TRANSMISSION CORPORATION OF ANDHRAPRADESH LTD
AP STATE LOAD DESPATCH CENTER, VIJAYAWADA

Procedure for implementation of DSM for Wind and Solar generation as per Regulation. 4 of 2017 of Hon'ble APERC

1. **Objective:**

   1.1 The main objective of the forecasting & Scheduling is to provide advance prediction of wind and solar power generation close to actual, so as to assist the system operator in smooth grid operations and enhance grid security dispatch the energy in most economical way. The RE Forecasts in week ahead ,Day ahead/Intra Day will support SLDC in conventional generation scheduling, balancing needs, grid operation planning, load flow calculation and planning ancillaries any further large scale grid integration of RE power.

   1.2 The Procedure is issued in pursuance to clause 4.2(c),4.6,5.2,6.11 of Regulation : 4 of 2017 *Andhra Pradesh Electricity Regulatory Commission Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulation, 2017.*

   1.3 The Procedure shall be called "Procedure for implementation of *Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation*" or in short "DSM Procedure".

   1.4 The Regulation:4 of 2017 of APERC is in force with effect from 21st August, 2017.

   1.5 The DSM Procedure i.e., Forecasting, Scheduling and Deviation settlement in accordance with Regulation:4 of 2017 of APERC shall commence from 1st January, 2018, while the levy and collection of deviation charges shall commence from 1st July, 2018.

2. **Applicability**

   This Regulation is applicable to all wind and solar generators connected to the Grid, including those connected through pooling stations and supplying power to the DISCOMs, or to third parties through open access or for captive consumption through open access, and selling power within or outside the State.

3. **General Conditions:**

   3.1 APSLDC is the implementing Agency of DSM as per the Regulation.4 of 2017 of Hon'ble APERC.

   3.2 The DSM will be implemented through online dedicated tools. The SLDC will provide User ID and Passwords to the registered QCAs for handling the DSM through APSLDC web portal.

   3.3 The DSM is a process of comparing and calculating the deviations in the Schedule

provided and actual generation recorded by the Interface Billing Meter.

3.4 The SEM are available on the HV side of the Transformers in pooling station and incase of direct injection to Grid through a common / Dedicated feeder, the SEMs are in Grid SS. The Schedules shall be provided on Interface Billing Meter..

3.5 All the wind and Solar generators shall submit the week ahead, day-ahead generation forecast and Available Capacity (AVC) to the SLDC through a QCA or one of the generator acting as a lead Generator in case of more than one Generator is connected to the Interface point and having common Interface Billing Meter (SEM).

3.6 The forecasting shall be given on the Common Interface Billing meter connected at inter connection point at Grid SS or at pooling Station. The generators will not be allowed to provide individual schedules who are having a common Interface Billing Meter at interface point or HV side of Pooling Station as the actual generation (SEM reading) is not separately readable for each generator from the Common interface Billing SEM.

3.7 The forecast by a wind or solar generator or the QCA, as the case may be, shall be provided separately for each Pooling station One Schedule from one pooling station is allowed from the QCA or Lead generator as all the generation is pooled up in the Pooling Station and common Interface Billing SEMs are available.

3.8 The QCA may aggregate Schedules of more than one Interface Billing Meters(SEMs) i.e., pooling Station as a virtual pool. But within a Pooling Station more than one schedule is not allowed.

3.9 The forecasting/ scheduling jurisdiction and procedure, metering, energy accounting and accounting of Deviation charges shall be as per the relevant regulations notified by APERC from time to time.

3.10 The QCA shall create a Bank Account for each pooling Station / Common Feeder and provide the details to the SLDC for handling Deviation charges

Procedure for implementation of DSM

4. *Step-1: Formation of QCA by Generators & Submission of Agts or appointment letter to QCA for getting registered with SLDC.*

4.1 Wind and Solar Generators connected to the grid SS through a Pooling Station shall appoint a Qualified Coordinating Agency (QCA) with a consensus among the Generators in that pooling Station or one of the Generator may act as a lead generator with the consensus among the generators and shall be registered as a QCA at SLDC.

4.2 Wind and Solar generators (more than one legal owner)connected to the Grid SS/

Discom SS through a common feeder shall appoint a QCA with a consensus among the Generators connected to that feeder or one of the Generator may act as a lead generator with the consensus among the generators and shall be registered as a QCA at SLDC.

4.3 Wind and Solar generators (single legal owner) connected to the Grid SS/ Discom SS through a dedicated feeder may appoint a QCA or may act as a QCA and shall be registered as a QCA at SLDC.

4.4 If there is no consensus among the Generators connected in a pooling Station or connected to Grid SS through a Common feeder for formation of QCA, then generators who are not willing and no consensus with other generators to form QCA shall take separate connectivity from the STU/Discom and have a separate SEM at interconnection point and furnish the Schedules.

4.5 Wind and solar generators who have common Interface Billing SEM ,shall appoint and submit a declaration /Undertaking / mutual agreement clearly specifying the 'QCA' who shall be responsible for coordinating on behalf of all the generators connected to the pooling Station or connected to Grid SS through a dedicated or Common feeder on issues like SCADA, metering, scheduling, deviation charges, and other responsibilities specified in the DSM Regulation. All wind and solar generators connected to the pooling station and connected to Grid SS through common feeder shall provide all the required support to the Coordinating Agency.(Format)

4.6 QCA shall be the single point of contact with SLDC on behalf of its coordinated generator(s).

5. *STEP-2 : Qualified Coordinating Agency (QCA)*

a) General:

5.1 QCA is the agency appointed by all the concerned generators who have common SEM/SEMs for coordinating with the APSLDC in all the matters stipulated in DSM regulation and other relevant Regulations.

5.2 On submission of Agreement between all the concerned Generators of that Pooling Station / common feeder and QCA/ Lead generator , the agency will be registered as QCA for that Pooling Station/ Common feeder/dedicated feeder.

5.3 Only one QCA will be allowed within a pooling station with common SEM and QCA can aggregate forecasting of more than one pooling station (more than one common SEMs) as virtual pool.

5.4 The QCA shall submit forecasting for Wind and Solar generation separately.

5.5 Occurrence of any of the event of default by QCA may be treated as per the directions issued by Hon'ble APERC from time to time.

5.6 In the event of Non-payment or delay in payment of Deviation Charges by QCA, the BG will be encashed without any notice.

b) Qualifications & guidelines for registration of QCAs

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

5.8 The QCA shall have fully functional Forecasting tool to obtain desired outputs.

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

5.10 The QCA shall have the experience in the field of Wind/Solar Power forecasting and scheduling for a minimum period of 2 years with appropriate accuracy levels in forecasting.

(Note: In case of Lead generator or individual Generator acting as QCA, the experience clause is not applicable)

5.11 The financial strength of the QCA must be such that it should be in a position to handle the risk of penalties due to deviation charges applicable to generator. Considering this the net worth of the QCA for forecasting & scheduling services must be in positive amounting to at least Rs. 2.75 Crores in the current financial year which should reflect from its audited balance sheet or CA's certificate.

5.12 QCA shall pay a Bank Guarantee for the amount equivalent to Rs. 22500 per MW for solar generation and Rs. 45000 per MW for wind generation.

5.13 The QCA shall have capability to handle multiple plant owners connected to a Pooling Sub Station in order to be well positioned to de-pool deviation charges.

5.14 The QCA must have experience in working in different terrain & regions as wind/Solar generation depends on these factors and such experience facilitates better scheduling.

5.15 QCA should have an established team of Renewable Resource Analysts, modelling Statisticians, Energy models, Software developers and 24x7 operation and monitoring team.

5.16 QCA will be regulated by the regulations issued by CERC/APERC/CEA from time to time.

5.17 The QCA shall abide by the instructions issued by SLDC in consistent to the relevant Regulations.

5.18 The QCA shall agree to provide the forecasting schedules to SLDC on week-ahead and day-ahead and intraday revisions on behalf of Wind / Solar pooling stations as per the regulations of Hon'ble APERC..

5.19 The QCA shall have equivalent systems in place for seamless flow of information to and from SLDC in order to facilitate scheduling, revision of schedule, intimation of outages/grid constraints , curtailment etc.

5.20 The QCA shall have capability to provide real time monitoring systems (SCADA) in place for seamless flow of information to and from SLDC.

5.21 QCA shall undertake commercial settlement of any other charges on behalf of the concerned generators, as may be mandated from time to time.

5.22 The QCA shall establish a Control center round the clock in Pooling station and shall obey the instructions from SLDC on curtailment and emergencies. If the QCA dis obey the instruction of System operator during emergencies, appropriate decision will be taken by the System operator in view of Grid Security and Safety.

5.23 QCA shall have to ensure confidentiality of all the data provided by the SLDC and the data shall not be shared without written permission from SLDC.

5.24 The QCA shall have established alternate voice and data communication with SLDC.

5.25 The QCA shall establish protocol for communication with Individual Generators to implement the instructions of System operator and SLDC.

5.26 The QCA must store the historical data (Wind Velocity, Wind Direction, Power generation in MW for Wind and Solar Insolation, Power generation in MW for Solar) and transmit to the SLDC whenever requested by the SLDC.

c) Registration of QCA with APSLDC:

5.27 The QCA shall obtain the appointing letter and Agreement with the generators who have appointed him as a QCA and then apply for registration on APSLDC web portal.

5.28 The eligible QCA will be registered and Registration ID, User ID & Pass word will be provided by the SLDC for handling DSM in APSLDC web portal.

5.29 In case QCA has obtained registration on the basis of false information or by suppressing material information and the registration of such entity is revoked.

5.30 The registration of the QCA will be revoked on the request of majority generators who are appointed the QCA.

5.31 The QCA may cancel their Registration by submitting NOC from the concerned Generators. The Generators shall choose another QCA and got it registered before issuing NOC to old QCA.

5.32 In the event non-compliance of any of the terms/conditions/rules outlined under Regn.4 of 2017 by QCA/Generators, then the registration of the QCA will be revoked by the SLDC.

d) Responsibilities of QCA:

5.33 The QCA shall share the forecasting model with the SLDC.

5.34 The legal owner of any wind/Solar aggregated generating facilities must have a designated and qualified operator available twenty four (24) hours a day every day for contact and Communication with the SLDC, in accordance with SLDC instructions and other communication policies and protocols.

5.35 The Deviation Settlement charges shall be as per the State regulatory guidelines for which QCA will be responsible.

5.36 QCA shall provide Turbine/Inverter and pooling stations details (Static data) through online tool as specified by SLDC in the web portal.

5.37 The QCA shall transmit the weather data in real time from the Turbine/inverter level to SLDC i.e., Metrological tower Unique ID, Wind speed, wind direction, Surface Pressure, Ambient Temperature, Relative humidity, percentage cloud cover and any other data as and when required by SLDC.

5.38 The QCA shall accept the Energy and Deviation accounts for inter-State and intra-State transactions prepared by the SLDC.

5.39 QCA shall also de-pool energy deviations as well as deviation charges to each of the generators connected to the pool. The de-pooling of the energy deviations at the pooling station amongst different generators connected to the pool can be apportioned on the basis of the deviations of each generator and upload the statement of de-pooling to SLDC on monthly basis in the SLDC DSM tool..

5.40 The QCA shall maintain historical data, all necessary and required records, registers and accounts in respect of forecasting, scheduling and deviation settlement in accordance with this Regulation and shall furnish to SLDC on request.

5.41 QCA shall record and transmit the data of operation LVRT & HVRT on monthly basis.

5.42 QCA shall ensure periodical testing and calibration of SEMs as per the CEA Metering Regulations and Procedures of APTRANSCO.

5.43 QCA shall have the Forecasting Tool that has Forecasting accuracy analysis, support in uploading Forecasts to SLDC tool in JSON protocol, information delivery to scheduling tool, support visualization of real time generation forecasts as well as provide platform to exchange required necessary information like Real time data etc. for accurate forecasting through SCADA.

e) Protocol for data exchange:

5.44 The legal owner of any wind/Solar aggregated generating facilities (QCA) must have a designated and qualified operator available twenty four (24) hours a day every day for contact and Communication with the SLDC, in accordance with SLDC instructions and other communication policies and protocols.

5.45 QCA shall ensure smooth and reliable RE generation, AVC and data exchange of other parameters to/from QCA to SLDC through Web based DSM tool. QCA will also ensure data transfer to SLDC regarding Available Capacity of individual Turbines/ inverters and maintenance schedules invariably, for use of SLDC in producing power forecasts and Deviation calculations taking to account RE generation capacity availability (AVC).

5.46 SCADA Tools:SCADA from the turbine level to Pooling Station in real time shall be provided up to the Pooling Station by QCA /Generators. The data from the Pooling Station to the connected Grid SS shall be transmitted with IEC:104/101 protocol without any interruption by QCA.

6. *STEP-3: Submission of Static data of WTGs / Solar Plants to SLDC*

6.1 Qualified Coordinating Agencies (QCA), shall provide to the SLDC DSM tool on SLDC portal the technical specifications of the generating units and all other associated equipment of the wind / solar farm, as per the formats (Annexure- 2) by 1st January, 2018 or the date of Commercial Operation, as the case may be and thereafter, whenever there is any change in such technical specifications.

6.2 Historical data (Wind Velocity, Wind Direction, Power generation in MW for Wind and Solar Insolation, Power generation in MW for Solar) of Power generation in block wise since COD.

6.3 The Historical data, SCADA / SEM data of Generators and other static information shall be provided to the SLDC through respective user access portal in the website of SLDC.

7. *STEP-4:Forecasting by SLDC*

7.1 The QCA shall provide the real time parameters at turbine/inverter level to SLDC which are required for forecasting by APSLDC.

7.2 The SLDC will forecast the wind and solar generation in the SLDC control area and publish in the APSLDC portal.

7.3 The APSLDC will validate, process the SEM data and computing the net injections by each pooling station. The SLDC will monitor such that there is no gaming (gaming is an intentional mis-declaration of AVC by any generating station or QCA in order to make an undue commercial gain).

7.4 The wind or solar generator or QCA will have the option of adopting the SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast. Any commercial impact on account of deviation from schedule based

on the forecast shall be borne by the wind or solar generator either by itself or through the representing QCA.

8. *STEP-5 : Forecasting & Revisions and Realtime SCADA data to SLDC*

8.1   All the QCAs will separately be provided a user login into the SLDC DSM tool for accessing the forecasting related data. The QCA shall upload the Forecasting data in "JSON" format.

8.2   QCA shall provide Power forecast, Schedules and AVC on Week ahead, Day ahead as well as Intra-day basis to SLDC web portal as per Regulation : 4 of 2017 of Hon'ble APERC.

8.3   The temporal resolution for power forecasts and AVC for day ahead/intraday will be 15 min block interval. Wind and solar power forecast and AVC have to be delivered separately at pooling station level/ Grid SS level.

8.4   Day Ahead Forecasting: Power Generation Forecast and AVC with the temporal resolution of 15 minutes for next day starting from 00:00 to 24:00 hrs.

8.5   Day ahead forecast and AVC shall be provided by 10.00 hrs. every day for next day and same may be revised by 15.00 hrs.

8.6   During Intraday 16 revisions for Wind Generators and 9 Revisions for Solar generators are allowed as per Regulation : 4 of 2017 of Hon'ble APERC.

9. *STEP-6: Calculation of Energy Deviations & deviation Charges:*

a)   *Implimented Schedules:*

9.1   15 min Block wise implemented schedules will be prepared by the SLDC based on the Forecasting and intraday revisions provided by the QCA.

b)   *Collection of Energy Meter Dumps(Actual Energy generation)*

9.2   Based on the voltage level and interconnection point, the STU/Discoms will download the data of actual generation from the SEM on monthly basis and the Dumps will be uploaded to the APSLDC web portal.

9.3   QCA shall Coordinate with DISCOM / STU / SLDC for metering, data collection, communication.

c)   *Calculation of Energy Deviations& Deviation charges*

9.4   The Energy account and Deviation charges will be calculated as per the regulation.4 of 2017 of Hon'ble APERC.

9.5   A statement of energy accounting i.e., Energy Deviations and corresponding Deviation charges for each pooling station shall be prepared by the SLDC on monthly basis, based on forecasting submitted by the QCA and SEM data received from the concerned DISCOM/STU

d) ***Publishing the deviation account in the SLDC Web site***

9.6 The SLDC will publish the Deviation data i.e., Energy deviations and corresponding deviation charges in the SLDC web site and shall be open to the respective entities for checking/verification for a period of 7 days. In case any mistake is detected by QCA, on report by QCA the SLDC shall forthwith make a complete check and rectify the mistakes and publish the final deviation Account.

10. *STEP-7:De pooling of Deviation charges to individual Generators by QCA and collection of deviation charges from the generators.*

10.1 The de pooling of deviation charges among the generators shall be carried out by the QCA on prorata basis.

11. *STEP-8:Transfer of deviation charges to State pool Account*

a) ***State Pool Account:***

11.1 State Pool Account means a separate account will be created, maintained and operated by SLDC in accordance with the provisions of the Regulation: 4 of 2017 of Hon'ble APERC for receipts and payments on account of deviations specified under DSM regulation.

11.2 All payments on account of Deviation Charges, as described and levied under the Regulation:4 of 2017 of Hon'ble APERC, and interest, if any, received for late payment shall be credited to the State Pool Account.

11.3 QCA shall Undertake commercial settlement of forecasting deviations including payment of deviation charges to the State Pool Account on behalf of the concerned generators.

11.4 QCA shall Undertake de-pooling of payments received on behalf of the concerned generators from the State Pool Account and settling them with the individual generators.

11.5 QCA shall Undertake commercial settlement of any other charges on behalf of the generators or Generators connected to a pooling station, as may be mandated from time to time.

11.6 QCA shall Undertake any other ancillary and incidental matters notified by the Hon'ble Commission from time to time.

b) ***Monitoring of Payment of Deviation charges:***

11.7 Payment of all charges on account of energy accounting of Pooling Station of Wind and Solar plants shall have a high priority and the concerned QCA shall pay the indicated amounts within 10 (ten) days from the date of issue of the accounts by the SLDC.

11.8 If payments against the charges on account of energy accounting of Pooling station are delayed by more than two days, i.e., beyond twelve (12) days from the date of

issue of the statement by the SLDC the defaulting QCA shall have to pay simple interest @ 0.04% for each day of delay.

11.9 All the transactions shall be through ECS only

c)   ***Upload of De pooling Statement by QCA.***

11.10 The QCA shall upload the depooling statement and payments made to the State pool Account to the APSLDC web portal.

d)   ***Event of default and consequences thereof:***

11.11 Following events shall constitute event of default by QCA /Generators

a) Non-payment or delay in payment of Deviation Charges by QCA/Generators.

b) Non-compliance of any of the terms/conditions/rules outlined under this Procedure and Regn.4 of 2017 by QCA/Generators.

c) Non-compliance of any of the directives issued by SLDC, so long as such directives are not inconsistent with any of the provisions of APERC DSM Regulations

d) In case QCA has obtained registration on the basis of false information or by suppressing material information and the registration of such entity is revoked .

Consequences for Event of default:

e) However, the SLDC shall provide adequate notice and chance to QCA/Generator to present its case before serving the Notice for dis connection from grid, which shall not be for period lower than 14 days.

f) In case QCA/Generator fails to address/rectify the default expressed by the SLDC in the Notice within stipulated time period of 14 days, the SLDC shall proceed with revocation of registration of QCA and disconnection from grid.

Tel :
Fax :
Email : remcapsldcl@gmail.com

State Load Dispatch Centre
Transmission Corporation of Andhra pradeshg Limited

QCA Registration Form
(Regn No.4 of 2017 of Hon'ble APERC)

Tick relevant box

	New Registration		Change of registration		Cancel registration

Tick relevant

	Wind Generation		Solar Generation

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**	**Email**
a				
b				
c				
d				
e				

7	Financial details	

8	Pooling station represented				
Pooling station Name and address	**Total Installed capacity**	**APTRANSCO/DISCOM Injecting Grid Sub station**	**Voltage Class**	**Type (Wind/Solar)**	
Agreement & Appointing letter from the legal Owners of WTGs. (Enclose Copies)					

9	Details of BG/Security deposit	**Solar**	**MW capacity**	**Amount**
		Wind	**MW capacity**	**Amount**

9	Bank account Details of QCA for handling DSM mechanism	**A/C no.**		
		IFSC Code		
		Name of the bank.		
		Address		

Authorized Signature
and official Seal
(for Aggregator/QCA)

DECLARATION

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

I/We_____ certify that all information furnished above is/are true to the best of my/our knowledge and belief.

I/We shall abide by such terms and conditions that the APERC, APTRANSCO,SLDC may impose to participate in the DSM for Solar & Wind from time to time.

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

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

INDEMNIFICATION

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

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

Date :   Signature of the QCA

Formats for Static & Dynamic data

Type of Generator	Data Item	Responsible Entity	
Wind & Solar	**Developer Details**	NREDCAP	
Wind & Solar	**Name of the Power Generating Plant**		
Wind & Solar	**Name**		
Wind & Solar	**Address**		
Wind & Solar	**e mail id**		
Wind & Solar	**Phone nos**		
Wind & Solar	Nodal Person ,Ph:, E mail ID		
Wind & Solar	**Capacity Allocation MW**		
Wind & Solar	**Site details**		
Wind & Solar	**Location**		
Wind & Solar	**Address**		
Wind & Solar	**Village**		
Wind & Solar	**Mandal District**		
Wind & Solar	**Connectivity**	ED/PLG	
Wind & Solar	**Capacity MW**	ED/PLG	
Wind & Solar	**Grid SS**	ED/PLG	
Wind & Solar	**Inter connection voltage level**	ED/PLG	
Wind & Solar	Connection Agt	ED/PLG	
Wind & Solar	Site Common Drg	ED/PLG	
Wind & Solar	Site Responsibility Schedule	ED/PLG	
Wind & Solar	**GPS coordinates**	ED/PLG	
Wind & Solar	**PS**	ED/PLG	
Wind & Solar	**PS Location**	ED/PLG	
Wind & Solar	**Address**	ED/PLG	
Wind & Solar	**Village**	ED/PLG	
Wind & Solar	**mandal**	ED/PLG	
Wind & Solar	**District**	ED/PLG	
Wind & Solar	**GPS coordinates**	ED/PLG	
Wind & Solar	**PSS Drg**	ED/PLG	
Wind & Solar	**No of feeders on LV side**		
Wind & Solar	**LV Bus voltage**		
Wind & Solar	**No of feeders on HV side**		
Wind & Solar	**HV Bus voltage**		
Wind & Solar	**Transformers**		
Wind & Solar	**Voltage ratio**		
Wind & Solar	**SEM details in PSS**		
Wind & Solar	**PS to GSS Lines**	ED/PLG	
Wind & Solar	**Voltage level**	ED/PLG	
Wind & Solar	**No of Ckts**	ED/PLG	
Wind & Solar	**Line Lengths**	ED/PLG	
Wind & Solar	**Conductor**		
Wind & Solar	**Synchronization**		
Wind & Solar			
Wind & Solar			
Wind & Solar	**Sync Permission from Discom**		Scanned copy
Wind & Solar	**Clearance Report from Sync Team - as per TOO**		Team consists of DE Op , M&P,DE/MRT, DE/O&M

				Transco
Wind & Solar	**Scada**			Will be checked by DE/SCADA SLDC
Wind & Solar	**Static Data**			
Wind & Solar	**LVRT affadavits**			Format -auto popup
Wind & Solar	**Type test certificates**			Scanned copy to be uploaded by DEV
Wind & Solar	**Request for Sync**			Requested by DE OMC concerned
Wind & Solar	**SLDC clearance**			Will be processed by RE, SCADA, SE,CE online
Wind & Solar	**Sync**			Mail to SLDC shift, DE filed
Wind & Solar	**PPA Details**		IPC	
Wind & Solar	**PPA**			
Wind & Solar	**PWPA**			
Wind & Solar	**Date of Agt**			
Wind & Solar	**Discom**			
Wind & Solar	**PPA validity**			
Wind & Solar	**Unit purchase cost**			
Wind & Solar	**Process of procurement**			
Wind & Solar	**Evacuation line details(PSS to GSS)**			
Wind & Solar	**Name of the connected Grid SS of Transco/Discom**		ED Plg , Discoms	STU/APEPDCL/APSPDCL
Wind & Solar	**Voltage level of evacuation lines from PSS to GSS**		ED Plg , Discoms	11 kV/33kV/132 kV,220Kv,400KV
Wind & Solar	**No of Evacuation line**		ED Plg , Discoms	
Wind & Solar	**Double ckt or Single ckt**		ED Plg , Discoms	
Wind & Solar	**SEM details**		CE/Zone, Discoms	
Wind & Solar	**Location of SEM**		CE/Zone, Discoms	
Wind & Solar	**SEM No**		CE/Zone, Discoms	
Wind & Solar	**Make**		CE/Zone, Discoms	
Wind & Solar	**type**		CE/Zone, Discoms	
Wind & Solar	**MF**		CE/Zone, Discoms	
wind	**Lines PSS to WTGs**			
wind	**Voltage level of the feeder from WTG to Pooling Station(11 kV/33kV/132 kV…)**			
wind	**Feader Nos**			
Wind	**WTGs details**			
Wind	**Legal Owner of WTG**			
Wind	**Name**			
Wind	**Address**			
Wind	**e mail**			
Wind	**ph nos**			

Wind	**WTG No**		
Wind	**Connected feader No**		
Wind	**Capacity MW**		
Wind	**Date of Sync**		
Wind	**COD**		
Wind	**LVRT**		
Wind	**Make of WTG**		
Wind	**Model (Model -A Model-B Model -A1 Model- B1)**		
Wind	**Hub height in M**		
Wind	**Is LVRT available? YES/NO**		
Wind	**LVRT settings furnished to state utilities (Yes/No)**		
Wind	**Meeting other requirements of CEA Regulations (Yes/No)**		
Wind	**Stall/Pitch Control**		
Wind	**V/W/X/Y/Z V= LVRT feature available, W= LVRT not possible, X = LVRT feature available to be enabled, Y = LVRT design supported but to be fitted, Z = LVRT feature to be retrofitted**		
Wind	**Is LVRT Enabled?**		
Wind	**WTGs with useful life beyond 04.01.2021**		
Wind	**WTGs with useful upto 04.01.2018**		
Wind	**Working WTGs Working/Now working**		
Wind	ABT Meters: Main, Check, Stand By	Developer	
Wind	SVC/STATCOM	Developer	
Wind	SCADA: Commn Type Availability of SCADA	Developer	
Wind	AMRs	Developer	
Wind	**Individual Genarators details**	Developer	
Wind	WTG Location No &	Developer	
Wind	GPS Co ordinates:	Developer	
Wind	Village, Mandal, District:	Developer	
Wind	Model	Developer	
Wind	Make	Developer	
Wind	WTG Type	Developer	
Wind	Capacity in MW	Developer	
Wind	Hub height in m	Developer	
Wind	total height in M	Developer	
	Power Curve	Developer	

Wind	**Generator Static Data**	Developer	
Wind	Rated wind speed m/s	Developer	
Wind	Rated electrical power at Rated wind speed :	Developer	
Wind	Cut in speed	Developer	
Wind	Cut out Speed	Developer	
Wind	Survival speed (Max wind speed)	Developer	
Wind	Ambient temperature for out of operation	Developer	
Wind	Ambient temperature for in operation	Developer	
Wind	Low Voltage Ride Through (LVRT) setting	Developer	
Wind	High Voltage Ride Through (HVRT) setting	Developer	
Wind	Rotor	Developer	
Wind	Stall/Pitch control	Developer	
Wind	Rotor diameter	Developer	
Wind	Number of blades	Developer	
Wind	Blade Length in M	Developer	
Wind	Area swept by blades	Developer	This data is Model specific data
Wind	Generator	Developer	
Wind	Make	Developer	
Wind	Model	Developer	
Wind	Generator Type	Developer	
Wind	Rated Gen. Voltage	Developer	
Wind	KW/MW @ Rated Wind speed	Developer	
Wind	KW/MW @ peak continuous	Developer	
Wind	Frequency Converter	Developer	
Wind	Filter generator side	Developer	
Wind	Filter grid side	Developer	
Wind	Transformer	Developer	
Wind	Transformer capacity	Developer	
Wind	Transformer cooling type	Developer	
Wind	Voltage	Developer	
Wind	Winding configuration	Developer	
Wind	**Generator Protection LVRT**	Developer	
Wind	LVRT Feature available		
Wind	LVRT Not Possible		
Wind	LVRT feature avilable to be enabled		
Wind	LVRT Design supported but to be fitted		
Wind	LVRT feature to be retrofitted		
Wind	LVRT Setting adopted(Enclose Test Certificate)	Developer	
Wind	Useful life of the WTG beyond 04.01.2021	Developer	
Wind	WTGS with useful life up to 04.01.2018	Developer	
Wind	**Real–time Data Telemetry requirement (Suggested List)**	Developer	
Wind	SCADA: Description of Wind Generation Data Communication between Field and SLDC	Developer	
Wind	SCADA Protocol	Developer	

Wind	Turbine Generation (MW)	Developer	
Wind	Wind Speed	Developer	
Wind	Turbine Availability Status	Developer	
Wind	^Generator Status (on/off-line)	Developer	
Wind	Nacelle Position (relative to true north)	Developer	
Wind	Wind Direction (relative to true north)	Developer	
Wind	Yaw Error	Developer	
Wind	Rotor RPM	Developer	
Wind	Blade Pitch	Developer	
Wind	Voltage	Developer	
Wind	Ambient.air temperature	Developer	
Wind	Barometric pressure	Developer	
Wind	Relative humidity	Developer	
Wind	Air Density	Developer	
Wind	MW,MVAR,V	Developer	
Wind	Power System Parameters	Developer	
Wind	**Generator Test Certificates**	Developer	
Wind	**Approved Test Reports**	Developer	
Wind	Type test certificated	Developer	
Wind	FAT certificates	Developer	
Wind	Precommissioning test certificates	Developer	
Wind	Test reports of Harmonic Current Injection	Developer	
Wind	Test reports of DC current Injection	Developer	
Wind	Test reports of Flicker	Developer	
	SOLAR		
	DEVELOPER/OWNER/COMPANY DETAILS		
Solar	***Name of owner or company or developer***	Developer	
Solar	Address	Developer	
Solar	Ph No	Developer	
Solar	Fax No	Developer	
Solar	E Mail Id	Developer	
Solar	***Nodal Person details:***	Developer	
Solar	**Name**	Developer	
Solar	Address	Developer	
Solar	Ph No	Developer	
Solar	Fax No	Developer	
Solar	E Mail Id	Developer	
Solar	**Physical Location of the Solar Poewer Park**	Developer	
Solar	Village	Developer	
Solar	Mandal	Developer	
Solar	District	Developer	
Solar	**GPS Cordinates of Solar Park: 4 Corners**	Developer	
Solar	1 st Corner Lat	Developer	
Solar	Lon	Developer	
Solar	2nd Corner Lat	Developer	
Solar	Lon	Developer	
Solar	3rd Corner Lat	Developer	
Solar	Lon	Developer	
Solar	4th Corner Lat	Developer	

Solar		Lon	Developer	
Solar	**GPS Cordinates of Solar Park: Centre**		Developer	
Solar		Lat	Developer	
Solar		Long	Developer	
Solar	**CAPACITY DETAILS**		Developer	
Solar	***DC capacity of Solar Panels:***		Developer	
Solar	***Cell & Panel Details:***		Developer	
Solar	Each Cell Voltage (V)		Developer	
Solar	No. cells in a Panel		Developer	
Solar	Connection combination of Panels		Developer	
Solar	Panel Voltage(V)		Developer	
Solar	No.of panels in a Array		Developer	
Solar	Array Voltage (V)		Developer	
Solar	Nos. of solar panel		Developer	
Solar	Capacity of each panel (KWp)		Developer	
Solar	Total Capacity(KWp)		Developer	
Solar	***AC Capacity***		Developer	
Solar	No of Arrays connected to each inverter		Developer	
Solar	Inverter input voltage		Developer	
Solar	Inverter output voltage		Developer	
Solar	No of Inverters		Developer	
Solar	Capacity of each Inverter(KW)		Developer	
Solar	Total Capacity of the Inverters(KW)		Developer	
Solar	***Inverter Transformer Details***		Developer	
Solar	No of Inverter Transformers		Developer	
Solar	No. of inverters connected to each transformer		Developer	
Solar	Capacity of each Tr(MVA)		Developer	
Solar	Total Capacity of the Inverter Trs(MVA)		Developer	
Solar	Input Voltage(KV)		Developer	
Solar	Out put Voltage(KV)		Developer	
Solar	Make of Inverter Trs		Developer	
Solar	Total extent of land in acres		Developer	
Solar	Capacity Approval from NREDCAP/GoAP to set up Plant(Attach copy) in MW		Developer	
Solar	Connectivity permission from STU/Discom(indicate name of the Discom)		Developer	
Solar	Total Evacuation permission Accorded in MW (Attach Copy)		Developer	
Solar	**Name of the pooling Station**		Developer	
Solar	*GPS coordinates:*		Developer	
Solar	Lat		Developer	
Solar	Long		Developer	
Solar	No of Transformers		Developer	
Solar	Capacity of each Tr in MVA		Developer	
Solar	Voltage rating		Developer	
Solar	Make of Trs		Developer	
Solar	**SCADA**		Developer	
Solar	Availability of SCADA to transmit the Power system parameters from the PS to SLDC in real time		Developer	
Solar	Availability of SCADA to transmit the inverter level data parameters to SLDC in real time		Developer	

Solar	Availability of SCADA to transmit the weather data and Forecasting parameters in real time to SLDC	Developer	
Solar	**Solar sensors are provided for (Yes/No)**	Developer	
Solar	Humidity	Developer	
Solar	UV Index	Developer	
Solar	Cloud cover	Developer	
Solar	Solar Insolation	Developer	
Solar		Developer	
Solar	**PARAMETERS TO BE TRANSMITTED IN REAL TIME FOR FORECASTING & SCHEDULING**	Developer	
Solar	Global horizontal irradiance (GHI)	Developer	
Solar	Ambient temperature	Developer	
Solar	Temperature at the back of the PV modules	Developer	
Solar	Diffuse Irradiance	Developer	
Solar	Direct Irradiance	Developer	
Solar	**Solar Panels & Inverter Details**	Developer	
Solar	Static data points:	Developer	
Solar	System location and orientation	Developer	
Solar	PV Panel Manufacturer and Model	Developer	
Solar	PV panel material -poly Csi /mono Csi/ a-Si Thinfilm/ CdTe Thinfilm/ CIGS Thinfilm	Developer	
Solar	Elevation and orientation angles of arrays or concentrators	Developer	
Solar	power Curve	Developer	
Solar	The type of solar generation technology employed at the Generating Facility	Developer	
Solar	Distance above mean sea level etc.	Developer	
Solar	Adjustable/Fixed Panel structure	Developer	
Solar	**LVRT & HVRT**	Developer	
Solar	LVRT feature available /not available	Developer	
Solar	LVRT Settings available	Developer	
Solar	LVRT Settings adopted	Developer	
Solar	HVRT feature available /not available	Developer	
Solar	HVRT Settings available	Developer	
Solar	HVRT Settings adopted	Developer	
Solar	Harmonic current injection as per (IEEE) Std.519	Developer	
Solar	Test of injection of DC current at interconnection point(shall not be greater than0.5% of the full rated output)	Developer	
Solar	Test of introduce flicker (IEC-61000)	Developer	