of the concerned Generators.
- 13.6. After successful registration of the QCA, it shall be the responsibility of the QCA to deposit corpus to ensure payment security mechanism which shall needs to be maintained as per Clause no. 13.7.



- 13.7. The amount of the corpus 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.
- 13.8. In case of insufficient/exhausted corpus, QCA shall make up corpus amount within seven (7) days from receipt of such information from MSLDC. Failure to make up corpus amount within prescribed time limit, the Wind/Solar generation which QCA is representing shall not be scheduled.
- 13.9. If the QCA fails to pay deviation charges within Ninety (90) days from the issue of the accounts and billing, MSLDC shall utilize the corpus deposited by the QCA during registration process for payment of deviation charges.

**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 MSLDC.
- 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 MSLDC 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 become insolvent





14.1.11. In case of continued default for statutory compliance 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 MSLDC's ARR approved by Hon'ble MERC 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 MSLDC, the MSLDC 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 MSLDC.

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

**15. GRIEVANCE REDRESSAL:**

15.1. MSLDC 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 the dispute resolution mechanism under their Agreement, failing which it shall be subject to jurisdiction of the MERC. Pending the decision of the State Commission, the directions of the MSLDC 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, MSLDC 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 MERC Regulations and Indian Electricity Grid Code and MERC (State Grid Code) Regulation - 2006, and applicable CERC and MERC 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 MSLDC with prior approval of Commission.
- 17.4. After approval of procedure by Hon'ble MERC, MSLDC shall undertake development of software for RE DSM and after go-live of RE DSM software there shall be trial run period of (8) weeks for ensuring implementation of RE DSM as envisaged in the regulation. Actual commercial settlement shall commence from start of week immediately after end of trial run period or from such other date to be notified separately.



## 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



## **ANNEXURES AND FORMATS**



**Consent/Authorization Letter from Generator for appointment of  
QCA**

**Proforma Consent Letter**

Date:

To,  
The Chief Engineer,  
Maharashtra State Load Dispatch Centre,  
Thane-Belapur Road, P.O. Airoli,  
Navi Mumbai - 400 708.

Sub : Appointment of QCA as per MERC (Forecasting, Scheduling and Deviation Settlement for Solar and Wind Generation) Regulations, 2018.

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 MERC (Forecasting, Scheduling and Deviation Settlement for Solar and Wind Generation) Regulations, 2018.

Kindly find below the details of our capacity at \_\_\_\_\_ 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 \_\_\_\_\_ 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:** \_\_\_\_\_

<b>15 Min time block (96 Block in a day)</b>	<b>Time</b>	<b>Available Capacity (MW) - Day Ahead</b>	<b>Day Ahead Forecast (MW)</b>
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.:** \_\_\_\_\_

<b>15 Min time block (96 Block in a day)</b>	<b>Time</b>	<b>Day Ahead Schedule (MW)</b>	<b>Current Available Capacity (MW)</b>	<b>Revised Schedule (MW)</b>
1	00:00 - 00:15			
2	00:15 - 00:30			
3	00:30 - 00:45			
4	00:45 - 01:00			
95				



96				
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**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 (°C)
- Barometric pressure (Pascal)
- Relative humidity (in percent)
- Air Density (kg/m<sup>3</sup>)

**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<sup>2</sup>)
- Ambient temperature (°C)
- Diffuse Irradiance (Watt/m<sup>2</sup>)
- Direct Irradiance (Watt/m<sup>2</sup>)
- Sun-rise and sunset timings
- Cloud cover (Okta)
- Rainfall (mm)
- Relative humidity (%)
- Performance Ratio



**Application to be submitted for Registration as a Qualified Co-ordinating Agency (QCA) under the MERC (Forecasting, Accounting and Deviation Charge Settlement of Solar & Wind Generation) Regulations, 2018**

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 at least 51 % of Generators 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 Notarized 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)

Date: \_\_\_\_\_

Sign: \_\_\_\_\_

Place: \_\_\_\_\_

Authorized Signatory

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Name of QCA: \_\_\_\_\_

Seal:



**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:**

<b>Sr. No.</b>	<b>Particulars</b>
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 MSLDC



16	Elevation above Mean Sea level (MSL)
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**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**

**(To be submitted on Notarized Affidavit)**

**Pooling Sub-Station Name:** \_\_\_\_\_ **Pooling Sub-Station No.:** \_\_\_\_\_

**Name of QCA:** \_\_\_\_\_

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

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 MSLDC indemnified at all time and shall undertake to indemnify, defend and save the MSLDC 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 MSLDC indemnified at all time and shall undertake to indemnify, defend and save the MSLDC harmless from any and all damages, losses, claims and actions, arising out of disputes with MSLDC, 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 MSLDC by the QCA**

<b>Sr. No.</b>	<b>Reason for Payment</b>	<b>Amount (Rs.)</b>	<b>Time of Payment</b>
1	Registration Charges	20,000/-	For each Pooling Sub-Station during Application for Registration
2	Scheduling Charges	2,250/-	For every day
3	Revision in Schedules	2,250/-	For every revision
4	Forecasting services	3,000/-	Per day, if availed
5	Corpus	25,000/- per MW for Solar 50,000/- per MW for Wind	During Registration
6	Top-up of Corpus	As required	In the event of reduction in Corpus as per Sr. No. 5
7	Any other charges	As required	As required

