Office of the Chief Engineer / SLDC
SLDC Building, Ablowal, Patiala-147001

Procedure

For

Forecasting, Scheduling and Deviation Settlement

of Solar & Wind Generation

In accordance with

Punjab State Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019

As approved by

Punjab State Electricity Regulatory Commission

1. OUTLINE:-

This procedure is in accordance with the Punjab State Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019, hereinafter referred as "the Regulations". All the applicants shall abide by the provisions of the Regulations . In case of any inconsistency in the provisions of this procedure with the Act/Regulations/Rules framed under the Act, the provisions of the Act/Regulations/Rules shall prevail.

2. Definitions and Interpretation

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

$$\text{Absolute Error (\%)} = \frac{[\text{Actual Generation-Scheduled Generation}]X100}{(AvC)}$$

i. **'Act'** means the Electricity Act, 2003 (36 of 2003);

ii. **'Actual drawal'** in a time-block means the electricity drawn by a buyer, as the case may be, as measured by the interface meters

iii. **'Actual injection'** in a time-block means electricity generated or supplied by the seller, as the case may be, measured by the Interface meters;

iv. **'Available Capacity (AvC)'** for wind or solar generators, which are State Entities, means the cumulative rating of wind turbines or solar inverters that are capable of generating power in a given time-block;

v. **'Beneficiary'** means a person purchasing electricity generated from a generating station including a captive generating station;

vi. **'Buyer'** means a person, including beneficiary, distribution licensee or open access consumer, purchasing electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access

vii. **'Central Commission (CERC)'** means Central Electricity Regulatory Commission referred to in subsection (1) of Section 76 of the Act

viii. **'Commission'** means Punjab State Electricity Regulatory Commission constituted under sub-section (1) of section 82 of the Act

ix. **'Deviation'** in a time-block for a Seller means its total actual injection minus its total scheduled generation and for a Buyer means its total actual drawal minus its total scheduled drawal.

x. **'Deviation Settlement Mechanism (DSM)'** means the mechanism in accordance with regulation 6.0 of the regulations.

xi. '**Existing RE Generator'** shall mean Wind or Solar Generator as per Sr.no. xiv below, that has been commissioned prior to the date of notification of the Regulations;

xii. **'Forecasting'** means the projection of likely future electricity generation based on scientific analysis of meteorological data and other relevant parameters

xiii. **'Gaming'** in relation to the regulations, shall mean an intentional mis-declaration of available capacity or schedule by any seller in order to make an undue commercial gain through deviation charges;

xiv. **'Generator' or 'RE Generator'** means a Wind or Solar Generator connected to the State Transmission System or distribution system covered under the regulations.

xv. **'Grid Code or State Grid Code'** means the Grid Code specified by the Commission under clause (h) of sub-section (1) of Section 86 of the Act;

xvi. **'Indian Electricity Grid Code (IEGC)'** means the Grid Code specified by CERC under clause (h) of sub-section (1) of section 79 of the Act;

xvii. **'Interface meter '** means the interface meter as defined in Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time;

xviii. **'Interconnection/Interface Point'** means a point at which an individual wind/solar generating plant or a group of such generating plants are connected to the transmission or distribution system, as the case may be;

xix. **'New RE Generator'** shall mean Wind or Solar Generator as per Sr.no. xiv above, that has been commissioned subsequent to the date of notification of the Regulations.

xx. '**Northern Regional Power Committee (NRPC)**' means a committee established by resolution by the Central Government for a Northern region for facilitating the integrated operation of the power systems in northern region.

xxi. '**Open Access Regulations'** means Punjab State Electricity Regulatory Commission (Terms and Conditions of Intra-State Open Access) Regulations, 2011, as amended from time to time;

xxii. **'Pool Generator'** means a Wind or Solar Generator of any capacity connected to a pooling station with a combined capacity of 5 MW or above (represented through a QCA).

xxiii. **'Pooling Station'** means the sub-station where pooling of generation of individual wind or solar generators is done for interfacing with the next higher voltage level. Provided that where there is no separate pooling station for a wind/solar generator and the generating station is connected through common/dedicated feeder and terminated at a Sub Station of distribution company/STU, the sub-station of the distribution company/STU shall be considered as the pooling station for such wind or solar generator, as the case may be.

xxiv. **PSPCL'** means Punjab State Power Corporation Limited, a successor company of the erstwhile Punjab State Electricity Board (PSEB), notified as the Distribution Licensee

(discom) by Government of Punjab and entrusted with the work of Generation and Distribution business of erstwhile PSEB.

xxv. **'PSTCL'** means Punjab State Transmission Corporation Limited, a successor company of erstwhile Punjab State Electricity Board (PSEB), notified as State Transmission Utility (STU) by Government of Punjab and entrusted with the work of transmission business of erstwhile PSEB and responsibility to operate the SLDC.

xxvi. **'Qualified Coordinating Agency (QCA)'** means the agency coordinating on behalf of wind/solar generators connected to a pooling station to perform the functions and discharge the obligations as specified in the regulations.

xxvii. **'Scheduled Generation'** at any time or for a time block or any period means schedule of generation in MW or MWh ex-bus given by the State Load Despatch Centre (SLDC)

xxviii. **'Scheduled Drawal'** at any time or for a time block or any period time block means schedule of dispatch in MW or MWh ex-bus given by the State Load Despatch Centre (SLDC).

xxix. **'Seller'** means a person, including a generating station, supplying electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access

xxx. **'Stand-alone Generator'** means a Wind or Solar Generator with individual capacity of 5 MW or above connected to the State Transmission System or distribution system (represented by itself).

xxxi. **'State Entity'** means an entity which is in the SLDC control area and whose metering and energy accounting is done at the State level

xxxii. **'State Load Despatch Centre' or 'SLDC'** means the Load Despatch Centre of the State established under sub section (1) of section 31 of the Act, responsible for co-ordinating scheduling of the state entities in accordance with the provisions of State Grid Code

xxxiii. **'State Pool Account'** means a separate account to be maintained by SLDC for receipts and payments on account of deviation, specified by the Commission

xxxiv. **'Time-Block'** means a time block of 15 minutes or such shorter duration, as may be specified by the Commission, for which specified electrical parameters and quantities are recorded by Special Energy Meter, with first time block starting at 00.00 hrs.

3. Applicability:-

This Procedure shall be applicable to all wind and solar generators with individual capacity of 5 MW and above connected to the State Transmission System or distribution system or wind and solar generators of any capacity connected through pooling stations to the State Transmission System or distribution system with combined capacity of 5 MW and above, supplying power to the distribution company (ies) or to the third party through open access or for captive consumption through open access within or outside the State.

4. Role & Responsibilities of Stand-alone Generators:

i The Chief Operational person/ In-charge of a Stand-alone Generator shall be responsible for scheduling for the generating station and shall notify the name, designation and contact details (phone, fax, mobile and e-mail) of the Scheduling Officer for its Plant to SLDC from time to time.

ii The Stand-alone generator shall establish a round the clock Control Center and shall be responsible for control of its Generation/ Injection. The Control Centre shall have facilities of voice communication with SLDC with voice recording facilities, Fax machine and internet connection available for all the 24 hours.

For the purpose of Grid security and safety, the generator shall comply with the instructions of the System Operator in normal condition as well as during emergencies.

iii The Stand-alone generator shall establish alternate voice, text and data communication with SLDC to implement the instructions of System Operators and SLDC.

iv The Stand-alone generator shall be responsible for declaration of Available Capacity of its Generating Station to SLDC.

v The Stand-alone generator shall provide Wind Turbine Generating plant (WTG's) / Inverter's static data details as per the proforma at **Annexure-IA** for wind, **Annexure-IB** for solar and further any change in the information furnished earlier shall be shared with SLDC within 7 working days from the change.

vi Stand-alone Generator shall provide real time data for power generation parameters and real time generation data (turbine and inverter level) and weather data wherever available as per **Annexure-II.**

vii The Stand-alone generator shall have fully functional forecasting and scheduling tools to obtain the desired output. It shall provide Day ahead & Week ahead forecast (based on its own forecast or on the forecast done by SLDC) and Schedule as per **Annexure – III** through a web-based application maintained by SLDC.

viii Till the web-based application is made operational, the day ahead and week ahead schedule shall be provided to the SLDC Control Room through Fax/e-mail)

Provided that separate schedule for inter and or intra state transaction shall be supplied.

Provided further that, Stand-alone Generators shall maintain Buyer-wise schedule information and protocol for sharing the same.

ix

x In case of non-availability of Real Time Data (at Turbine Level /inverter Level), 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 time block 'level (15-min or lesser, as the case may be)

- For solar plants, for all inverters* >= 1 MW:
  Average Solar Irradiation, Average power generation at time block level (15-min or lesser, as the case may be)

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

xi The Stand-alone generator shall be responsible for metering, data collection/ transmission and communication and historical data maintenance in co-ordination with concerned agencies (STU/SLDC/CTU/RLDC/PSPCL etc.) and for co-ordination with SLDC, RLDC, STU (PSTCL), CTU, PSPCL and other agencies in line with the provisions of PSERC/ CERC Regulations.

xii The Stand-alone generator shall be responsible for the settlement of Deviation charges with the SLDC and it shall be liable to pay & receive Deviation Charges.

xiii The Stand-alone generator shall maintain records and accounts of the time block-wise Schedules, the actual generation injected and the deviations, so that it could be sent to SLDC (maximum within 7 days from the date of demand from SLDC).

xiv The Stand-alone generator shall use Automatic meter reading (AMR) technologies for transfer, analysis and processing of interface meter data to SLDC in line with Metering / AMR protocol and Metering/ AMR standards to be finalized by SLDC/ PSTCL/ PSPCL in accordance with provisions of Metering Code and CEA Metering Regulations, as amended from time to time. However, until AMR system is established, the monthly energy meter reading shall be downloaded by the field office of PSPCL/PSTCL along with a representative of the Stand-alone generator as per standard practices.

xv The Stand-alone generator shall abide by the Punjab state Electricity Regulatory Commission (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019 as amended from time to time.

xvi The Stand-alone generator shall furnish the PPA rates on notarized affidavit (in case of Inter-State transactions) as per **Annexure-IVA**, for the purpose of Deviation charge account preparation to SLDC supported by a copy of the PPA.

xvii The Stand-alone generator shall submit the indemnity bond on Non Judicial Stamp paper of value notified by the State Government from time to time, duly attested by a Notary Public, (as per **Annexure-IV B**) to keep the SLDC indemnified at all times and shall undertake to indemnify, defend and save the SLDC 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.

xviii The Stand-alone generator shall coordinate for periodical testing and calibration of Interface Meters as per CEA metering Regulations and procedures of the PSTCL/ PSPCL.

5. The Qualified Coordinating Agency (QCA):

i. The Pool Generators shall appoint one amongst themselves or any other mutually agreed agency to act as Qualified Coordinating Agency (QCA) for coordinating on their behalf with SLDC. The pool generators shall give authorization/ consent atleast for a period of 2 years as per **Annexure-V** for registration of QCA at SLDC.

Provided that an individual pool generator may opt to function as a QCA on its own or appoint a separate entity as its QCA.

Provided further that separate pools shall be formed for generators involved in intra-state and inter-state transactions.

ii. An individual pool generator shall not appoint and authorize multiple QCAs for a particular Pooling Station. In such case, the authorization provided by the pool generator shall be treated as invalid. The decision of the SLDC on registration of QCA shall be binding on such pool generator.

iii. Once a QCA is registered, the pool generator shall not re-appoint another QCA, at least within two (2) years from the date of successful registration of the QCA at SLDC.

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

iv. The Qualified Coordinating Agency (QCA) shall be nominated on mutually agreed terms and conditions by the pool generators. The pool generators shall also inform SLDC to this effect. On submission of the consent letter from the pool generators and upon meeting the stipulated requirements, the Agency shall be registered as QCA for that pool/ pooling station and shall be treated as an intra-state entity for the purpose of the Regulations.

v. QCA shall be the single point of contact with SLDC on behalf of the pool generators for the following purpose:

a. Provide schedules with periodic revisions as per the Regulations on behalf of all the pool Generators.

b. Responsible for coordination with STU/SLDC and other agencies for metering, data collection and its transmission and communication.

c. Undertake commercial settlements on behalf of the pool generators, of such charges pertaining to generation deviations including payments of Deviation Charges to the State pool account through SLDC.

d. Undertake de-pooling of payments received/payable on behalf of the pool generators form/to the State Pool account and settling them with the individual pool generators in accordance with the Regulations.

e. Undertake commercial settlement of any other charges on behalf of the pool generators of a pooling station, as may be mandated from time to time.

f. All other ancillary and incidental matters.

vi. The QCA and pool generators shall mutually decide professional charges for forecasting, scheduling and deviation settlement payable to QCA.

vii. The pool generators shall provide all requisite details & data (including technical data, time-block wise schedule, actual injection and deviation details) to QCA for onward submission to SLDC.

viii. In case of non-consensus among the pool generators connected through a common feeder for appointment of QCA, then such pool generator(s) shall take separate connectivity from STU/DISCOM and furnish the schedules (individually if stand-alone or by appointing separate QCA), in accordance with the regulations and procedure.

ix. Non- performance of functions by QCA under the Regulations and procedure, shall not in any manner absolve the pool generator from meeting their responsibility provided under the Regulations and procedure.

6. Qualifying Requirement for QCA:

In case of appointment of any mutually agreed agency other than the Generator(s), the pool 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 pool generators and would facilitate smooth implementation of F&S framework in the State.

Operational requirements-

i The QCA shall be a company incorporated in India under the Companies Act, 1956/2013.

ii The QCA shall have fully functional forecasting and scheduling tools to obtain the desired output.

iii The QCA shall have the experience in the field of Wind and/or Solar Power forecasting and scheduling for 100 MW projects (including cumulative pilot projects) and a minimum period of one (1) year with appropriate accuracy levels in forecasting.

iv The QCA shall have an experience in working in different terrain & regions, as Wind /Solar generation depends on these factors and such experience facilitates better scheduling.

v The QCA shall have capability to handle multiple plant owners connected to a pooling station in order to be well positioned to de-pool deviation charges.

vi The financial strength of the QCA shall be such that it shall be in a position to handle the risk of penalties due to deviation charges applicable to pool generator. Considering this, the net worth of the QCA shall be a least RS. 1.50 Crores in the previous financial year (Net worth = Share Capital + Reserve - Revaluation Reserve - Intangible Asset - Misc. Expenditure to the extent not written off - Carried Forward Losses - Liabilities), which shall reflect from its audited accounts duly certified by the Charted Accountant.

vii The QCA shall have a compatible system in place for seamless flow of information to and from SLDC in order to facilitate forecasting, scheduling and revision of schedule, intimation of outages/grid constraints etc. and it shall have capability to provide real time monitoring systems in place for seamless flow of information to and from SLDC.

viii QCA shall have an established team of Renewable Resource Analysts, modeling Statisticians/ Data Scientists, Energy modelers and 24*7 operation and monitoring team.

ix QCA shall possess/provide the authorization/ consent letter and consent from all the pool generators connected to the pooling station or directly connected to the state network for being appointed as the QCA and from the concerned beneficiary(ies).

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

7. Role & Responsibilities of QCA:

Beside performing the Role and undertaking the Responsibilities of Stand-alone Generator (stipulated under Section 4 of this procedure) and supplying pooling station wise data as required by SLDC, QCA shall also perform the following roles & undertake the following responsibilities on behalf of pool generators:-

i As per the Regulations, QCA shall be a state entity and shall be the single point of contact between the SLDC and the pool generators to whom it is representing.

ii Besides establishing a round the clock control center, QCA shall also establish protocol for communication with pool generators to implement the instructions of System Operators and SLDC.

iii Besides providing WTG's / Inverter's static data as per the proforma **Annexure-lA & IB,** QCA shall also provide pool/ pooling stations details as per the proforma at **Annexure-lC**.

iv QCA shall provide real time data for pooling station wise power generation parameters and weather data wherever available as per **Annexure-II.**

v QCA shall provide pooling station wise Available Capacity, Day ahead & Week ahead forecast and Schedule as per **Annexure –III** on behalf of pool generators, through a web-based application maintained by SLDC or Fax/E-mail (till web based application is made operational).

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

vi QCA shall Perform commercial settlement beyond the connection point (De-Pooling arrangement among each pool generator) and technical coordination amongst the pool generators and up to the connection point as the case may be. DSM charges shall be de-pooled by the QCA amongst constituent pool generators on the basis of actual generation as provided in regulation 6.1(iv) of the Regulations.

vii QCA shall be responsible for all commercial settlements with the SLDC on behalf of pool generators .

viii QCA shall maintain records and accounts of the time block-wise Schedules, the actual generation injected and the deviations, for the Pooling Station and the individual pool generators separately.

8. Role & Responsibilities of SLDC:-

i. SLDC under SAMAST Scheme shall get a web-based Software with login and password facility developed for:

- Online registration/de-registration of Stand-alone generator/ QCA
- Uploading of Day Ahead and Week Ahead Generation Forecasts/ Schedules
- Uploading of the revisions in Schedules in accordance with these Procedures and Regulations.
- Intimation of Grid Constraints and curtailments if any.
- Mechanism for monitoring deviations in Scheduled & Actual generation along with commercial impact for SLDC and Stand-alone generators/ QCAs' along with acquisition of Meter Reading of all the Interface points in the State for calculation of Deviations and Charges thereof.

Till the web-based application is made operational, the day ahead and week ahead schedule/ revisions for each generating station or each pooling station shall be provided

to SLDC through Fax/e-mail, at the designated contact no./ e-mail ID (0175-2367490, scheduling@punjabsldc.org or as notified from time to time).

ii. SLDC shall be responsible for scheduling, day to day communication, coordination with generators/ QCAs'. **Forecasting of the renewable energy generation may be done by the SLDC by availing the services of a Forecasting Agency.**

iii. SLDC shall maintain records and accounts of the time block-wise Schedules, the actual generation and the deviations, for the pooling station and the individual Generators separately.

iv. SLDC shall prepare and issue Energy Account Statement (for declared Available Capacity, Scheduled Energy & Actual Injection) and DSM accounts in respect of each pooling station/ Standalone generator (separately for intra-state and inter-state transactions) and maintain record of the same.

v. All commercial transactions w.r.t. receipt/payment of deviation (DSM) charges from/ to RE generators shall be done through DSM pool account maintained by SLDC.

vi. The AMR system at SLDC end is expected to be made functional within one year after issue of funding by PSDF under SAMAST scheme. However, until Automated Meter Reading (AMR)/ remote data downloading facilities/ infrastructure is established at SLDC, Concerned field offices of distribution licensee (Sr.Xen/DS & Sr.Xen/MMTS of PSPCL) shall be responsible for timely downloading and supply of Interface meter data (duly signed hard copy & soft copy) to the SLDC for preparation of Deviation accounts. In case of Solar/ Wind Generators directly connected to PSTCL and selling power to 3rd party under open access or wheeling power for captive use within the State or outside the State, concerned filed offices of STU (Sr.Xen/ P&M of PSTCL) shall be responsible for downloading and supply of Interface meter data (duly signed hard copy & soft copy) to SLDC in coordination with the concerned field offices of PSPCL (Sr.Xen/ DS/ MMTS).

9. Registration and De-Registration Procedure for Stand-alone generator/ QCA:

9.1 Registration as a Stand-alone generator/ QCA:-

The procedure for registering a Stand-alone generator/ QCA is as follows:

i The prospective Stand-alone generator/ QCA shall submit application accompanied with prescribed fee as per the proforma (**Annexure-VI**) for registration. After operationalization of the SLDC's web-based software, the application should be submitted online through web-based Software and copy of printed application shall be supplied to SLDC along with required documents.

ii The QCA shall submit separate application for each Pooling Station. For each Pooling Station only one application shall be accepted from the QCA.

iii The Application for Registration shall be accompanied by a non-refundable processing fee of Rs. 10,000/- (Ten Thousand Rupees Only) for Stand-alone generators/ Rs. 20,000/- (Twenty Thousand Rupees Only) for QCA (for each pooling station) payable through RTGS/ NEFT.

In case of deposit/ receipt of less amount than the prescribed fee, the application shall not be processed until full payment is received in the account. Bank Charges, if any, shall be borne by the Stand-alone generator/QCA.

The present account details of Accounts Officer/ SLDC are State Bank of India A/c No. 65111588221 (IFSC Code: SBIN0050012).

Any change in these account details or procedures will be conveyed to the concerned through uploading on Punjab SLDC website.

iv **Each application for registration shall be accompanied with the following documents:-**

a. WTG's/Inverter's static data and pooling Stations details as per **Annexure-IA, IB & IC**. Further, if there is any change in the information furnished, then the updated information shall be furnished to the SLDC within 7 working days.
b. Undertaking on Non-Judicial Stamp paper of value notified by the State Government from time to time (attested by Notary) in regard to compliance for PSERC Regulations and its procedure as per **Annexure-IV B.**
c. Certified PPA rates (in case of inter-state transaction) on notarized affidavit as per **Annexure-IVA**, for the purpose of Deviation charge account preparation to SLDC supported by copy of the PPA.
d. Copy of Board Resolutions for Authorized Signatory/ Power of Attorney/ Authorization Letter, duly certified/ attested by Company Secretary/ C.A. in respect of the signing authority of QCA and Generator(s).

In case of QCA, following documents are also required in addition to the aforementioned documents:-

e. Consent letters from all the pool generators connected to the respective pooling station and beneficiary (ies). A proforma consent letter attached as **Annexure-V**.
f. CA audited balance sheets/Financial Statements/Audit reports of the previous year showing net worth of QCA.
g. Experience certificates in respect of Sr.no. 6 (iii) & (iv) above.

Note: All the photocopies supplied along with the application shall be self-attested by authorized signatory.

v. All applications for registration complete in all respects , shall be submitted in the following office: -

Chief Engineer/SLDC, PSTCL
SLDC Building, 220KV Sub Station, Ablowal,
Patiala-147001. (E-mail:"ce-sldc@pstcl.org")

vi. The time period for registration of Stand-alone generator/ QCA shall be (15) working days from the date of receipt of all the documents & information complete in all respect by SLDC.

vii. Within one week from the date of registration, Bank Guarantee of Rs. 20,000/- (Twenty Thousand Rupees only) per MW for Solar Generation and Rs. 50,000/- (Fifty Thousand Rupees only) per MW for Wind Generation towards payment security shall be submitted by the Stand-alone generator/ QCA .The same shall be initially valid for 2 years and revalidated/ recouped as per requirement from time to time.

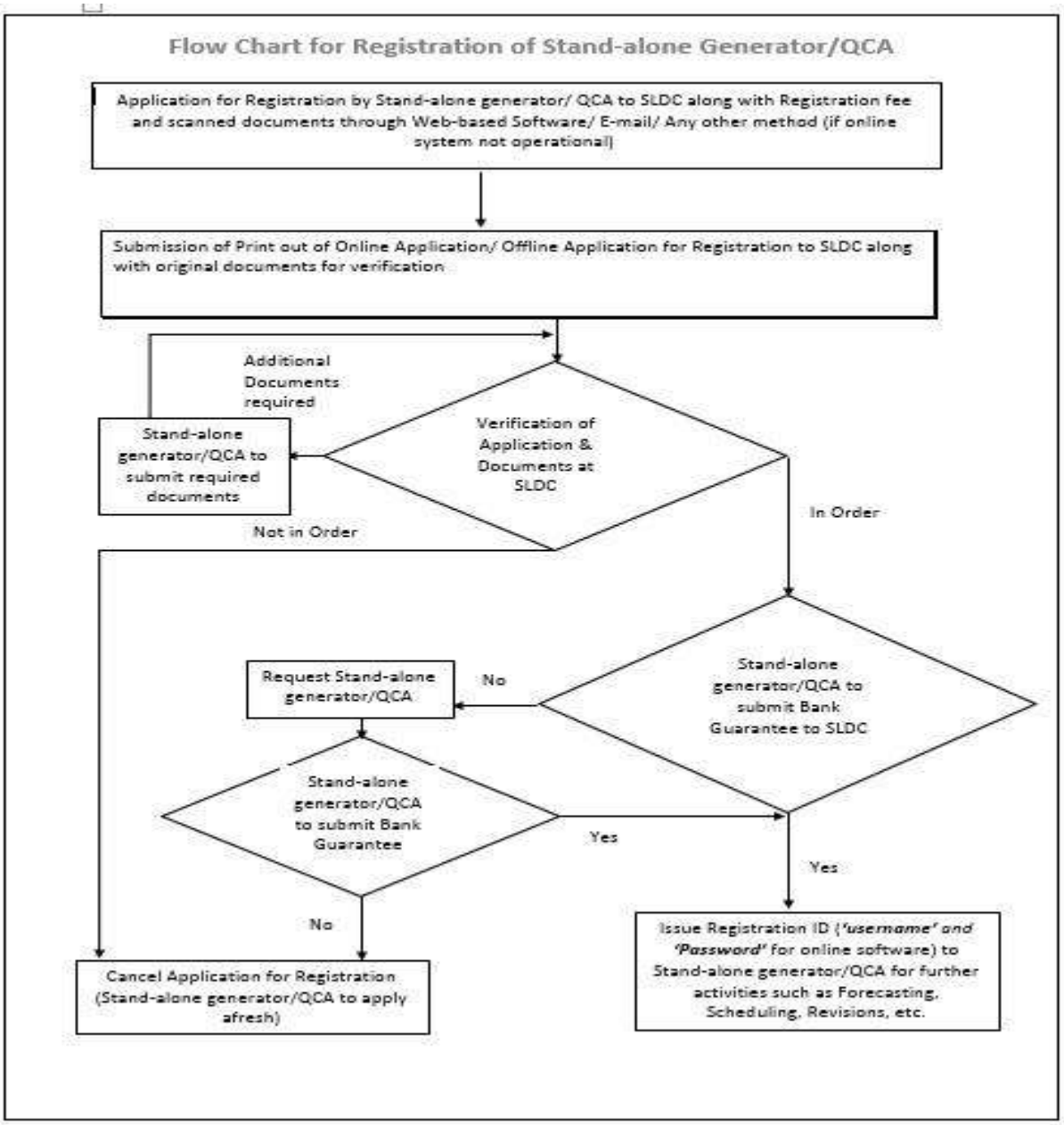
If the Stand-alone generator/ QCA fails to pay deviation charges within Sixty (60) days from the issue of the accounts and billing, the Bank Guarantee shall be encashed by SLDC.

In case of exhausted Bank Guarantee, Stand-alone generator/ QCA shall reinstate Bank Guarantee within seven (7) days from receipt of such information from SLDC. Failure to reinstate Bank Guarantee within prescribed time limit, the Wind/Solar generation shall not be scheduled.

vii Once the application supplied by Stand-alone generator/ QCA along with the requisite documents is found in order and Bank Guarantee is received, the same may be accepted by the SLDC, and the generator/ QCA may be allowed to schedule power for its constituent generators/pooling stations for which the necessary Registration ID (login ID and password for web-based application) shall be provided by SLDC for accessing the further activities such as uploading of day ahead/weak ahead scheduling/revisions.

viii Incomplete application shall be liable for rejection. The reason for rejection shall be communicated to the applicant.

A flow-chart depicting the process for registration as Stand-alone generator/ QCA is given below:-



9.2. De-Registration as a Stand-alone Generator/ QCA:

Case - 1: Own De-registration of QCA:

i. The **QCA** may request SLDC for de-registration as **QCA**, however, in such case, it shall be the responsibility of the **QCA** to settle all the commercial obligations of SLDC. QCA shall also settle all the commercial obligations of Pool Generators whom it is representing.

ii. The QCA shall serve three (3) months prior notice to all the pool generators whom it is representing for de-registration with a copy to SLDC.

iii. The pool generator(s) shall be responsible for appointing a new QCA and ensure registration of new QCA at SLDC within this notice period, failing which generation shall not be scheduled. Provided that a pool generator shall have the option to act as Stand-alone generator subject to fulfillment of conditions laid down in this procedure.

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

iv. Three (3) months prior notice to be served by the pool generator to the QCA for non-authorization with copy to SLDC, subject to Clause No. 5 (i).

v. The pool generator(s) shall be responsible for appointing new QCA and ensure registration of new QCA at SLDC within this notice period, failig which generation shall not be scheduled. Provided that a pool generator shall have the option to act as Stand-alone generator subject to fulfillment of conditions laid down in this procedure.

vi. Before de-registration, the pool generator(s) shall ensure that all the commercial settlements pertaining to it has been completed by the QCA with SLDC.

Case - 3: De-registration of Stand-alone generator/ QCA under default condition:

vii, The SLDC shall initiate the process of de-registration, if the condition(s) as per Clause No. 4 are violated by the Stand-alone generator or condition(s) as per Clause No. 7 are violated by the QCA.

viii. The SLDC shall initiate the process of de-registration, in case of default conditions mentioned at Clause No. 16(i).

ix. In such case, the process of de-registration shall be initiated as per Clause No. 16 (ii).

x. The pool generator(s) at a pooling station shall be responsible for appointing new QCA and ensure registration of new QCA at SLDC within this notice period, post which generation shall not be scheduled.

10. Data & communication protocol:-

In view of the large volume of information needed to be exchanged in a time bound manner, the transfer of information e.g. technical/ static data, forecast, Available Capacity, Schedule etc. between SLDC and QCA/ Stand-alone Generator shall be through internet only. However, in case of contingencies like internet failure etc., the transfer of information may be communicated through alternate mode i.e., fax/telephone on request of SLDC/ QCA/ Generator.

Real Time Data from the turbine/inverter level to the Interface Point (Generator/ Pooling Station) and from Interface Point to SLDC shall be provided by Stand-alone Generators/ QCA (including necessary interfacing arrangements for data integration at SLDC end). The Real

Time data shall be transmitted upto SLDC through IEC: 101/104 protocol by providing a redundant (main & backup) communication link/ connectivity using any mode of communication e.g. Optical Fibre/PLCC/MPLS/RF/GPRS or any other latest technology available, which shall be provided and maintained by the Stand-alone Generators/ QCA. Further, main and backup communication links shall preferably be either through different communication modes or from different service providers (if same communication mode is used).

The communication network i.e. PLCC/ Optical Fibre from PSTCL sub-stations to SLDC in Punjab is to be provided by STU (PSTCL) for telemetry of real time data upto SLDC.

Generators/ QCA shall follow the provisions of CERC (Communication Systems for Inter-State Transmission of Electricity) Regulations, 2017, as amended from time to time and technical standards, protocols for communication system etc. notified by CEA under aforesaid CERC Regulations for Communication Infrastructure to be used for data communication and tele-protection of power system and shall ensure the correctness of the real-time data.

The requirements for data visibility and interfacing requirements at SLDC are detailed out in **Annexure- II.**

11. Available Capacity (AvC):

i. It is mandatory for a Stand-alone generator/ QCA to declare the block wise AvC for generator/ pooling station. The AvC shall be declared on day ahead basis and can be revised during the submission of intra-day schedules.

ii. The Available Capacity (AvC) for a wind generating plant shall be applicable for the entire 24 hours in a day. Whereas considering the availability of solar irradiation only during the day, the AvC for solar generating plants shall be applicable only between 05:30 AM till 19:30 PM. **Plants having mixed capacity of wind and solar generation shall consider the AvC accordingly (by adding the wind and solar generation AvC during the period of 05:30 AM to 19:30 PM and only wind generation AvC for the balance period).**

12. Forecasting & Scheduling Procedures:

i. Wind and solar generators, either by themselves or represented by QCAs, shall mandatorily provide to the SLDC, in a format attached (Annexure-IA, IB & IC), the technical specifications of the generating units and all other associated equipment of wind/solar generator at the beginning and thereafter, whenever there is any change in such technical specifications. The data relating to the power generation parameters and

weather related data, as applicable, shall also be mandatorily provided by such generators or QCA appointed by it, to the SLDC in real time.

ii. Forecasting shall be done by every wind and solar generator connected to the Grid, either by itself or by a Qualified Coordinating Agency (QCA) on their behalf. Forecasting of wind and solar power that is expected to be injected into the state grid shall also be done by SLDC with the objective of ensuring secured Grid operation by planning for requisite balancing resources by engaging forecasting agency (ies), if required. The forecast by a wind or solar generator or QCA, as the case may be, shall be generator centric. The wind or solar generator or QCA will have the option of accepting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast. In such case of QCA/ Stand-alone generators adopting forecast provided by SLDC, charges amounting to Rs. 3,000/- per Pooling Station/ Stand-alone generator per day, shall be paid by the QCA/ Stand-alone generator to SLDC. The QCA shall coordinate the aggregation of schedules of all its generators connected to a pooling station and communicate the same to the SLDC.

iii) The existing wind and solar generators or QCA on their behalf shall establish the forecasting tools and furnish day ahead, week-ahead forecasting and scheduling to SLDC w.e.f 01.01.2020. However, all new wind and solar generators or QCA on their behalf shall establish the forecasting tools before commissioning of the plant and connecting to the State Transmission System or Distribution system, as the case may be .

iii. Every wind and solar generator or a QCA shall submit a day ahead and week ahead schedule for each generating station or each pooling station on ex-bus basis, as the case may be **(Annexure-III)** in line with the provisions of State Grid Code**.** Day ahead schedule shall contain wind or solar energy generation schedule at intervals of fifteen (15) minutes time-block for next day, starting from 00.00 hours of the day and prepared for all ninety six (96) time blocks of the day. Week-ahead schedule shall contain the same information for next seven days. The week will commence from Monday.

iv. The forecast/ schedules shall be in MW up three Decimal places. The fourth Decimal place shall be rounded off to 3rd Decimal place as per standard practice. Deviation Volume and Value shall be calculated accordingly**.**

v. The schedule of wind and solar generators connected to the State Grid, excluding collective transactions, may be revised by giving advance notice to SLDC. Such revisions shall be effective from fourth (4th) time block, the first being the time-block in which notice was given **(Annexure-VII).** There may be one revision for each time slot of one and

half hours starting from 00.00 hours of particular day subject to maximum of sixteen (16) revisions during the day.

vi. Process for submission of a day ahead Forecast for Intra-State Transactions shall be as per the provisions of State Grid Code read with the provisions of the Regulations.

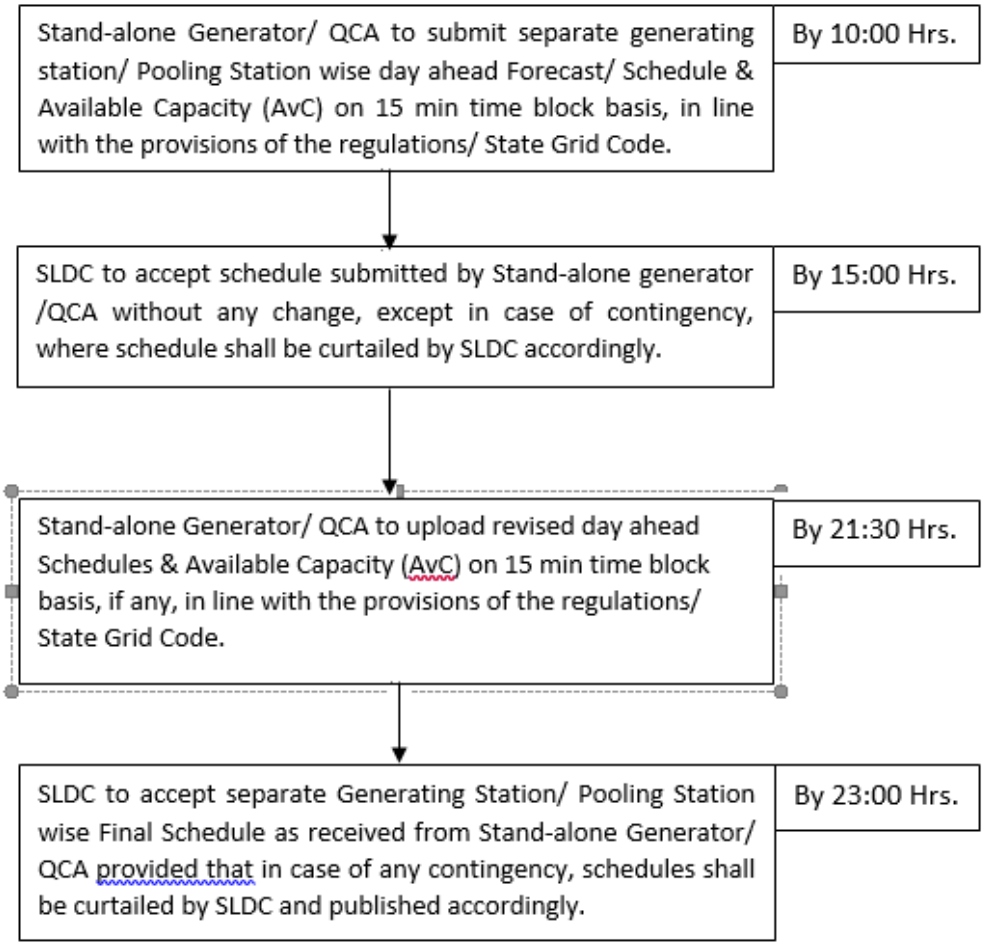
vii. Until start of Web Based Scheduling, the schedule will be supplied in soft copy (Scanned copy of duly signed hard copy (PDF/ JPEG format) and soft copy in excel) through e-mail and the receipt/ time of receipt of schedule shall be got confirmed from SLDC on telephone. SLDC shall also maintain record of such receipt of schedule in log books. Similar record will be maintained by QCA/ RE generator.

viii. It shall be incumbent upon the RE Generator or QCA as the case may be to schedule plant capabilities faithfully, i.e., according to their best assessment. Any intentional mis-declaration of Available Capacity or schedule to the SLDC for its own undue commercial gain through deviation charges or that of a generator shall be considered as gaming and shall be liable to action under appropriate provisions of the Act or the Regulations.

ix. The operating & maintenance log books of the generating station shall be available for inspection/review by the SLDC. These books shall keep record of machine operation and maintenance.

x. The schedules provided by the QCA/ generator(s) shall be accepted by SLDC without any revision (being must-run generating stations) except in case of real time curtailment Such schedules in respect of all RE Generators shall be collectively uploaded on Punjab SLDC website.

xi. The Revision No. shall start from -1 (for first AvC/ Schedule to be submitted by 10:00 Hrs of preceding day as per the provisions of State Grid Code) and will be increased step-by-step as 0, 1, 2, 3……n (for subsequent revisions), subject to the condition that QCA/ generator(s) may inform the modifications / changes to be made, if any, in the AvC/ Schedule to SLDC latest by 21:30 hours of preceding day as per the provisions of State Grid Code. **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.

xii. The last/ final (nth) revision shall be considered as Implemented schedule by SLDC for preparation of State Energy Account & deviation account.

xiii. In case the schedule of a generator/QCA for the next day is not received by the specified time, SLDC shall prepare the same on its behalf based on the previous day schedule/ net quantum tied-up for injection under PPA.

xiv. In the event of contingencies, transmission constraints, congestion in network, threat to system security, the transaction of RE generators already scheduled by SLDC may be curtailed as per the provisions of State Grid Code for ensuring secure and reliable system operation **(Annexure-VIII).**

xv. If, at any point of time, SLDC observes that there is need for revision of the schedules in the interest of better system operation, it may do so on its own and in such cases, the revised schedules shall become effective from the 4th time block, counting the time block in which the revised schedule is issued by SLDC to be the first one.

xvi. To discourage frivolous revisions, SLDC may, at its sole discretion, refuse to accept requisition schedule/ **availability** changes of less than two (2) percent of previous schedule/ **availability**.

xvii. In case of any grid disturbance, the schedule generation of all the generating stations and schedule drawl of the discom shall be deemed to have been revised to be equal to their actual generation/drawl for all the time blocks affected by the grid disturbance and its duration shall be done by SLDC.

xviii. Generation schedules and drawal schedules issued/revised by SLDC shall become effective from designated time block irrespective of communication success.

xix. RE Generators shall promptly inform SLDC of the tripping of a Generating Unit, with reasons & shall submit a more detailed report of Generating Unit tripping to SLDC on monthly basis.

xx. SLDC 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 provisions of the Regulations. However, in case of Intra and Inter-State transactions, separate feeder wise forecast (for Intra & Inter-State) shall be submitted by the QCA/ Stand-alone generator. In such case, SLDC shall separately schedule the power accordingly.

xxi. The final/ implemented schedules issued by SLDC shall be open to all Users for any checking / verification, for a period of 7 days. In case any mistake / omission is detected by SLDC or pointed out by User (PSPCL/QCA/generator), the SLDC shall forthwith make a complete check and rectify the same, if required.

xxii. Intra-State Open Access transactions by RE generators shall be governed as per the provisions of PSERC (Terms & Conditions for Intra-State Open Access) Regulations, 2011, as amended from time to time. Similarly Inter-State Open Access transactions by generators shall be governed as per the provisions of CERC (Open Access in Inter-State Transmission) Regulations, 2008, as amended from time to time. Provisions of PSERC

(Harnessing of Captive Power Generation) Regulations, 2009 shall also be applicable for captive use of RE generation.

13. Metering Requirement:

i. Concerned RE Generators shall be responsible for providing required metering equipment along with specified communication facilities for the purpose of proper Energy Accounting in line with State Grid Code requirement and alongwith Automated Meter Reading (AMR) system for communicating and integrating meter data at SLDC. Internal clock of the interface meter shall be time synchronised with GPS. The metering equipment, metering protocol, AMR system and associated communication facilities shall comply with CEA metering regulations, as amended from time to time, CEA "Functional Requirement of Advanced Metering Infrastructure (AMI)" read along with the provisions in SAMAST report endorsed by Forum of Regulators (FoR).

ii. The Interface meters (ABT compliant Main & Check Meters) at Outgoing feeder at generator end shall be provided by the generators in coordination with field offices of concerned licensee (PSPCL/ PSTCL). The ABT compliant Standby meters at grid sub-station end shall be provided by the concerned licensee (owner of sub-station i.e. PSPCL/PSTCL, as the case may be).

In case of existing RE generators, the metering system at generator end alongwith associated AMR system shall be provided & installed by STU (PSTCL) under SAMAST scheme based on PSDF funding.

However new RE generators shall be responsible for providing metering system alongwith associated AMR & communication system (compliant to the provisions of SAMAST report) for integrating meter data at SLDC.

Concerned licensee (PSPCL/ PSTCL) shall be responsible for installation, testing, commissioning, maintenance, sealing, rectification & replacement of metering equipment and data downloading. However the cost of such activities shall be borne by the concerned generators. Further, all the recurring charges of metering and communication system at generator end (included rentals etc.) in case of both existing as well as new generators shall be borne by the concerned generators.

iii. The AMR system at SLDC end is expected to be made functional within one year after issue of funding by PSDF under SAMAST scheme.

iv. In case the pooling station is a sub-station owned by generator(s) or QCA, the interface meters shall be installed (ABT main & check meters) at the HV side of the pooling station's ex-bus, whereas if the Pooling Station is a sub-station owned by licensee (PSPCL/ PSTCL), the interface metering shall be done at the individual outgoing feeder(s) of each generator at the LV side of the sub-station of the licensee.

Guidelines regarding change in metering point location can be issued as per the prevailing CEA metering Regulations/ Punjab State Grid Code, as amended from time to time.

v. Concerned field offices of licensee (PSPCL/ PSTCL) shall be responsible for time to time monitoring, checking/ testing of metering equipment and GPS time synchronization, thus ensuring health of the metering equipment & correctness of ABT data. The detection and Correction of Real Time Clock (RTC) time drift of interface meters shall be done by the concerned field offices of the licensee as per the approved procedures.

In case of Solar/ Wind Generators directly connected to the Intra-state transmission system and selling power to 3rd party under open access or wheeling power for captive use, the concerned Sr.Xen/ P&M of PSTCL shall be responsible for checking/ testing of metering equipment, detection and Correction of Real Time Clock (RTC) time drift in coordination with the concerned field officers of PSPCL (Sr.Xen/ DS/ MMTS). Provisions of PSERC (Terms & Conditions for Intra-State Open Access Regulations), 2011, as amended from time to time and Intra State Open Access Procedures approved by PSERC shall also be applicable in such cases.

vi. In case of any problem or reported defect/fault in metering equipment, the matter shall be referred to the concerned field office of PSPCL/ PSTCL, as the case may be, which will investigate and take up the matter with concerned Nodal Officer of PSPCL (PP&R). If required, RE Generators shall refer/take-up the matter in the Protection Co-ordination Committee (PCC), depending upon the nature of issue. In case of any defect/ change in metering equipment, SLDC shall be intimated immediately.

vii. In case of non-availability of Interface Meters data and/or defect in interface metering equipment (ABT Main & Check Meters/ CT/PT at Interface Point), the data recorded by Standby meters shall be considered for accounting purposes during the period of defect. In case of non-availability of both interface Meters' data as well as standby Meter data and/or defect in both the interface metering equipment and Standby meter, accounting shall be done based on historical trends and/or as per the decision of Commercial & Metering Committee (CMC) after hearing all the affected parties.

14. Energy Accounting & Deviation Settlement:

i. The day-wise energy scheduled as per implemented schedules shall form a part of State Energy Account. Monthly provisional State Energy Account (SEA) up to 25th of month will be issued by SLDC by last day of the month which will be uploaded on Punjab SLDC website for any comments/ objections/corrections. The provisional SEA will be followed by Final SEA, to be issued by 7th day of succeeding month. SLDC will be authorized to revise the Provisional as well as Final Energy Account.

ii. Monthly State Energy accounts for Punjab prepared by SLDC shall be uploaded on SLDC website, for raising bills by all concerned. Such energy accounts shall be subject to inspection/ verification/checking and raising any objection within 15 days of date of issue. If no objection is raised, energy accounts shall be considered finalized. In case, any objection is raised, the energy accounts shall be revised after checking, if required . However the disputed matters shall be deliberated in Commercial and Metering Committee and finalized as per their decision. Supplementary bills/credit note shall also be raised accordingly.

iii. The Deviation accounting shall be undertaken on the basis of the data recorded by the Interface Meters , capable of recording the energy in 15-minute time blocks or less, as may be specified. Automated Meter Reading (AMR) system shall be used for communicating data/ remote downloading of data at SLDC. Internal clock of the interface meter shall be time synchronized with GPS. Besides, downloaded meter data readings shall also be forwarded to the SLDC.

iv. The DSM account for Generators/ Pooling Stations shall be in line with the provisions of PSERC (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019, as amended from time to time. Similarly, Reactive Energy Accounts shall be prepared in line with provisions of State Grid Code/ IEGC.

v. **Weekly Energy Accounting and Deviation Settlement in accordance with Regulation 8 of the Regulations, (to be operationalized after implementation of Automated Meter Reading (AMR) as per the recommendation of SAMAST):-**

a. **By 00:00 hours on every Thursday**, the Stand-alone generator/ QCA shall furnish weekly meter readings of generators /Pooling Station, as the case may be, of he previous week starting from Monday 00:00 hrs to Sunday 24:00 Hrs, to the SLDC,

in addition to the data provided to the Supervisory Data and Control Acquisition (SCADA) Centre, for the purpose of energy accounting under the Regulations.

b. SLDC shall process the data provided by all the Stand-alone generator's/QCAs' and prepare the weekly Energy Account Statement (for declared available capacity, scheduled energy and actual energy injected by the RE generator(s)) and weekly DSM account for the Pooling Station or the stand-alone Generator, as the case may be,, **by 24:00 hours of next Tuesday**, which shall be uploaded on SLDC website. The QCA/ Stand-alone generator may raise weekly bills, for the energy injected/ scheduled by Pooling Station or the stand-alone Generator, as the case may be, for Intra-State/ Inter-State transactions respectively in accordance with the regulations and PPA.

c. The QCA/ RE Generator, as the case may be, shall communicate any discrepancies to SLDC within 15 days of issue of accounts, which shall be corrected forthwith by SLDC , if required, within 7 days from date of receipt of such discrepancy. The discrepancies reported after 15 days shall not be considered by SLDC and in such case, the account prepared by SLDC shall be final.

d. The Deviation Charges payable/receivable for the State as a whole at State periphery (say D), as computed by NRPC in weekly Deviation Settlement Accounts of the State, shall be allocated by SLDC amongst the distribution licensee/OA consumers/conventional generators/RE generators (pooling station) in proportion to their respective deviation.

e. SLDC shall compute the absolute error for each Pooling Stations and for Generators (with capacity more than 5 MW) injecting Power individually, and shall calculate the deviation charges in accordance with Regulation 6 of the regulations (say R1). The % error shall be calculated on the basis of available capacity and deviation as actual - schedule and shall be calculated by rounding up to second decimal place.

f. SLDC shall determine the impact of deviation of Wind & Solar injection at Pooling Station and its contribution on the total deviation charges at the State periphery as per NRPC weekly DSM accounts by forming a virtual pool of all Pooling Stations and Stand-alone Generators (assuming the share of the State level deviation charges for RE generators as D4).

g. The actual commercial impact for the State as a result of deviation of RE generation shall be D4-R1. At the end of the year, if this amount is greater than zero, the same can be

refunded to the State Pool Account from PSDF/NCEF or from the alternative funding mechanism, as may be approved by the Commission.

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

The following criteria/ methodology shall be adopted by SLDC for preparation of DSM account in case of Intra State transactions by RE generators:-

1) Charges towards sale of Energy shall be settled by the Procurer on the basis of actual generation, whereas the charges towards deviation of Energy from its given schedule shall be settled by the Generator in line with Regulation 6.1 (ii) (Table-I) of the Regulations.

Illustrative example for calculation of deviation for five Pooling Stations/ Stand-alone Generators in case of Intra-State transaction is given at **Table - 1A** below:-

Table-1 A

Pooling Station/ Generator wise deviation charge calculation for Intra-State Transactions (for One Time block)										
Pooling Station/ Individual Generator	Available Capacity (kWh)	Schedule (kWh)	Actual Injection (kWh)	Deviation (kWh)	Absolute Error (%)	Deviation Units apportioned on the basis of Absolute Error (kWh)				Deviation Charges payable by individual Pooling Station/ Generator (Rs.)
						Upto 15%	15 to 25%	25 to 35%	>35%	
	(A)	(B)	(C)	(D) = C-B	(E) = Dx100/A	(F)	(G)	(H)	(I)	(J) = 0xF+0.5xG+ 1xH+1.5xI
P.S.-1	35000	25000	32500	7500	21.43%	5250	2250	0	0	2250x0.5 =1125
P.S.-2	80000	50000	52500	2500	3.13%	2500	0	0	0	0
P.S.-3	120000	75000	90000	15000	12.50%	15000	0	0	0	0
G-1	90000	50000	47500	-2500	-2.78%	2500	0	0	0	0
G-2	55000	37500	20000	-17500	-31.82%	8250	5500	3750	0	5500x0.5+3750 =6500
Total	**380000**	**237500**	**242500**	**ABS 45000**	**11.84%**					**7625**
Net Exchange	380000	237500	242500	5000						

2) To determine the impact of RE deviation at State periphery, the part of DSM weekly bill issued by the NRPC shall be apportioned to the net deviation of RE generation on the basis of applicable composite per unit rate (inclusive of additional DSM or capping DSM charge) for particular time block, as detailed hereunder via example:-

- Net Deviation of RE generation at State Periphery : 5000 kWh
- Avg. Deviation rate at State periphery : Rs.3.00/- per kWh
- Total Deviation Charges on account of RE deviation at State periphery (D4) : Rs. 15,000/-
- Total Deviation Charges collected from RE generators as per Regulations (R1) : Rs. 7,625/-
- Shortfall of deviation charges on account of RE generators (D4-R1) : Rs. 7,375/-

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

Following criteria/ methodology shall be adopted by SLDC for preparation of DSM account in case of Inter State transactions by RE generators:-

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

2) The Generator(s), through the QCA, shall submit a separate Schedule for its energy injection at Pooling Station, in accordance with these Regulations, to the SLDCs.

3) The Inter-State Schedule submitted by the Stand-alone generator/ QCA shall be grossed-up to State Periphery by applicable transmission losses at par with conventional procedures and further shall be forwarded to Regional Load Despatch Centre (RLDC) to in-corporate in the State drawl schedule.

4) Charges towards sale of Energy shall be settled by the Procurer on the basis of scheduled generation, whereas the charges towards deviation of Energy from its given schedule shall be settled by the Generator in line with Regulation 6.2 (Table-II & III at Appendix-I) of the Regulations *(subject to the conditions specified by CERC in CERC(Deviation Settlement Mechanism & related matters) Regulations, 2014, as amended from time to time),* as explained at **Table-2A** below:-

Table-2 A

Pooling Station/ Generator wise deviation charge calculation for Inter-State Transactions (for One Time block)

Pooling Station/ Individual Generator	Available Capacity (kWh)	Schedule (kWh)	Actual Injection (kWh)	Deviation (kWh)	Absolute Error (%)	Deviation Units apportioned on the basis of Absolute Error (kWh)				Deviation Charges payable(+)/ receivable(-) by individual Pooling Station/ Generator, considering PPA rate/APPC @ ₹ 3.53 per kWh (₹)
						Upto 15%	15 to 25%	25 to 35%	>35%	
	(A)	(B)	(C)	(D) =I-B	(E) = Dx100/A	(F)	(G)	(H)	(I)	(j) = 3.53xF+ 1.1x3.53xG+ 1.2x3.53xH+ 1.3x3.53xI (For Under-Injection 3.53xF+0.9x3.53xG +0.8x3.53xH +0.7x3.53xI (For Over-Injection)
P.S.-1	35000	25000	32500	7500	21.43%	5250	2250	0	0	**-25681**
P.S.-2	80000	50000	52500	2500	3.13%	2500	0	0	0	**-8825**
P.S.-3	120000	75000	90000	15000	12.50%	15000	0	0	0	**-52950**
G-1	90000	50000	47500	-2500	-2.78%	2500	0	0	0	**8825**
G-2	55000	37500	20000	-17500	-31.82%	8250	5500	3750	0	**66364**
Total	**380000**	**237500**	**242500**	**ABS 45000**	**11.84%**					**-12267**
Net Exchang	380000	237500	242500	5000						

5) To determine the impact of RE deviation at State periphery, the part of DSM weekly bill issued by the NRPC shall be apportioned to the net deviation of RE generation on the basis of applicable composite per unit rate (inclusive of additional DSM or capping DSM charge) for particular time block, as detailed hereunder via example:-

- Net Deviation of RE generation at State Periphery : 5000 kWh
- Avg. Deviation rate at State periphery : Rs.3.00/- per kWh
- Total Deviation Charges on account of RE deviation at State periphery (D4) : Rs. 15,000/-

- Total Deviation Charges paid to RE generators as per Regulations (R1) : - Rs. 12,267/-

  Shortfall in deviation charges on acc RE generators (D4-R1) : Rs. 27,267/-

6) The rate for deviation settlement in case of Inter-State transactions shall be based on PPA rates or in case of multiple PPAs, it will be based on Weighted Average PPA Rate, which shall be supplied by the QCA/ Standalone generator on notarized affidavit. The inter-state transactions and their accounting shall be primarily governed by the provisions of Open Access Regulations and Deviation Settlement Mechanism regulations issued by CERC.

j. The SLDC shall provide separate DSM accounts for Inter-State and Intra-State transactions to the QCA/Stand-alone generators. QCA shall settle the Deviation Charges with the concerned Generators.

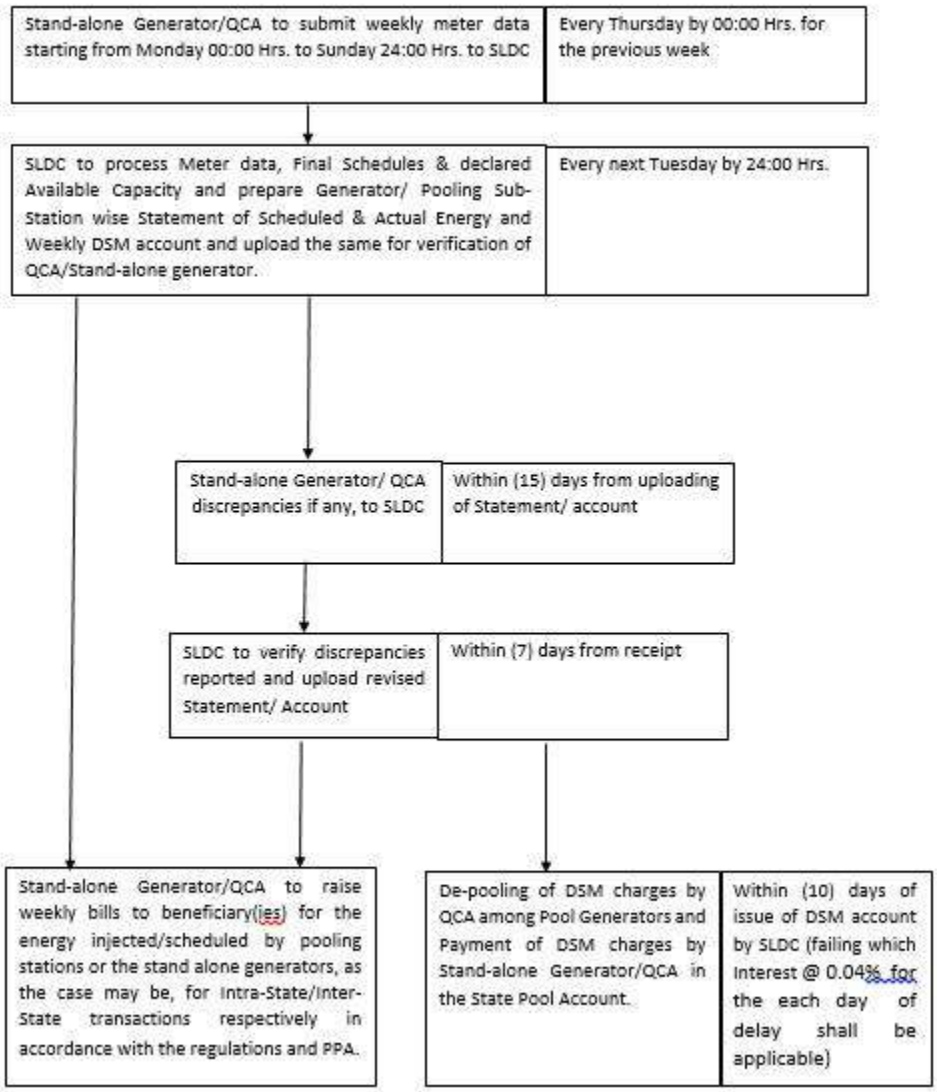
k. Deviations in respect of Inter-State and Intra-State transactions shall be accounted separately at each Pooling Station.

l. After notification of Intra-State DSM Regulations by the Commission, the Deviation Charges payable/receivable by distribution licensee, OA consumers, and conventional generators shall be computed by SLDC in accordance with Intra-State DSM regulations (say D1 be the Total Deviation Charges payable/receivable computed by SLDC) and after receipt of the deviation charges for RE generation in accordance with Regulation 6 of the regulations (say R1), if Deviation charges for the State as a whole (D) is greater than (D1+R1), the differential be made good from the PSDF/NCEF or any alternate funding mechanism as approved by PSERC.

m. Calculation of impact of Wind/Solar generators at State Periphery shall be subject to revision in case the NRPC revises DSM account for concerned week at a later stage.

n. 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.

o. The process-chart pertaining to timelines for accounting by SLDC is summarized as under:-



vi. **Monthly Energy Accounting and Deviation Settlement in accordance with Section 14.1 of the State Grid Code, being operationalized till implementation of Automated Meter Reading (AMR) as per the recommendation of SAMAST:-**

a. For the purpose of preparation of Deviation Settlement Accounts, the joint meter reading(s) of Interface Meters shall be downloaded by concerned field offices **of licensee (PSPCL/ PSTCL)** in presence of representative of Generator, on 1st of every month at interconnection/ interface points. **After duly verification & checking, the data shall be supplied to SLDC (in duly signed hard copy & soft copy)** in person or via. e-mail energyaccounting@punjabsldc.org & se-opac@pstcl.org by 5th of every month or as per the provisions of PPA, whichever is earlier. The readings shall include Load-Survey (15-

min) & Mid-Night (24 Hrs) data of Interface meters (Main Meter & Check Meter) and corresponding data of standby meters.

b. Based on the ABT data received, energy account statement for the actual energy injected by generators and Deviation Settlement Accounts for the month shall be issued by SLDC **by 15th of every month** (subject to receipt of timely data) and uploaded on SLDC website for stand-alone generator/QCAs to raise monthly bills to beneficiary(ies) and for QCA's to depool the DSM charges among the pool generators.

The methodology for preparation of Deviation Settlement accounts for Intra-State as well as Inter-State transactions of Solar & Wind Generators/ Pooling Stations shall be same as elaborated in Sr.No. 14 (v) above. The accounts shall be uploaded on SLDC website. Such energy accounts shall be subject to inspection/ verification/checking and raising any objection within 15 days of date of issue. If no objection is raised, energy accounts shall be considered finalized, or otherwise accounts shall be corrected forthwith by SLDC, if required, within 7 days from date of receipt of such discrepancy.

vii The disputed matters, if any, shall be deliberated in Commercial and Metering Committee and finalized as per their decision.

viii The QCA shall process data for de-pooling among generators to whom it is representing and supply Statement to SLDC for information within 7 days of issue of UI/ DSM account bC.

15. Deviation Charges Payment Mechanism:

i All the commercial transactions shall be through Electronic Clearance System (ECS) only.

ii The Stand-alone Generator/ QCA shall open Bank Account in any Bank registered and regulated by RBI and intimate the details of the same to SLDC.

iii The Deviation Charges shall be paid by the Stand-alone Generator/ QCA within ten (10) days from the issue of the accounts by the SLDC.

iv If the Stand-alone Generator/ QCA fails to pay charges within 12 days from the date of issue of DSM account by SLDC, the defaulting generator/ QCA shall pay simple interest @ 0.04% for the each day of delay.

v The QCA shall pay the Deviation Charges to SLDC and collect it from the concerned Generators in proportion to their actual generation.

vi All payments to the State Entities on account of charges for deviation shall be made within 2 working days of receipt of the payments in State Pool account.

vii The responsibility of ensuring the payment of the Deviation Charges to the SLDC by

the QCA shall remain to that of the concerned Generators.

viii After successful registration of the Stand-alone Generator/QCA, it shall be the responsibility of the Stand-alone Generator/QCA to deposit Bank Guarantee to ensure payment security mechanism.

16. Mechanism For Ensuring Compliance

In the Event of breach or default of procedure and consequences thereof shall be as under:

i. Following events shall constitute breach by QCA/ Generators:

a. Non-payment or delay in payment of Deviation Charges.
b. Non-compliance of any of the terms & conditions/ rules outlined under this procedure.
c. Non-compliance of any of the directive issued by SLDC, so long as such directives are not inconsistent with any of the provisions of PSERC (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations 2019.
d. Obtaining registration on the basis of false information or by suppressing material information.
e. Generator or QCA fails to provide schedules for continuously for 10 days.
f. Non-availability of real time data continuously for three (3) days without justified reason.
g. In case the Available Capacity (AvC) is intentionally and repeatedly mis-declared by the Generator/ QCA.
h. Non-payment of RE DSM charges to RE DSM Pool by Generator/QCA for consecutive three (3) weeks.
i. In case the Generator/QCA has become insolvent/ bankrupt.
j. In case of continued default for statutory compliance leading to declaratiillfulf wilful defaulter by Competent Authority

ii. Consequences for event of default:

a. If schedule is not provided by the generator/QCA then the previous day's schedule 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 SLDC's ARR approved by Hon'ble PSERC as amended from time to time.

b. In case of default, the SLDC shall issue a notice of period not less than 15 days for revocation of registration of Stand-alone Generator/QCA, non-scheduling of

generator/ Pooling Station and disconnection from the grid and adequate opportunity to Generator/ QCA to present its case before SLDC.

In case QCA/Generator fails to address/rectify the breach expressed by the SLDC in the Notice within stipulated time, the SLDC shall proceed with revocation of registration of QCA/ Generator and disconnection form grid. The Bank Guarantee may be forfeited in such case and the QCA/ Generator may also be debarred for a period of 2 years.

17. SLDC Fees & Charges and other Charges:

SLDC fee and charges including scheduling and operating charges shall be payable by QCA or generator, as the case may be, as specified/decided by the Punjab state Electricity Regulatory Commission. The other Charges shall be levied as per the applicable PSERC Regulations/Orders. Details of Registration Fee, Forecasting fee, Schedule Revision Charges and Bank Guarantee enclosed at **Annexure-IX** (which shall be levied subject to approval of Hon'ble PSERC).

The payment/ billing of charges shall be in accordance with the relevant regulations (e.g. forecasting, scheduling & DSM regulations, open access regulations etc.) issued by Hon'ble PSERC from time to time.

18. Application of Losses and Charges:

Transmission and Distribution charges and losses shall be applicable as specified by the PSERC/ CERC from time to time.

19. Re-dressal Menism:

Any dispute in scheduling, metering, billing/ energy accounting & Commercial Settlement shall be first referred to the Commercial & Metering Committee (CMC) formulated under State Grid Code. All users shall abide by the decision of CMC. The Committee shall investigate and endeavor to resolve the grievance within 30 days after affording opportunity of hearing to all the affected parties. If the Committee is unable to redress the grievance, it shall be referred to the Commission by the Committee . In case the generator/ QCA is dissatisfied with the decision of the committee, it may approach the Commission through a petition. Pending the decision of the commission, the directions of the SLDC shall be complied with by the GeneratorQCA

20. Removal of difficulties:

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

21. General:

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

ii. The Generators and QCA shall abide by the provisions of the Electricity Act, 2003, the PSERC Regulations and Indian Electricity Grid Code and PSERC (State Grid Code) Regulation - 2013, and applicable CERC and PSERC regulations as amended from time to time.

iii. 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 SLDC with prior approval of Commission.

iv. After approval of procedure by Hon'ble PSERC, SLDC shall undertake development of software for RE DSM after issue of PSDF funding under SAMAST scheme and after go-live of RE DSM software there shall be trial run period of atleast (8) weeks for ensuring implementation of RE DSM as envisaged in the regulation. Actual commercial settlement shall commence from the date as may be decided by the Commission.

22. Annexures & Formats:

List of Annexures and Formats are listed below:

Sr.No.	Particulars	Annexure/ Format No.
1.	Technical Data of individual Generators	
(a)	For Wind Generators	Annexure - I A
(b)	For Solar Generators	Annexure - I B
(c)	For Pooling Stations	Annexure - I C
2.	Real-time Data Telemetry requirement	Annexure - II
3.	Format for submission of Forecast/ Schedule	Annexure - III
4.	Notarized Affidavit/ Undertakings on Stamp Paper	
(a)	PPA details of individual pool Generators in the Pooling Station	Annexure - IV A
(b)	Format for Indemnity Bond to be submitted by Stand-alone generator/ QCA	Annexure - IV B
5.	Consent/Authorization Letter from Pool Generators & beneficiary for appointment of QCA	Annexure-V
6.	Application for Registration of Stand-alone generator/ QCA	Annexure - VI
7.	Format for revision of Forecast/ Schedule	Annexure - VII
8.	Format for curtailment of Forecast/ Schedule by SLDC	Annexure - VIII
9.	Proposed Fee & Charges	Annexure - IX

Annexure-I A

Proforma for static data for wind turbine generating plants

S. No.	Particulars
1	Type
2	Manufacturer
3	Make
4	Model
5	Capacity
6	Commissioned date
7	Hub height
8	Total height
9	RPM range
10	Rated wind speed
11	Performance Parameter
12	Rated electrical power at Rated wind speed
13	Cut in speed
14	Cut out Speed
15	Survival speed {Max wind speed)
16	Ambient temperature for out of operation
17	Ambient temperature for in operation
18	Survival temperature
19	Low Voltage Ride Through (LVRT) setting
20	High Voltage Ride Through (HVRT) setting
21	Lightning strength (KA & in coulombs).
22	Noise power level (db)
23	Rotor
24	Hub type
25	Rotor diameter
26	Number of blades
27	Area swept by blades
28	Rated rotational speed
29	Rotational Direction
30	Coning angle
31	Tilting angle
32	Design tip speed ratio
33	Blade
	(i) Length

(ii) Diameter
(iii) Material
(iv) Twist angle

38 Generator
(i) Generator Type
(ii) Generator no. of poles
(iii) Generator speed
(iv) Winding type
(v) Rated Gen. Voltage
(vi) Rated Gen. Frequency
(vii) Generator current
(viii) Rated Temperature of generator
(ix) Generator cooling
(x) Generator power factor
(xi) KW /MW@ Rated Wind speed
(xii) KW /MW@ peak continuous

51 Frequency Converter
52 Filter generator side
53 Filter grid side
54 Transformer
(i) Transformer capacity
(ii) Transformer cooling type
(iii) Voltage
(iv) Winding configuration

59 Weight
(i) Rotor weight
(ii) Nacelle weight
(iii) Tower weight

63 Over speed Protection
64 Design Life
65 Design Standard
66 Latitude
67 Longitude
68 COD Details
69 Past Generation History from the COD to the date on which DAS facility provided at SLDC, if applicable
70 Distance above mean sea level
71 Electrical Single Line Diagram and Plant Layout

72 Any other data required from time to time

Note: Any change in aforementioned data/ information shall be conveyed to SLDC immediately.

Sign & Stamp of Authorized Signatory of QCA/ Generator(s)

Annexure-I B

Proforma for Static data for Solar generating -Plants

1. Latitude
2. Longitude
3. Inverter Power Curve
4. Elevation and orientation angles of arrays or concentrators
5. The generation capacity of the Generating Facility
6. Distance above mean sea level etc.
7. COD details
8. Rated voltage
9. Details of Type of Mounting: (Tracking Technology If used, single axis or dual axis, auto or manual)
10. Manufacturer and Model (of Important Components, Such as Turbine, Concentrators, Inverter, Cable, PV Module, Transformer, Cables)
11. DC installed Capacity
12. Module Cell Technology
13. I-V Characteristic of the Module
14. Inverter rating at different temperature
15. Inverter Efficiency Curve
16. Transformer Capacity & Rating; evacuation voltage, distance form injection point
17. Any other data required from time to time

Note: Any change in aforementioned data/ information shall be conveyed to SLDC immediately.

Sign & Stamp of Authorized Signatory of QCA/ Generator(s)

Annexure-I C

Proforma for Technical Data for Pooling Stations:-

WIND/SOLAR (400/220/132/66/33 kV GSS)

Sr.No.	Name of Receiving Station	Name of Company	Wind/Solar capacity in MW

Note: Any change in aforementioned data/ information shall be conveyed to SLDC immediately.

Sign & Stamp of Authorized Signatory of QCA/ Generator(s)

Annexure-II

Detailed Information/Guidelines for Integration of Sub-station data including RES (Renewable Energy Sources) **plants data (i.e. solar power, wind power etc.) with SCADA system at Punjab SLDC, Patiala.**

Integration of data with SLDC system involves termination of Field Signals, such as RTUs (Remote Terminal Units) at Sub-stations, Solar Power Plants, other control centres etc. in the Communication Front End (CFE) equipment(s) housed in the SLDC Complex which is further connected with the SCADA system. The said SCADA system supports both IEC 60870-5-101 & IEC 60870-5-104 protocols.

The IEC 60870-5-101/104 protocols define two data classes. Class 1 data is used for time tagged or spontaneously transmitted ASDUs. Class 2 data contains periodic, cyclic data.

I. Details of various parameters of protocols used for data communication from field to SCADA system are as under:

i) IEC 101/104 Protocol Parameter Details:

Protocol Id i.e. IEC 870-5-101(Unbalanced) or IEC 870-5-104
Info object address size i.e. 2 or 3 Bytes
Info Object Address Format i.e. Structure
Link and ASDU Address Size i.e. 1 byte Link and 1 byte ASDU for **IEC 101** 0 byte Link and 2 byte ASDU for **IEC 104**
Baud Rate i.e 200 or 300 etc.(for IEC 101 only)
Character Size i.e 8(normal) (for IEC 101 only)
Configuration Type i.e. Point to point (all protocols)
Parity e.g even parity (for IEC 101 only)
Telegram Max Retries i.e. 3
Telegram Time-Out Value i.e. 10 seconds

ii) Valid ASDU data Types for Digital Points/Binary Points:

Type ID 1: M_SP_NA_1 – Single Point Information
Type ID 2 :M_SP_TA_1 – Single-point information with time tag
Type ID 3: M_DP_NA_1 – Double Point Information
Type ID 4: M_DP_TA_1 – Double-point information with time tag
Type ID 30:M_SP_TB_1 – Single point information with time tag CP56Time2a
Type ID 31:M_DP_TB_1 –Double point information with time tag CP56Time2a
Type ID 45 : C_SC_NA_1 – Single Command
Type ID 46 : C_DC_DA_1 – Double Command
Type ID 47 : C_RC_NA_1 – Regulating Step Command.
Type ID 58 : C_SC_TA_1 – Single Command with Time Tag (104 only)
Type ID 59 : C_DC_TA_1 – Double Command with Time Tag (104 only)
Type ID 100: C_IC_NA_1 – (General-) Interrogation command
Type ID 103: C_CS_NA_1 – Clock synchronization command

iii) Valid ASDU data Types for Analog Points :

Type ID 9: M_ME_NA_1 – Measured Value, normalized value
Type ID 11: M_ME_NB_1 – Measured Value, scaled value
Type ID 13: M_ME_NC_1 – Measured Value, short floating point value
Type ID 15: M_IT_NA_1 – Integrated totals

Further, Telegram addresses are provided by the vendor(s)/ RES data integrator(s). Analog Signal address to be started from 8448, Circuit Breaker address from 256 and Isolator address from 376, and Remote Control Addresses to start from 33024 etc.

II. For the purpose of integration of RTUs/SAS/RES data with the said SCADA system, all the concerned are requested to kindly go through the following information/general guidelines as reference. **Before finalising/submitting telemetry scheme to SLDC for approval, the concerned person/system integrator is advised to visit Punjab SLDC,** Near 220KV Grid Sub-station, Ablowal, Patiala **for space requirement for their equipment.**

a) **List of Documents as required for approval** :-

1) Detailed Data telemetry scheme
2) System Architecture
3) Details of tools/software(s) etc. to be used to counter data hacking/cyber-attacks.
4) Data communication route/scheme details
5) Latest Single Line Diagram of Plant/Sub-Station(indicating inverter capacity in MW)
6) Database/telegram addresses of each type of signal(as per details given in Para (B) Below.
7) Test Reports of all hardware to be installed by the firm.
8) Any other document(s) as deemed necessary from time to time

Note : Documents to be submitted should be arranged as per the above order/sequence.

b) Details of Signals (Common for all entities)

1) Analog Signals
   a. **Generating Units/Inverters** : Unit wise Active & Reactive Power (MW & MVAR)
   b. **Lines** : Active & Reactive Power (MW & MVAR)
   c. **Bus Bar**: Voltage (KV)
   d. **Frequency** - Hz.

2) Digital Signals

   a. Circuit Breaker Status (On/Off)
   b. Isolator Status (On/Off)
   c. Sequence of Events
   d. Remote Control of Circuit Breakers (if any)

3) Energy data (KW/KWH)

   a. Import
   b. Export
   c. Net

c) Details of additional Signals (Plant specific only)

(i) For Wind turbine generating plants

1. Turbine Generation (MW/MVAR)
2. Wind Speed (meter/second)
3. Wind Direction (degrees from true north)·
4. Ambient air temperature (°C)
5. Barometric pressure (Pascal)·
6. Relative humidity (in percent)
7. Air Density (kg/m3)

(ii) For Solar generating Plants

1. Global horizontal irradiance (GHI)-Watt per meter square
2. Diffuse Irradiance-Watt per meter square
3. Direct Irradiance- Watt per meter square
4. Sun-rise and sun set timings
5. Performance Ratio
6. Cloud cover-(Okta)
7. Ambient temperature (°C)
8. Rainfall (mm)
9. Relative Humidity (%)

d) Telemetry system/Infrastructure Requirements :

1) Vendor(s) of Remote Terminal Units (RTUs)/ Sub-Station Automation System (SAS)/ Renewable Energy Sources (RES)/system integrator shall be required to provide/install & commission required telemetry system/ Infrastructure at their own risk & cost at their respective site(s) and at SLDC, Ablowal, Patiala (i.e. hardware, communication connectivity, mounting arrangements, cables/wires etc. including tools/software(s) to counter data hacking/cyber-attacks in the commissioned system/ infrastructure etc.) as per the approval conveyed by SLDC for successful integration of their remote plant(s)/site(s) data. They shall ensure strict compliance of standard industry practises/safety provisions as required to complete their work to the satisfaction of SLDC.
2) RTUs/SAS/RES vendor(s)/system integrator(s) shall ensure redundancy of the Communication Link /Connectivity for round the clock availability of telemetry data of their plant(s)/site(s) in Punjab SLDC.

Note(s):

1. Due to space constraint in SLDC Building as mentioned above, it shall not be binding upon the SLDC to consider/approve an independent telemetry system/infrastructure for each and every RTUs/SAS/RES vendor(s)/system integrator as proposed by them.
2. As an alternative to the above, RTUs/SAS/RES vendor(s)/system integrator(s) may use on shared basis, the existing data integration facilities as provided, as per the terms & conditions mutually agreed upon.
3. RTUs/SAS/RES vendor(s)/system integrator(s) shall be liable to upgrade/replace their existing telemetry system (at their own cost & risk) in compliance to meet with regulations/statutory

requirements as issued by any Government agency/ CEA/CERC/PSERC/PGCIL/NRPC/FOLD/PSPCL/PSTCL/SLDC etc. from time to time. There shall be no financial implications to SLDC.

4. RTUs/SAS/RES vendor(s)/system integrator(s) shall be liable to pay the charges (including telemetry data integration charges), if any, as decided/levied by Government of India/Punjab/CEA/CERC/PSERC/FOLD/PSPCL/PSTCL/SLDC etc. from time to time.

e) Other General Requirements (for RTUs/SAS/RES vendor(s)/system integrator(s)) :

1) They shall be required to get all the requisite prior approval from concerned offices PSTCL(Punjab SLDC Office) before taking up any activity (in hand).
2) They shall be fully responsible for proper upkeep and maintenance of their telemetry system so as to ensure round the clock availability of telemetry data in Punjab SLDC. **Punjab SLDC shall not be responsible in any way**.
3) Telemetry Data as integrated with SCADA system at SLDC Ablowal shall remain under observation for its quality /continuous availability at SLDC Control centre, Ablowal, (Patiala) for a period of minimum of 30 days from the date of it's integration before declaring the said telemetry system as "Successfully Integrated with SCADA system"
4) They shall also ensure cyber security audit of their telemetry system from the third party Independent agencies registered with Indian Computer Emergency Response Team, which is a functional organisation of Ministry of Electronics and Information Technology, Government of India (http://www.cert-in.org.in/) or other agencies only authorised by government time to time in compliance against cyber security threats and accordingly shall submit certified reports to this office within 30 days of integration of their RTU/SAS/plant data with SCADA system and subsequently submit certified reports as above every year.
5) In case of any failure of SCADA system/ any loss of data either due to non -compliance of Sr. no. 4 above or any other lapses in the telemetry system provided by RTUs/SAS/RES etc. vendor(s)/system integrator(s), they shall be liable to pay damages/penalties as per the provisions of various acts in place and as decided by competent authority.
6) They shall have to comply with the instructions issued by CEA/CERC/PSERC/PSPCL/PSTCL/SLDC or any other statutory body etc. from time to time. In case of any dispute regarding hardware/software/or any other technical issues, the decision of SLDC shall be applicable whatsoever.
7) Contact details/ e-mail Ids of all the concerned persons, including office contact details of Company(owner of plant), site engineer, Control room Number and that of the PSTCL/PSPCL sub-station, to which RES power is proposed to be injected, shall be made available to this office & may be updated after every 3 months.

III Contact Details of Officers/Officials of Punjab SLDC are as follows:

S.No.	**Designation**	**Contact No.**	**E-mail ID**
1	SE/SLDC(P&S)	9646118007	se-sldcprojects@punjabsldc.org
2	ASE/SCADA-EMS	9646112561	srxen-sldc2@pstcl.org
3	AEE/SCADA-EMS	9646105014	
4	AE/SCADA-EMS	9646112817	

Annexure-III

Format for day ahead schedule submitted by Wind/Solar Generator or QCA

Date:

Name of the wind/solar Generator or QCA _____					
schedule for dated _____					
Revision No. _____					
Time of Revision _____ **Hrs**					
Time of Receipt by SLDC ----------**Hrs**					
Time-Period			**Available Capacity Day Ahead**	**Day Ahead Forecast**	**Day Ahead Schedule**
Block	**From (Hrs: MM)**	**To (Hrs: MM)**	**(MW)***	**(MW)***	**(MW)***
1	0:00	0:15			
2	0:15	0:30			
3	0:30	0:45			
4	0:45	1:00			
-	-	-			
-	-	-			
-	-	-			
-	-	-			
93	23:00	23:15			
94	23:15	23:30			
95	23:30	23:45			
96	23:45	24:00			
Total in MWHr (for 24 Hrs)					
Maximum during the day (MW)					
Minimum during the day (MW)					
Average during the day (MW)					
*** All figures at Ex-Bus Periphery.**					
(Name, designation & Signatures of Scheduling Officer-Incharge)					

ANNEXURE-III cont..

Format for week- ahead schedule submitted by Wind/Solar Generator or QCA

Date:

Name of the wind/solar Generator or QCA _____

schedule for weak _____

Revision No. _____

Time of Revision _____ **Hrs**

Time of Receipt by SLDC ----------**Hrs**

Time-Period			**Schedule for weak ahead (Day wise)**						
			Day1	**Day2**	**Day3**	**Day4**	**Day5**	**Day 6**	**Day7**
Block	**From (Hrs: MM)**	**To (Hrs: MM)**	**(MW)***	**(MW)***	**(MW)***	**(MW)***	**(MW)***	**(MW)***	**(MW)***
1	0:00	0:15							
2	0:15	0:30							
3	0:30	0:45							
4	0:45	1:00							
-	-	-							
-	-	-							
-	-	-							
-	-	-							
93	23:00	23:15							
94	23:15	23:30							
95	23:30	23:45							
96	23:45	24:00							
Total in MWHr (for 24 Hrs)									
Maximum during the day (MW)									
Minimum during the day (MW)									
Average during the day (MW)									

*** All figures at Ex-Bus Periphery.**

(Name, designation & Signatures of Scheduling Officer-Incharge)

Annexure-IV A

(To be submitted on Notarized Affidavit)

Pooling Station Name:_____

Name of Stand-alone generator/ QCA: _____

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

Date: _____

Place: _____

Sign: _____

Authorized Signatory
Name:_____
Designation: _____
Name of Stand-alone generator/ QCA:
_____
Seal:

Annexure-IV B

UNDERTAKING TO BE GIVEN BY PROSPECITVE Stand-alone Generator/ QCA AT THE TIME OF REGISTRATION

Name: M/s_____ (Name of Stand-alone generator/ QCA), _____(Postal address)_____

(To be provided by the QCA on a stamp paper attested by Notary Public)

1. I/We, as a Stand-alone Generator/ QCA will be regulated by PSERC (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019 as amended from time to time.
2. The Deviation Settlement charges shall be as per the PSERC Regulations read with these guidelines for which we as QCA will be responsible for the pooling stations/ Generator for which we represent as a QCA. *(for QCA only)*
3. We as QCA fulfill all the Operational requirements as per Sr. no. 5 of detailed procedure, as under:- *(for QCA only)*
   - i We have fully functional forecasting and scheduling tools to obtain the desired output.
   - ii We have the experience in the field of Wind and/or Solar Power forecasting and scheduling for 100 MW projects (including cumulative pilot projects) and a minimum period of one (1) year with appropriate accuracy levels in forecasting.
   - iii We have an experience in working in different terrain & regions, as Wind /Solar generation depends on these factors and such experience facilitates better scheduling.
   - iv We have capability to handle multiple plant owners connected to a pooling station in order to be well positioned to de-pool deviation charges.
   - v Our financial strength of the QCA is in a position to handle the risk of penalties due to deviation charges applicable to RE generator. Our net worth is more than Rs. 1.50 Crores in the previous financial year, which reflects from our audited accounts duly certified by the Charted Accountant.
   - vi We have a compatible system in place for seamless flow of information to and from SLDC in order to facilitate forecasting, scheduling and revision of schedule, intimation of outages/grid constraints etc. and we have capability to provide real time monitoring systems in place for seamless flow of information to and from SLDC.
   - vii We have an established team of Renewable Resource Analysts, modeling Statisticians/data Scientists, Energy modelers and 24*7 operation and monitoring team.

4. As per the PSERC Regulations, I/we as a Stand-alone Generator/QCA, agree to provide the forecasting schedules to SLDC on day-ahead and week ahead basis on behalf of Wind and Solar Generator/ pooling stations connected to STU/DISCOM.
5. We as QCA agree to provide the authorization/ consent letter from all the generators connected to the pooling station/RE Generator and beneficiary(ies) for being appointed as the QCA. *(for QCA only)*
6. I/We understand that we can revise the day ahead schedules for a maximum of 16 revisions during the day as per the regulations.
7. I/We agree that if there is any deviation from the schedule, then for such energy, Deviation charges will be applicable as per the regulations as amended from time to time.
8. We shall be responsible for commercial settlements with the SLDC on behalf of wind and solar generators connected to the pooling station and generators. *(for QCA only)*
9. I/We understand that the SLDC will compute the comprehensive Deviation charges and raise bill for the deviation on weekly/monthly basis, as may be applicable.
10. DSM Account shall be prepared as per PSERC (Forecasting, Scheduling, Deviation settlement and Related Matters of Solar and Wind Generation sources) Regulations, 2019
11. I/We as Stand-alone Generator/QCA will abide by PSERC (Forecasting, Scheduling, Deviation settlement and Related Matters of Solar and Wind Generation sources) Regulations, 2019 as amended from time to time for all transactions.
12. I/We shall establish necessary communication system for telemetry of Real Time Data from the turbine/inverter level to the Interface Point (Generator/ Pooling Station) and from Interface Point to SLDC (including necessary interfacing arrangements for data integration at SLDC end) for the purpose of monitoring and billing as per procedure.
13. In the event of any fault in generating system resulting in lower generation then, I/we will revise the schedule and the same shall be intimated to SLDC as per the procedure.
14. I/We agree to submit Bank Guarantee for the amount of Rs.20,000/MW for solar generation and Rs. 50,000/MW for wind generation.
15. I/We agree to provide WTG's/ Inverter's static data and pooling stations details as per the formats specified by SLDC.
16. I/We agree, if payments against the Charges for Deviation Charges are delayed by more than two days, i.e. beyond seven (7) working days from the date of issue of final DSM account by SLDC, the defaulting Stand-alone generator/ QCA shall have to pay simple interest@ 0.04% per day in addition and in case the payment is not made even after a lapse of 60 days from issuance of final DSM account, process to invoke Bank Guarantee shall be initiated.
17. I/We will be responsible to ensure healthiness of metering equipment during the period of schedule/ injection of power and will inform SLDC about defect/ change in metering equipment within 24 hrs of such defect coming to notice/ change of metering

equipment. In absence of timely receipt of such information from us, I/We will be responsible for any loss to SLDC/ PSTCL on this account.

18. I/We agree to accept the decision of Commercial & Metering Committee/ appropriate commission (CERC/PSERC)
19. I/We agree to bear any loss to SLDC/ PSTCL incurred on account of misrepresentation/ concealment of facts by me/us.

I/We undertake all operational and commercial responsibilities on behalf of the Constituents as per the prevalent PSERC Regulations and are agreeing for the above terms and conditions for registering as Stand-alone generator /QCA with SLDC, Punjab.

Details of Payment Security is enclosed

(Name and Postal address of Stand-alone generator/ QCA)

_____

_____

_____

For Pooling Station:

PSPCL/DISCOM Injecting Station:

Voltage level at injecting point:

List of generators connected to the pooling station along with installed capacity for which consent is obtained *(for QCA only)*:

1.

2.

Declaration: All that is stated in the above is true and correct.

Note: Copy of Board Resolution of Authorized Signatory/ Power of attorney/ Authorization Letter in respect of signing authority to be enclosed.

Annexure-V

Performa Consent Letter

To,

Chief Engineer,
State Load Dispatch Centre,
PSTCL, Ablowal

Sub: Appointment of QCA as per PSERC Forecasting, Scheduling, Deviation Settlement and related matters for wind and Solar Generation sources Regulations, 2019.

Respected Sir,

We would like to inform you that we as the Wind/Solar power generator at (name) polling station have decided to exclusively appoint …….. only as the Qualified Coordinating Agency (QCA) for Forecasting, Scheduling and Commercial Settlement, as per PSERC (Forecasting, Scheduling, Deviation settlement and related matters for wind and Solar Generation sources) Regulations, 2019

Kindly find below the details of our capacity at ……..(Name) polling station having …….MW.

S.No.	Generator Name	No of WTGs/Panels	Contact Person	Mail ID & Contact No	Capacity in MW
1					…

We would like to state that hence forth the role of QCA at …. (Name) Poling station will be taken care by ……

Contact Person (Pool Generator 1):……

Address: ……

Phones (o) : …….. (M) : …….. (E-mail) : ……..

Contact Person 2 (Pool Generator 2): ……

(Address: ……

Phones (o) : …….. (M) : …….. (E-mail) : ……..

Contact Person 3 (Pool Generator 3): ……

Address: ……

Phones (o) : …….. (M) : …….. (E-mail) : ……..

Forecast Operations Desk : ……

(o) : …… (E-mail) : ……..

Contact Person (Beneficiary)
(concerned procurement agency)
Address: ……
Phones (o) : ……..
(M):……..(E-mail): ……

This is for your kind information and records.

Regards,

<<Signing Authority Name>>

<<Signing Authority Designation>>

ANNEXURE-VI

Tel :
Fax :
Email:

State Load Dispatch Centre
Punjab State Load Dispatch Centre

Stand-alone generator/ QCA Registration Form
(Regn No.____of the PSERC Regulations)

Tick relevant box

New Registration	Change of registration	Cancel registration

Tick relevant box

Wind Generation	Solar Generation

Tick relevant box

Individual	On behalf of Group of generators*

* If on behalf of Group of generators, attach consent/ Authorization form and copy of agreement executed with generators, if any.

Tick relevant box

Intra-State Pooling Station	Inter-State Pooling Station	Mixed Pooling Station

1	Name of the Entity			
2	Primary business (brief description)			
3	Business address			
Phone	Mobile	Fax	Email	website

4	Postal Address			
5	Contact person & designation			
Phone	Mobile	Fax	Email	
6	Name of Directors	Position	Mobile	E-mail
A				
B				
7	Financial details			

8. Pooling station represented				
Pooling station Name, Type & Address	Total installed capacity	PSTCL/ PSPCL Injecting Grid Sub Station	Voltage Level	Type (Wind/Solar)
Agreement & Appointing letter from the legal owners of WTGs.(Enclose copies)				

9. Details of Generator(s)				
Name of Generator (s)	Location of Generator(s) (Village, Tal, District)	Total unit-wise Installed Capacity (MW)	Type of transaction (Intra-State/ Inter-State)	Detail of beneficiary/ drawl point (Attach Notorized affidavit as per Format-IVA)

<table>
<tr><td colspan="6">10. Metering Details</td></tr>
<tr><td>Point of Injection</td><td>Main Meter</td><td>Check Meter</td><td colspan="2">CT Ratio</td><td>PT Ratio</td></tr>
<tr><td></td><td></td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>11.</td><td>Details of Registration Fee
(RTGS/ NEFT No.)</td><td colspan="4"></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td rowspan="4">12.</td><td rowspan="4">Details of Bank Guarantee
(No. & date)</td><td>Solar</td><td>MW capacity</td><td colspan="2">Amount</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
<tr><td>Wind</td><td>MW capacity</td><td colspan="2">Amount</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td rowspan="4">13.</td><td rowspan="4">Bank account Details of Stand-alone Generator/ QCA for handling DSM mechanism</td><td>A.C No.</td><td colspan="3"></td></tr>
<tr><td>IFSC Code</td><td colspan="3"></td></tr>
<tr><td>Name of the Bank</td><td colspan="3"></td></tr>
<tr><td>Address</td><td colspan="3"></td></tr>
</table>

Authorized Signature
And Official Seal
(For Stand-alone Generator/ QCA)

Note: Any change in aforementioned data/ information shall be conveyed to SLDC immediately.

ANNEXURE-VII

Format for Revision on the day of Actual Generation submitted by Wind/Solar Generator or QCA

Date:

Name of the wind/solar Generator or QCA	**_____**
schedule for dated	**_____**
Revision No.	**_____**
Time of Revision	**_____ Hrs**
Time of Receipt by SLDC	**----------Hrs**

Time-Period			**Day Ahead Schedule**	**Current Available Capacity**	**Revised Schedule**
Block	**From (Hrs: MM)**	**To (Hrs: MM)**	**(MW)***	**(MW)***	**(MW)***
1	0:00	0:15			
2	0:15	0:30			
3	0:30	0:45			
4	0:45	1:00			
-	-	-			
-	-	-			
-	-	-			
-	-	-			
93	23:00	23:15			
94	23:15	23:30			
95	23:30	23:45			
96	23:45	24:00			
Total in MWHr (for 24 Hrs)					
Maximum during the day (MW)					
Minimum during the day (MW)					
Average during the day (MW)					

*** All figures at Ex-Bus Periphery.**

(Name, designation & Signatures of Scheduling Officer-Incharge)

ANNEXURE-VIII

Format for curtailment schedule Issued by SLDC during contingency

Date:

Name of the wind/solar Generator or QCA	**_____**
schedule for dated	**_____**
Revision No.	**_____**
Time of Revision	**_____ Hrs**

Time-Period			**Required Schedule after curtailment**
Block	**From (Hrs: MM)**	**To (Hrs: MM)**	**(MW)***
1	0:00	0:15	
2	0:15	0:30	
3	0:30	0:45	
4	0:45	1:00	
-	-	-	
-	-	-	
-	-	-	
-	-	-	
93	23:00	23:15	
94	23:15	23:30	
95	23:30	23:45	
96	23:45	24:00	
Total in MWHr (for 24 Hrs)			
Maximum during the day (MW)			
Minimum during the day (MW)			
Average during the day (MW)			

*** All figures at Ex-Bus Periphery.**

(Name, designation & Signatures of Scheduling Officer-Incharge)

ANNEXURE-IX

Abstract of Payment to be made by the Stand-alone generator/ QCA to SLDC

Sr. No.	Reason for Payment	Amount (Rs.)	Time of Payment
1	Registration Charges	10,000/- for Stand-alone generator 20,000/- for QCA for each Pooling Station	Alongwith Application for Registration
2	Scheduling Charges	NIL	For each day
3	Revision in Schedules	NIL	For every revision
4	Forecasting services	3,000/-	Per day, if availed and provided by SLDC
5	Bank Guarantee	Rs.20,000/MW for solar generation and Rs. 50,000/MW for wind generation	During Registration
6	Any other charges	As approved by the Commission from time to time	As required