

Ref: GRID-INDIA/SO/2026/RE Plant/ Weather data/

Dated: 04-06-2026

To,

The Additional Secretary
Ministry of New and Renewable Energy
Atal Akshaya Urja Bhawan, CGO Complex
Lodhi Road, New Delhi

Sub: Telemetry of good quality weather data from Renewable Energy Plants.

Dear Sir,

Real time weather data from VRE plants is used as one of the inputs for weather forecasting and renewable energy forecasting as solar and wind generation are inherently dependent on weather conditions. Weather parameters such as solar irradiance, wind speed, wind direction, temperature, pressure, etc. are used for data assimilation and validation in Weather prediction Model. Adequate availability of good quality weather data from intra-state as well as interstate connected RE plants is a prerequisite for improvement in day ahead and intraday RE forecasting accuracy.

Indian Electricity Grid Code (IEGC)-2023 mandates the telemetry of weather data State/Regional/National Load Despatch Centre.

Vide letter ref. CEA/PLG/RT&I/15/11/2024 CEA advised SLDCs, QCAs and RE developers for sharing of weather data with NCMRWF/IMD at a frequency of six hours through secure APIs. CEA also recommended installation of pressure sensors wherever not available and sharing of weather parameters with NCMRWF. Guidelines regarding installation of Automatic Weather Stations (AWS) in new wind and solar plants were also issued by CEA on 07.07.2025 (enclosed as **Annexure-I**). IMD has also shared procedure for maintenance and calibration of Weather Monitoring Stations installed at VRE plants (enclosed as **Annexure-II**).

Ministry of Power (MoP) with MoES is actively pursuing for improving the accuracy of RE forecasting. Several initiatives have been taken such as migration of weather forecast from ECMWF to NCMRWF, enhancement of weather model spatial resolution from 12×12 km to 4×4 km and 2×2 km and increasing forecast update frequency. Indigenous VRE forecasting and satellite-based nowcasting tools through collaboration among IIT Bombay, GRID-INDIA, IMD, NCMRWF, NISE, NIWE, and ISRO is being developed. IMD is installing wind profilers in renewable energy-rich regions with grant from Power System Development Fund (PSDF) for improving accuracy of Numerical Weather Prediction Model. NISE in collaboration with GRID-INDIA and RE developers has taken up pilot project on hybrid day ahead and intraday weather forecasting by using All Sky Imager (ASI) Camera at five locations. Under India Denmark Energy Partnership (INDEP) development of satellite based solar nowcasting system has also been taken up by NCMRWF in collaboration with Danish Meteorological Institute (DMI), IMD, NISE and GRID-INDIA.

Weather data from interstate connected RE plant aggregating about 64 GW is available at NLDC. Weather data from intra-state connected RE plants aggregating about 107 GW (around 62% of the 171 GW capacity being monitored at SLDC/RLDC/NLDC is presently not available. Available weather data is being shared by NLDC four times a day with National Centre for Medium Range Weather Forecasting (NCMRWF) for assimilation and validation of output from their numerical weather

prediction models. Weather measurements are also used by NCMRWF for generating intraday weather forecast from high resolution rapid refresh rate (HRRR) model.

The sanity of telemetered weather data received from field is being checked by GRID-INDIA in collaboration with NCMRWF. It is observed that Pressure data is not received from solar plants. Pressure data is one of the critical parameters for weather forecast. Further, issues such as frozen data, abnormal spikes, implausible values, and communication failures in the telemetered weather data from RE plants make it challenging to use the data for model validation. Daily sanity reports are being shared with RE developers as well as RE associations. The sanity reports for Jan-Mar 2026 are attached as **Annexure-III** for ready reference.

RE plant Weather Parameters data availability from Jan 2026 to Mar 2026					
	0%	(0-25) %	(25-50) %	(50-75) %	(75-100) %
Number of Solar plants (GHI)	18	27	37	56	76
Number of Wind plants (Wind speed)	12	10	11	12	29

These sanity reports indicate the need for calibration and maintenance of weather transducers. RLDCs are following it up with the respective RE developers for corrective actions. The matter has been flagged in various meetings with VRE developers.

In view of the above it is kindly requested to use your good office in advising the RE plants for following:

- Rectifying issues to improve the data quality of weather data telemetered SLDC/RLDC/NLDC.
- Regular maintenance and calibration of weather measuring instruments.
- Establishment of monitoring mechanisms at RE developer end to periodically review the healthiness of the telemetry system and the quality of the data.
- Sharing of weather data from RE plants connected at intra state level either directly to NCMRWF through Secure File Transfer Protocol (SFTP) or through SLDCs/RLDC/NLDC.
- Installation of Automatic Weather Station (AWS) in new RE plants of capacity greater than 10 MW.

Thanking you,

Encl: As above

Yours faithfully,

(राजीव कुमार पोरवाल/Rajiv Kumar Porwal)

निदेशक(प्र. प्रा.), गिड-इंडिया /Director (System Operation), Grid-India

Copy to:

- Chairperson, Central Electricity Authority, Sewa Bhawan, R.K. Puram – New Delhi
- Member (GO&D), Central Electricity Authority, Sewa Bhawan, R. K. Puram – New Delhi
- Member Secretary-NRPC/WRPC/SRPC
- Chief Engineer (R&R), MoP, New Delhi
- Chief Engineer (Renewable Policy & Technology Division), CEA, New Delhi
- SLDC- Rajasthan/Maharashtra/MP/Gujarat/Tamil Nadu/Karnataka/AP / Telangana
- RE Developer Association- NSEFI/WIPPA/SPDA/IWPA
- Chairman & Managing Director, Grid-India, New Delhi
- Executive Director NLDC/NRLDC/WRLDC/SRLDC, Grid-India



भारत सरकार
Government of India

विद्युत् मंत्रालय
Ministry of Power
केंद्रीय विद्युत् प्राधिकरण
Central Electricity Authority

सेवा भवन, आर.के.पुरम, नई दिल्ली - 110 066

Sewa Bhawan, RK Puram, New Delhi - 110 066

ई-मेल/ E-mail: secretary.cea@nic.in; दूरभाष/ Phone No.: 011-26732203

No. CEA/PLG/RP&T/15/11/2024/21-25

दिनांक/ Date: 7th July, 2025

To,

1. Principal Secretary/ Secretary(Power/Energy) of all State Governments/UTs.
2. Head REIAs.
3. Solar Power Developers Association.
4. Wind Power Developers Association.
5. CMD, Grid Controller of India.

Subject: CEA Guidelines for Automatic Weather Stations for Solar and Wind Power Plants.

Sir/Madam,

As you are aware that solar and wind generation depends on weather conditions. There are issues of not getting accurate weather forecast. Many a time, forecasting errors result in significant financial penalties under the Deviation Settlement Mechanism.

2. Accurate measurement of critical meteorological parameters would optimize RE generation. Also, it would improve overall generation predictability, efficiency, enhance grid reliability and ensure regulatory compliance.

3. In view of above, there is need to install Automatic Weather Stations in Solar and Wind Power Plants. Accordingly, CEA has prepared the Guidelines for the same.

4. A copy of "CEA Guidelines for Automatic Weather Stations for Solar and Wind Power Plants" is enclosed for necessary action please.

5. Further, all Renewable Energy Implementing Agencies are requested to suitably include the requirement of Automatic Weather Stations in bid documents.

भवदीय/ Yours faithfully,

संलग्नक/ Encl.: as above.

रकेश
07/07/2025

(रकेश कुमार/ Rakesh Kumar)
सचिव/ Secretary

प्रति/ Copy to:

1. Secretary, Ministry of Power.
2. Secretary, Ministry of New & Renewable Energy.
3. Secretary, Ministry of Earth Sciences.

**CEA Guidelines for Automatic Weather Stations (AWS)
for Solar and Wind Power Plants
(July-2025)**

CEA Guidelines for Automatic Weather Stations (AWS) for Solar and Wind Power Plants

1. Objective

Measurement of critical meteorological parameters for accurate, real-time measurement of weather to enable optimization of RE generation. This would improve overall generation predictability, efficiency, enhance grid reliability and ensure regulatory compliance.

2. Location and Site Preparation for Installation of AWS

The Automatic Weather Station (AWS) should be installed at a location within the renewable energy project site. For **solar power plants**, the AWS should be located in terrain that closely resembles the overall site conditions, with irradiance sensors mounted at the **same tilt and orientation** as the photovoltaic modules. For **wind power projects**, the AWS must be positioned in areas that reflect the true wind regime of the site, turbulence zones, or artificial barriers.

Typically, one AWS per RE plant is to be installed for 50 MW and above RE (or as per respective SERC regulation) capacity connected at intra state network and ISTS connected RE plants shall be governed by respective regulations of CERC.

The area of the AWS site should be 10 m x 10m. The site should be levelled and made free of obstructions such as buildings, structures, trees, bushes or equipment that could cause shading, turbulence, or other local interference. Herbicide should be sprayed and sites should be cleaned.

2.1 Fencing for the AWS site with Gate

- a) The height of the fencing for the AWS site (10 m X 10 m) must be 1.5 meters from the ground level.
- b) The fencing angle should be of size 50 mm x 50 mm x 6 mm and pre-coated with red-oxide. Length of the angle shall be 2.5 meters i.e. (0.5 m below ground level). Each angle shall be grouted in concrete blocks of size (0.5 m x 0.5 m x 0.5 m). Angle iron should be painted with 2 coating of synthetic enamel paint.
- c) Two MS angles must be used diagonally at each of the four corner angles of the site.
- d) Distance between each fencing angle should not be more than 2 m.

2.2 Chainlink Fencing

- a) Dimensions of GI Chain link: 10 cm x 10 cm and of Gauge: 10 (3 mm diameter).
- b) GI chainlink mesh must be stretched on the fencing angles.
- c) Entry Gate Dimensions: 2 m x 1 m x 6 mm (Length x Width x Thickness) of MS angle with locking facility and painted with white/ silver colour.

2.3 Mast Specification for AWS

- a) The mast shall be 10 m in height and tiltable which is made of anodized Aluminum alloy suitable for coastal stations.
- b) Three stainless steel guy wires (rust proof) support is to be provided for the mast.

- c) The mast shall be painted in red and white colour scheme.
- d) Concrete Platform for the mast should be 2.0 ft x 2 ft (length x width) and 4 ft height (3.0 ft below ground level and 1.0 ft. above the ground level). All concrete shall be in ratio of 1:1.5:3 and well compacted after being laid.

2.4 Rain Gauge foundation

The Rain gauge foundation must be of dimensions 1 ft x 1ft (length x width) and 2ft height (1.0 ft below ground level and 1.0 ft above the ground level).

2.5 Earthing for signal ground and Lightning Arrestor

1. All AWS stations shall be provided with 2 earth pits - one for signal earth, and another for lightning arrestor.
2. AWS Data Acquisition System (DAS) enclosure should be grounded with local earthing.
3. The earth pits shall ensure 100 % protection for all sensors and systems from severe lightning.
4. The lightning arrestor rod shall be made of copper and mounted on the top of the AWS tower. It should be of thickness 12 mm and of one-meter length with a connected copper wire of dimension 15-meter length and 6 mm thickness (gauge). At the other end of the copper wire is earthing rod of dimensions 15 mm in thickness and 1.8m in length, which is about 1.8 m deep-buried into the ground. On the bottom of earthing rod, one copper plate of dimension (30 cm x 30 cm x 3 mm) should be connected.

2.6 Sensor Installation

- a) A rain gauge sensor will be installed at a distance of 3 meters from the tower.
- b) The Ambient Temperature/Relative Humidity sensors shall be installed on the horizontal boom of 1.5 m fixed at 2 m height on the 10 m Tilttable mast.
- c) Ultrasonic wind sensors will be installed on the horizontal boom of 1.5 m fixed at 10 m height on the 10 m Tilttable mast.
- d) Pressure sensor will be kept inside the Enclosure of Datalogger.

3. Measuring Parameters

AWS shall be capable of measuring the following parameters and converting them to digital format for transmission to the Data Acquisition System (DAS).

3.1. Parameters for Wind Plants for developing NWP model

- a) Barometric Pressure (Pascal)
- b) Ambient Air Temperature (°C)
- c) Wind Speed (meter/second)
- d) Wind Direction (degrees from true north)
- e) Relative Humidity (%)

3.2. Parameters as per CERC/SERC regulations for Solar Plants

- a) Global Horizontal Irradiance (GHI) - Watt per meter square
- b) Global Inclined Irradiance (GII)- Watt per meter square
- c) Rainfall (mm)

4. Technical Specifications

4.1 Specifications of Sensors

4.1.1	Pyranometer for measurement of GHI and GII	
I)	Sensor Type	Thermopile-based Pyranometer
a)	Spectral Range	285 to 3000 nm
b)	Measurement range	0 to 2000 W/m ²
c)	Response time	≤ 5 seconds
d)	Sensitivity	5 to 20 μV/W·m ²
e)	Non-linearity	< ±0.5%
f)	Directional Error (up to 80°)	< ±10 W/m ²
g)	Temperature Response	< ±2%
h)	Operating Temperature Range	−20°C to +60°C
i)	Output	Digital/Analog
j)	Protection Level (Housing)	IP 65 or above
4.1.2	Temperature and Humidity Sensor with Radiation Shield	
I)	Temperature	
a)	Measurement Range	−40°C to +60°C
b)	Resolution	0.01°C or better
c)	Accuracy	± 0.35 °C or better
II)	Relative Humidity	
a)	Measurement Range	0 to 100%
b)	Resolution	0.1%
c)	Accuracy	± 3% or better
III)	Output	Digital/Analog
IV)	Radiation Shield	
a)	Type	Thermoplastic
b)	Louvered	Minimum 9
c)	Ventilation	Natural
4.1.3	Ultrasonic Wind sensors	
I)	Wind speed	
a)	Measurement Range	0 to 75 m/s or better
b)	Resolution	0.01 m/s or better
c)	Accuracy	± 2% or better
d)	Threshold	0.01 m/s
II)	Wind Direction	
a)	Measurement Range	0 to 359.9°
b)	Accuracy	± 3° or better
c)	Resolution	1°
III)	Protection level Housing	IP65 or above
IV)	Output	Digital
4.1.4	Atmospheric Pressure Sensors	
a)	Measurement Range	60000 Pa to 110000 Pa
b)	Resolution	10 Pa
c)	Accuracy	± 20 Pa
d)	Output	Digital

4.1.5	Siphon Tipping Bucket Rain Gauge sensor	
I)	Sensor type	Siphon control mechanism with dual switch with varistor protection and Tipping Bucket
a)	Orifice Size/ collector diameter	The specified diameter of the collector rim should be 200 mm
b)	Collector Area	The specified Collector Area should be 314 cm ²
c)	Switch	Rugged Magnetic Proximity
d)	Resolution	0.5 mm per tip or better
e)	Output	0.1 sec switch closure
f)	Rainfall capacity	Unlimited
g)	Accuracy	±2% or better, for rain rate up to 25 mm/hr ±3% or better, for rain rate between 25mm/hr to 50 mm/hr ±4% or better, for rain rate between 50mm/hr to 100 mm/hr ±5% or better, for rain rate >100 mm/hr
h)	Material of Outer Body/housing (Base/Collector)	Any one of the following: 1. Marine grade stainless steel 2. Fibre glass Reinforced Plastic (FRP) 3. UV resistant ABS plastic 4. Anodized Aluminum alloy (Al 99.5 grade)
i)	Levelling	Suitable levelling adjustment screws and circular spirit level must be provided on the base of TBRG for levelling the Tipping bucket Mechanism.
j)	Debris protection filter	Suitable (Wire mesh) debris protection filter should be provided inside the collector.

4.2 Data Acquisition System (DAS)

4.2.1. Hardware Capabilities

- The DAS should support inputs (analogue, digital), counters, frequency, and quadrature /shaft encoder.
- All the Analog, Digital and SDI-12 channels in the DAS must be compatible with the sensors installed and integrated with the system.
- The DAS should have provision to interface all the sensors installed at the site and able to accept all sensor inputs without external signal conditioning.
- To facilitate data processing, the DAS shall have a provision for a 24-hour Real-Time Clock (RTC) powered by a battery (with minimum one-year lifetime) to ensure that time is maintained even during power outages.
- DAS system should have the functionality of time synchronization to a satellite-based reference time source, preferably NAVIC, isolated from internet.

- f) DAS should have a keypad (Non-touch screen) and a backlit LCD/LED display (internal/external unit) with menu-driven facility to display the command and data characters.
- g) DAS should have a suitable port to interface with any external display unit.
- h) The DAS should have the capability to store at least 30 days data for specified parameters in distinct multiple log files for each sensor and other related parameters.
- i) The data stored in DAS should be in encrypted form (AES 256 bit algorithm or higher) to ensure its confidentiality with following measures:
 - 1. Access to data stored in DAS shall be restricted to only authorized personnel based on principle of AAA mechanism.
 - 2. Retrieval of such encrypted data shall be in a standard format and restricted through Serial port / Ethernet port only to a dedicated, whitelisted and sanitized PC / laptop, without the requirement of any additional software, over and above the application software deployed for DAS. Further, shall ensure that flow of such data shall be unidirectional only i.e. from DAS to such external device but not reverse.
- j) The DAS shall have the facility to sample the output of the attached sensors with user-selectable sampling intervals.
- k) The DAS shall have provision to easily include and change the “Unique station identification code”, “Station Name”, “Time of observation and transmission”, “Measurement schedule” and “Sensor identification information”, for all parameters, as mandatory requirements. Any change in the DAS should be properly logged along with user, date and time details and:
 - 1. Such logs shall be retained for minimum period of 180 days.
 - 2. A record of all changes implemented in DAS shall be maintained.

4.2.2. Communication Capabilities

- a) The DAS shall have a dedicated sealable slot for accommodating plug-in type bi-directional communication module which shall integrate the respective cellular technology (3G/4G/5G / cellular network compatible) with the DAS, leading to seamless exchange of data with National Centre for Medium Range Weather Forecasting (NCMRWF). The Plug-In module shall be field swappable/ replaceable.
The DAS shall ensure that such exchange of real time information and data thereof over Cellular network, shall be over secured connection, subject to condition that such exchange of sensitive information and data thereof over such connection shall be encrypted to ensure its confidentiality, integrity and privacy.
- b) DAS shall have provision to integrate with local plant level SCADA system on MODBUS/IEC-104 through TCP/IP communications. Redundant ports for IEC-104/MODBUS communication shall be available in the system. Also, ensure the following:

1. The interconnection of DAS system with the SCADA is permitted on the basis of risk assessment and approval of head or board of utility, as applicable.
 2. The deployment of suitable perimeter level cyber security devices, including firewall, at point of interconnection of DAS with SCADA systems such that the deployed security system meets the requirements of, inter alia, detection and filtering of OT related protocols as well as traffic; content, user and application based filtering; deep packet inspection, intrusion detection; geo-fencing; user controlled updates; detection based on signature and behavioral anomalies and filtering thereof.
 3. The continuous monitoring of such interconnection for detection of malicious activities and corrective measures thereof.
 4. The logs associated with such interconnection shall be retained for a period of 180 days.
- c) The remote access if required to DAS, may be permitted for meeting emergency and troubleshooting requirements. Also, ensure the following:
1. The remote access to cyber assets, if necessary, may be permitted only for troubleshooting and emergency requirements, as per an established procedure.
 2. This remote access may be granted after conducting a comprehensive risk assessment along with identification of effective measures thereof and such access shall be continuously monitored to detect any anomaly or unauthorized attempts.
 3. Such remote access is safe and secured through suitable control measures including minimum duration with least privileges, multi-factor authentication and geo-fencing.
- d) The protocol details of data transmission (every minute of logged data) through this port have to be documented properly so that any authorized user can interface their device/ display unit.

4.2.2.1. Modem for Cellular Communication (GPRS, 3G,4G,5G compatibility with dual SIM Facility):

A 5G/4G-based Modem (compatible with 3G) with dual SIM facility having provision of fast and reliable wireless data communications along with support for IP-based access to the central server IP. The Modem shall be compatible with all service providers' SIM. The following technical specifications are indicative:

- a) Cellular communication facility with fast and reliable wireless data communications.
- b) Remote dial-up facility.
- c) Shall support SFTP.
- d) Accept dual standard SIM cards.
- e) Ethernet/RS 232/485 interface with DAS.

- f) Indication of network availability (signal strength).
- g) Suitable High gain Antenna for reliable communication.

In future, if any of this technology becomes obsolete, the same should be replaced with the higher version available without any data gap. Both the SIMs should not be of the same generation and the higher should be compatible with the lower generation.

4.2.3. Data Sampling

- a) The sampling and measurement interval for individual parameters shall also be user selectable.
- b) Provision of disseminating the data from AWS site at an interval of 15 minutes; but can be changed (by manual process only) to 1 minute whenever required during extreme weather event and heavy rainfall seasons. In case of requirement of remote access, the same shall be permitted as per established procedure for ensuring remote access, as stated in clause number 4.2.2 (c).

4.2.4. Data Quality Control(QC)

- a) The DAS should have a facility to apply Quality Control procedures such as Gross error checks and time consistency checks for sensors interfaced. Detailed QC procedures and algorithms proposed to be implemented at field sites shall be in accordance with WMO No.8 “Guide to Meteorological Instruments and Methods of Observation” Part-III Chapter 1 and Part-II Chapter 1, Seventh Edition, 2008.
- b) Data quality control has to be applied as real-time QC performed at the Data-logger of AWS.
- c) **QC of raw data (signal measurements):** The basic QC is performed at an AWS site. This QC level is relevant during the acquisition of Level I data and should eliminate errors of technical devices, including sensors, measurement errors (systematic or random), and errors inherent in. Some errors introduced during the measuring process must be eliminated.
- d) **Plausible value check (The gross error check on measured value):** Each sample should be examined to check if its value lies within the measurement range of a particular station. If the value fails the check, it is rejected and not used in the further computation of the relevant parameter.
- e) **Check on Plausible rate of change (The time consistency check on measured values):** This check is to verify the rate of change (unrealistic jumps in the values). After each signal measurement, the current sample shall be compared to the preceding one. If the difference between these two samples is more than the specified limit then the current sample is identified as a suspect and not used for the computation of the average. However, it is still used for checking the temporal consistency of the sample.
- f) **Check on Inter-sensor checks:** Internal consistency checks of a variable against other variables, based upon established physical and meteorological principles.

4.2.5. Cyber Security

- a) The DAS should be adequately protected through Firewall using IDS system and Deep Packet Inspection facility and whitelisting of IPs connected through cellular network may be enabled.
- b) All Data & Logs must be suitably maintained for reproduction if needed for forensic analysis for a minimum period of 180 days as per CERT-In Direction.
- c) User settings, credentials, authentications must be stored in encrypted format.
- d) Data transferred through cellular network (3G/4G/GPRS) must be over secured connection, and be suitably encrypted while in transit to ensure its confidentiality, integrity and privacy.
- e) Cyber Security controls as per CEA Guidelines 2021 or amendments thereof may be adhered especially for the IP based communicable devices.

4.3 Power Supply

The complete AWS station shall have the capability for unattended operation at remote places using Maintenance Free (MF) Battery, Solar Charge controller (Maximum Power Point Tracker) and rechargeable through a Solar panel .

- (i) Battery: Suitable capacity MF (Maintenance Free Battery).
- (ii) Solar Charge controller: It should charge the supplied Sealed Maintenance Free (SMF) battery with a suitable solar panel and also overload protection, Short circuit protection, Protection from the lightning strike and Under-voltage protection.
- (iii) Solar Panel: Suitable solar panel to charge the SMF battery.

4.4 Weatherproof FRP enclosure

- a) Two separate enclosures are required for AWS. Weatherproof Enclosure of AWS should be FRP Enclosure (IP 66) and for outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water.
- c) One enclosure FRP Enclosure (IP 66) suitable to keep Datalogger, solar charge Controller and switch with the suitable fuse for power supply to the Data logger and UHF Transmitter.
- d) Another separate FRP Enclosure (IP 66) for MF batteries.
- e) Silicone gasket is used for both Enclosures in harsh environments and extreme temperatures.
- f) FRP Enclosure (IP 66) enclosures should be designed for outdoor applications that require corrosion protection against chemicals and water. From humble to harsh environments, it safeguards vital electrical and electronic components with enclosures, climate control and accessories to help keep operations up and running smoothly.
- g) Enclosure with hinged door and locking facility.
- h) Data Pockets provide convenient storage for wiring diagrams, operation manuals and other documentation inside an enclosure.

5. System Configuration of AWS

- a) The AWS equipment along with the data communication system should incorporate state-of-the-art technology and provide the capability for unattended operation in all weather conditions. The system shall run using Maintenance Free (MF) battery(s), rechargeable through a solar panel. The battery shall be capable to run the system for a minimum period of 20 days on full load during total cloudy or foggy conditions without charging through the solar panel.
- b) Transmission of data at user-defined measurement schedule from field stations using mobile telemetry over cellular network (GPRS/3G/4G/5G etc.) shall be over secured connection, using SFTP (Secure File Transfer protocol), simultaneously to at least two static whitelisted IP addresses in file format compatible with requirements of NCMRWF and ensure uninterrupted reception and archival of data at the central data server located at NCMRWF/Indian Meteorological Department (IMD).
- c) Integration of AWS data to local plant SCADA system installed at site as per clause number 4.2.2 (b).
- d) The AWS data (.csv format) shall also be received at IMD/NCMRWF Central Server via SFTP service facility as per user-defined time interval (1 min to 15 min).

6. AWS Data sharing

Data from the AWS site shall be transmitted through the cellular network modem following IMD Mobile Telemetry protocol and its data format to NCMRWF.

7. Suitable provisions for testing, calibration & maintenance of AWS shall be specified by IMD.

-----X-----X-----

STANDARD OPERATING PROCEDURE FOR AWS MAINTENANCE AND ITS SENSORS CALIBRATION

- A. AWS maintenance shall cover on-site maintenance of the hardware, software, sensors, electronics and all civil work. The following maintenance mechanism is proposed under IMD
- a) **Preventive Maintenance:** Preventive maintenance should be done quarterly and once every month for the four monsoon months (June to September).
 - b) **Corrective Maintenance:** Corrective maintenance should be on call there is no constraints. Corrective maintenance must be attended within 2 working days from the day of fault/breakdown reported
 - c) **Adaptive Maintenance:** Adaptive maintenance is required to consider the rapid changes in technology and the availability of spare parts after a few years.
 - d) **Calibration-** Both field inspection with traveling standards and laboratory inspection will be conducted at regular interval. For faster and quicker movement and response, spare parts sub-inventory needs to maintain at cluster level. Ensure that, you are always maintaining 10 % of the spare parts of total cluster in your inventory.

For both, Preventive and Corrective maintenance following guidelines / checklist should be followed.

1. Pre-Maintenance Check List:

The representatives of the thesupplier shall ensure the that:

- a) their mobile battery is fully charged.
- b) they are carrying a toolbox containing all required of maintenance tools.
- c) they have understood the breakdown issue and associated activities.
- d) they are carrying required spare parts and accessories as per the breakdown call.
- e) they have looked upon and are familiar with the operational history of the station to be visited.

2. Maintenance Check List:

Note down and report the overview of physical inspection of the site on hanging of wires, theft/damage of equipment, grass, civil and fencing status, new obstacle raised if any)

3. Sensors:

- a) Ensure that north marking/arrow is aligned to the North direction of the station.
- b) Check wear and tear of the ultrasonic wind sensors

- c) Check ultrasonic connection and ensure its functionality.
- d) Check the ultrasonic cable, if required change the cable.
- e) Clean the anemometer connectors, connect to the DAS and ensure its functionality again.
- f) Ensure that the ATRH (Atmospheric Temperature & Relative Humidity Sensor) sensor is mounted at the height of 1.5 to 2 meter from ground.
- g) Check the connection of the ATRH sensor and ensure its functionality.
- h) Check the ATRH cable. If required change the cable.
- i) Remove ATRH sensor and clean the radiation shield.
- j) Check filter cap of ATRH sensor. if dust accumulated on it change the filter cap. (Filter cap should be replaced after every three months.)
- k) Clean the sensor gently and remove the dust and dirt accumulated on it.
- l) Clean the ATRH connectors.
- m) Ensure that you are installing ATRH sensor at the height of 1.5 to 2 meter from ground.
- n) Check the functionality of ATRH sensor.
- o) Check and compare ATRH sensor's instantaneous measurement with the Whirling Psychrometer's measurements. Take 3 to 5 sets of observations for the comparison. Report all the measurements in Designated mobile application.

This Whirling Psychrometer's should calibrated every year at IMD Pune

4. Inspect the TBRG (Tipping Bucket Rain Gauge) and comment on:

- a) Position of the **TBRG**: Whether it is upright or tilted/leaned
- b) Whether any debris accumulated in the funnel of the TBRG.
- c) Whether the bubble of the level meter is at the centre.
- d) Rusting observed on any part of the TBRG.
- e) Remove the debris from the funnel (if observed any) and clean the funnel.
- f) Remove the rust (if observed any) with the help of spray.
- g) Apply anti rust spray/oil/grease on the rusted part.
- h) Ensure or adjust the level meter bubble at the centre.
- i) Ensure that the buckets are moving freely
- j) Calibrate the bucket with the help of syringe and ensure that both the buckets are tipped on given volume of water.
- k) Ensure that the DAS records and show --- mm rainfall after every tip.

- l) Check the TBRG cable if required change the cable.
- m) Clean the TBRG connectors and ensure the functionality of the TBRG.

5. Power Unit:

- a) Check solar panel connections.
- b) Check and report solar panel voltage.
- c) Check battery connection.
- d) Check and report battery voltage.
- e) Check and report battery output terminal voltage.
- f) Clean and mount the solar panel.
- g) Ensure that the solar panel is mounted on South direction and with proper angle.

6. Communication unit:

- a) Check and report DAS.
- b) Check and report CCID of SIM.
- c) Check antenna connection.
- d) Remove SIM card and clean the slots softly.

7. Post-Maintenance Check List:

- a) Ensure that all the screws are tightened properly.
- b) Ensure that all the clamps are tightened properly.
- c) Ensure that all the cables are neatly tied with cable tie or adhesive tape.
- d) Ensure that you have selected correct location name from the drop-down list of the designated mobile application. Please reconfirm it.
- e) Ensure that you have correctly reported material requirement.
- f) Ensure that you have filled comment section of the application correctly and precisely.
- g) Ensure that you have filled log card properly.
- h) Check the stations communication with the server by reporting to your reporting manager.

8. Submission:

- a) Ensure and confirm that all the fields in the maintenance report are filled completely.
- b) Submit duly filled maintenance report to server. (Server will not accept partially filled report)

- c) Site Leaving Permit (SLP) will be generated in the application after the successful submission of the maintenance report.
- d) If it is not generated automatically, ask your reporting manager to generate the permit for leaving the site. Without this permit field engineers are not allowed to leave the site.

9. Important Aspects

- a) For maintenance and supervision, a service engineer shall be deputed at AWS site level.
- b) Service provider will perform the preventive maintenance of AWS, before, during and after the onset of Monsoons, this would be mandatory and, part of routine check.
- c) Response time, for emergency maintenance shouldn't be more than 3 days, in any case. SLA shall be followed.
- d) Government of India or respective state government should be provided access to online maintenance logs on a web portal for the maintenance of AWS.

*Annexure-I***FORMAT FOR AWS / ARG / ASG COMMISSIONING REPORT**

S.No.	Parameter		Details	Remarks
A	Automatic Weather Station (AWS) - General Information			
A1	AWS Unique ID	:		
A2	AWS Pin code	:		
A3	AWS Latitude	:	<Degree Decimal, up to 5 decimal Places>	
A4	AWS Longitude	:	<Degree Decimal, up to 5 decimal Places>	
A5	Name of the State	:		
A6	Name of the District	:		
A7	Name of the Sub-District/Taluka/Block	:		
A8	Name of the Revenue Circle	:		
A9	Name of the Gram Panchayat	:		
A10	Name of the Village	:		
A11	Name of the Local Nodal officer	:		
A12	Station Established and Maintained	:		
A13	Land Provided	:		

S.No.	Parameter		Details	Remarks
A14	NOC available		<DD/MM/YYYY>	
A15	Station Commissioned On <Date & Time>	:	<DD/MM/YYYY>	
B	Siting & Civil Work			
B1	AWS Area	:		
B2	Whether Plot Size Conforms with IMD Guidelines: i) AWS - 10m * 10m	:	<YES/NO>	
B3	If Plot Size does not conform with IMD Guidelines, Reason along with requisite Approval as per IMD	:	<Hilly/Undulated Terrain, Unavailability of Space etc.>	
		:	Option to Upload Document/Photograph	
B4	Is the Surface Levelled	:	<YES/NO>	
B5	Whether site surrounded by bushes, unplanned tree growth, high- tension wires other obstructions which may hamper working of the AWS	:	<YES/NO>	
B6	Whether proper earthing installed	:	<YES/NO>	
B7	North Direction Identified and Marked on Mounting Mast and Foundation	:	<YES/NO>	
B6	Mounting Mast			
i	Proper Foundation laid with RCC of 1:2:4, 3 feet below ground level to 1 feet above ground level	:	<YES/NO>	
ii	10 m Tilttable Mast for mounting the sensors made up of Aluminium material	:	<YES/NO>	

S.No.	Parameter		Details	Remarks
	of 1.5-inch diameter and gauge 2 or better			
iii	Mounting mast is upright and at 90° w.r.t the ground	:	<YES/NO>	
iv	Height of the Mounting Mast (in meters)	:		
v	Is anchor rod/guy rope installed	:	<YES/NO>	
vi	Height of TBRG Mounting Mast (In meters)	:		
vii	TBRG Mounting mast is upright and making 90° angle to the ground	:		
viii	Whether tilt sensor/clinometer installed	:	<YES/NO>	
B7	Fencing/Chain-link			
i	Height of the Fencing (in meters)	:		
ii	Whether Proper Foundation laid with RCC of 1:2:4, which is 9 inches above ground level	:	<YES/NO>	
iii	Dimensions of the fencing angle foundation (Length=1.0 ft x Width=1.0 ft x Depth=3 ft)	:		
iv	Size of the Fencing Angle (50mm x 50mm x 6mm)	:		
v	Total height of the fencing angle (2.3 meters i.e., 1.5m)	:		

S.No.	Parameter		Details	Remarks
	above ground level + 0.8 m below ground level)			
vi	Distance between fencing angles (1 meter)	:		
vii	Chain-link fencing installed	:		
B8	All metallic components painted with quality-approved anti rust coating paints	:	<YES/NO>	
C	Sensors and Other Equipment			
C1	Deployment Checklist			
i	Ultrasonic wind sensors is installed at top of the Mast (10 m above ground level)	:	<YES/NO>	
ii	Height of Temperature and Relative humidity Sensor (1.5m to 2m) (in meters)	:		
iii	Temperature and Relative humidity Sensor Installed with Radiation Shield	:	<YES/NO>	
iv	Height of Pressure Sensor (1.5) (in meters)	:		
v	Pressure Sensor Installed inside the enclosure	:	<YES/NO>	
vi	Height of TBRG (at least 30 cm above surface)	:		
vii	Data logger installed at a suitable height	:	<YES/NO>	

S.No.	Parameter		Details	Remarks
	without disturbing sensors position			
viii	All the Sensors are connected to the Data Logger	:	<YES/NO>	
ix	Are the cables neatly tied with cable-tie and adhesive tape/conduit	:	<YES/NO>	
x	Is tilt sensor/clinometer installed on AWS mast	:	<YES/NO>	
C2	Post-Deployment Checklist			
i	Check temperature and humidity readings and compare with reference sensor	:		Provision for taking five set of observations for the comparison
ii	Check relative atmospheric pressure readings and compare with reference sensor	:		
iii	Check Wind Speed readings and compare with reference sensor	:		
iv	Check Wind Direction readings and compare with reference sensor	:		
v	Siphon TBRG - Bucket lock/tie is open, and its movement is free	:	<YES/NO>	Provision for taking five set of observations for the comparison
vi	Siphon TBRG - Levelling bubble is at centre position	:	<YES/NO>	
vii	Siphon TBRG - both the buckets are tipping on accumulation of -- ml of water in it	:	<YES/NO>	

S.No.	Parameter		Details	Remarks
viii	Siphon TBRG - after every tip data logger shows ---rainfall on the DL screen/display	:	<YES/NO>	
D	Reports			
D1	Sensor Calibration Reports by IMD or NABL accredited Laboratories	:	<YES/NO>	
D2	Site Acceptance Test /Commission of AWS SITE based on the comparison of on-site sensors against reference sensor (Travelling standard)	:	<YES/NO>	

Weather Parameters Sanity Report (Jan' 2026 to Mar' 2026)

SOLAR PARAMETERS

SNo.	Pooling Station	Station Name	AMBIENT TEMPERATURE	DIFFUSION IRRADIANCE	DIRECT IRRADIANCE	GHI	RELATIVE HUMIDITY
1	BHADLA	BHADLA - SB ENERGY 4	0.0%	0.0%	0.0%	99.8%	99.9%
2	BHADLA2	ACME HEERAHARH	99.8%	0.0%	0.0%	99.7%	99.8%
3	FTHGR3	RSVPL	99.7%	0.0%	0.0%	99.7%	99.7%
4	BKNR	THAR SOLAR	10.7%	0.0%	0.0%	99.7%	99.9%
5	BHADLA	EPPSP	98.6%	0.0%	0.0%	98.6%	82.4%
6	BHADLA2	KOLAYAT -2	97.3%	0.0%	21.6%	98.6%	98.6%
7	BKNR	SBSR POWER	94.6%	0.0%	0.0%	98.6%	98.6%
8	FTHGR2	ADANI ENERGY 24	98.6%	98.6%	98.6%	98.6%	98.6%
9	RAMAGUNDAM	RAMAGUNDAM	99.8%	0.0%	0.0%	98.6%	98.6%
10	BKNR	AZURE43	99.9%	0.0%	69.6%	97.7%	99.9%
11	PAVAGADA	YARROW	0.0%	0.0%	0.0%	97.5%	0.0%
12	BHADLA	APTFL AZUREPOWER 34	95.9%	18.9%	6.8%	97.3%	97.3%
13	BHADLA	CLEAN SOLAR JODHPUR	94.6%	0.0%	0.0%	97.3%	4.1%
14	BHADLA	MAHOBIA POWER (RAWRA)	95.9%	74.3%	97.3%	97.3%	95.9%
15	BHADLA2	ABC SOLAR	0.0%	0.0%	0.0%	97.3%	87.8%
16	BHADLA2	ADANI ENERGY 25	97.3%	97.3%	97.3%	97.3%	97.3%
17	BKNR	AVAADA 300	94.6%	95.9%	4.1%	97.3%	74.3%
18	BKNR	AVAADA 350	93.2%	4.1%	0.0%	97.3%	97.3%
19	BKNR	AVAADA RAJHANS 240	93.2%	10.8%	0.0%	97.3%	97.3%
20	BKNR	THAR SOLAR	87.8%	0.0%	0.0%	97.3%	97.3%
21	FTHGR2	ADANI RENEWBALLES	95.9%	0.0%	0.0%	97.3%	97.3%
22	FTHGR3	RSRPL	98.6%	98.6%	0.0%	97.3%	97.3%
23	TUTICORIN	GRT JEWELLERS	94.6%	0.0%	0.0%	97.3%	97.3%
24	BHADLA	ACME	78.4%	95.9%	95.9%	95.9%	23.0%
25	BHADLA	BHADLA - CSPR1	94.6%	0.0%	0.0%	95.9%	95.9%
26	BHADLA2	ASEPL	97.3%	95.9%	0.0%	95.9%	97.3%
27	BKNR2	ASSPL	90.5%	6.8%	6.8%	95.9%	4.1%
28	BKNR2	SERENTICA	95.9%	0.0%	0.0%	95.9%	97.3%
29	FTHGR2	ADANI JAISALMER SOLAR	95.9%	0.0%	0.0%	95.9%	95.9%
30	BHADLA2	AMP ENERGY GREEN	0.0%	0.0%	0.0%	95.5%	0.0%
31	BHADLA	BHADLA - CSPR2	94.6%	0.0%	0.0%	94.6%	94.6%
32	BHADLA	BHADLA - SB ENERGY 4	0.0%	0.0%	0.0%	94.6%	94.6%
33	BKNR2	KBNHPC	93.2%	97.3%	94.6%	94.6%	94.6%
34	FTHGR1	ADANI SOLAR PARK PSS2	93.2%	0.0%	0.0%	94.6%	24.3%
35	FTHGR3	RSAPL	21.6%	95.9%	0.0%	94.6%	21.6%
36	TUTICORIN	ETTAYAPURAM	98.6%	0.0%	0.0%	94.6%	97.3%
37	BHADLA2	ACME HEERAHARH	91.9%	0.0%	0.0%	93.2%	91.9%
38	BHADLA2	GORBEA SOLAR	0.0%	0.0%	94.6%	93.2%	95.9%
39	BKNR	RENEW MERCHANT	89.2%	0.0%	0.0%	93.2%	93.2%
40	FTHGR2	RENEW SUN BRIGHT	89.2%	0.0%	0.0%	93.2%	90.5%
41	BKNR	RENEW MERCHANT	92.9%	0.0%	0.0%	93.0%	92.9%
42	BHADLA2	AMP ENERGY GREEN	0.0%	0.0%	0.0%	91.9%	0.0%
43	BKNR	AZURE43	90.5%	10.8%	91.9%	91.9%	91.9%
44	BKNR	TATA POWER GREEN	45.9%	0.0%	0.0%	91.9%	48.6%
45	BKNR2	AAPL	89.2%	41.9%	0.0%	91.9%	93.2%
46	BKNR2	OVEPL IP	93.2%	90.5%	0.0%	91.9%	93.2%
47	FTHGR1	DEOGARH	82.4%	8.1%	0.0%	91.9%	91.9%
48	FTHGR1	PHALODI	86.5%	8.1%	9.5%	91.9%	91.9%
49	BHADLA2	AMP ENERGY GREEN 5	89.2%	86.5%	0.0%	90.5%	78.4%
50	RADHANESHDA	GIPCL	91.9%	6.8%	90.5%	90.5%	91.9%
51	REWA	BARSATA DESH	58.1%	0.0%	0.0%	90.5%	58.1%
52	BKNR2	GEPL IP	0.0%	0.0%	0.0%	89.2%	27.0%
53	FTHGR2	RENEW SOLAR URJA	29.7%	0.0%	0.0%	87.8%	33.8%
54	FTHGR3	RSVPL	87.8%	0.0%	0.0%	87.8%	87.8%
55	RADHANESHDA	ENGIE	87.8%	32.4%	91.9%	87.8%	87.8%
56	BHADLA	MAHOBIA POWER (RAWRA)	96.5%	51.7%	84.9%	87.0%	96.5%

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57	REWA	BARSAITA DESH	30.1%	0.0%	0.0%	86.7%	30.1%
58	BHADLA2	RISING SOLAR	0.0%	0.0%	0.0%	86.5%	85.1%
59	BKNR	ARP3PL	86.5%	0.0%	0.0%	86.5%	87.8%
60	PAVAGADA	SOFT BANK	86.5%	0.0%	0.0%	86.5%	86.5%
61	FTHGR1	ADANI SOLAR PARK PSS 1	93.2%	0.0%	0.0%	85.1%	97.3%
62	PAVAGADA	YARROW	67.6%	0.0%	0.0%	83.8%	67.6%
63	BHADLA	BHADLA - SB ENERGY 5	90.5%	91.9%	91.9%	82.4%	91.9%
64	FTHGR2	RENEW JHARKHAND	85.1%	0.0%	0.0%	82.4%	89.2%
65	PAVAGADA	AMPLUS TUMKUR	90.5%	0.0%	0.0%	82.4%	90.5%
66	BHADLA	BHADLA - CSPR3	81.1%	0.0%	0.0%	81.1%	81.1%
67	FTHGR2	EDEN	81.1%	81.1%	4.1%	81.1%	81.1%
68	BHADLA	BHADLA-P6	0.0%	0.0%	0.0%	79.7%	0.0%
69	BHADLA	TATA POWER	78.4%	79.7%	41.9%	79.7%	79.7%
70	BKNR2	PGPL	77.0%	0.0%	0.0%	79.7%	55.4%
71	NP KUNTA	ACME BHIWADI	82.4%	0.0%	0.0%	79.7%	0.0%
72	BHADLA	EPPSP	99.8%	0.0%	0.0%	78.6%	98.6%
73	BHADLA	CLEAN SOLAR JODHPUR	99.9%	0.0%	0.0%	77.7%	0.0%
74	FTHGR2	ADANI RENEWBALES	99.8%	0.0%	0.0%	77.5%	99.8%
75	BKNR2	SGEL (SJVN)	36.5%	75.7%	74.3%	75.7%	36.5%
76	KHANDWA	KANWANI	77.0%	77.0%	75.7%	75.7%	1.4%
77	NP KUNTA	SPRING SOLAR	55.4%	0.0%	0.0%	74.3%	74.3%
78	PAVAGADA	RENEW	75.7%	0.0%	0.0%	74.3%	75.7%
79	FTHGR1	DHAULPUR	62.2%	0.0%	8.1%	71.6%	71.6%
80	FTHGR1	RAISER	64.9%	8.1%	8.1%	71.6%	71.6%
81	FTHGR3	RSAPL	8.2%	99.8%	0.0%	70.7%	8.2%
82	RAMAGUNDAM	RAMAGUNDAM	100.0%	0.0%	0.0%	70.3%	100.0%
83	PAVAGADA	RENEW	98.5%	0.0%	0.0%	68.6%	98.5%
84	SOLAPUR NTPC	SOLAPUR NTPC	64.9%	55.4%	55.4%	66.2%	66.2%
85	SIMHADRI	SIMHADRI FLOATING SOLAR	66.2%	0.0%	0.0%	66.2%	66.2%
86	FTHGR3	AXPPL	94.6%	6.8%	0.0%	64.9%	94.6%
87	BKNR	AYANNA	62.2%	0.0%	0.0%	63.5%	63.5%
88	KAWAS	KAWAS	2.7%	14.9%	14.9%	63.5%	70.3%
89	BKNR2	TPSB	71.6%	0.0%	0.0%	62.2%	71.6%
90	PAVAGADA	FORTUM SOLAR	8.1%	0.0%	0.0%	60.8%	60.8%
91	FTHGR3	RSRPL	99.8%	99.8%	0.0%	59.6%	99.8%
92	REWA	RAMNAGAR (ATHENA)	5.4%	0.0%	0.0%	59.5%	66.2%
93	BHADLA	ACME	99.9%	99.9%	99.9%	58.3%	8.2%
94	FTHGR2	RENEW SOLAR URJA	3.9%	0.0%	0.0%	56.4%	3.9%
95	PAVAGADA	SOFT BANK	98.5%	0.0%	0.0%	54.1%	98.5%
96	SIMHADRI	SIMHADRI FLOATING SOLAR	99.8%	0.0%	0.0%	53.8%	99.6%
97	FTHGR2	RENEW SUN BRIGHT	55.6%	0.0%	0.0%	53.6%	55.6%
98	TUTICORIN	GRT JEWELLERS	82.5%	0.0%	0.0%	53.6%	60.9%
99	FTHGR2	ADANI ENERGY 24	99.9%	55.0%	96.1%	53.3%	99.9%
100	PAVAGADA	AMPLUS TUMKUR	98.4%	0.0%	0.0%	53.3%	98.4%
101	FTHGR2	DEVIKOT	52.7%	5.4%	5.4%	52.7%	52.7%
102	FTHGR2	ADANI HYBRID-3	99.9%	0.0%	0.0%	52.6%	99.9%
103	FTHGR1	ADANI SOLAR PARK PSS 1	99.9%	0.0%	0.0%	52.4%	99.9%
104	FTHGR2	ADANI HYBRID-2	99.9%	0.0%	0.0%	52.3%	99.9%
105	FTHGR2	ADANI HYBRID	96.6%	0.0%	0.0%	52.0%	96.6%
106	FTHGR2	ADANI JAISALMER SOLAR	99.7%	0.0%	0.0%	51.7%	99.7%
107	BHADLA	BHADLA - CSPR1	99.9%	0.0%	0.0%	51.6%	99.9%
108	BKNR	SBSR POWER	99.9%	0.0%	0.0%	51.6%	99.9%
109	FTHGR1	ADANI SOLAR PARK PSS2	99.9%	0.0%	0.0%	51.6%	8.2%
110	TUTICORIN	ETTAYAPURAM	99.6%	0.0%	0.0%	51.4%	98.5%
111	FTHGR3	NRSVPL	58.1%	28.4%	17.6%	51.4%	54.1%
112	BHADLA	BHADLA - CSPR3	99.9%	0.0%	0.0%	51.2%	99.9%
113	BKNR	AYANNA	99.7%	0.0%	0.0%	51.0%	99.7%
114	BKNR2	JGCPL	99.9%	51.4%	49.7%	51.0%	99.9%
115	BHADLA2	KOLAYAT -2	99.5%	3.9%	8.2%	50.9%	99.5%
116	BKNR2	SERENTICA	97.7%	0.0%	0.0%	50.9%	97.7%
117	BHADLA2	GORBEA SOLAR	0.0%	0.0%	42.0%	50.8%	97.2%
118	FTHGR1	PHALODI	99.9%	0.0%	0.0%	50.8%	99.9%
119	BKNR	ARP3PL	99.9%	0.0%	0.0%	50.7%	99.9%

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120	BKNR2	AAPL	99.8%	0.0%	0.0%	50.7%	99.8%
121	BHADLA2	RSDCLP2	99.9%	52.2%	45.2%	50.6%	99.9%
122	FTHGR2	EDEN	99.9%	50.7%	28.8%	50.5%	99.9%
123	RADHANESHDA	GIPCL	98.8%	0.0%	50.1%	50.5%	98.8%
124	BHADLA2	MEGA SURYA URJA	99.7%	0.0%	0.0%	50.4%	99.7%
125	BHADLA2	RISING SOLAR	0.0%	0.0%	0.0%	50.3%	99.8%
126	BKNR	AVAADA RAJHANS 240	99.9%	39.1%	0.0%	50.3%	99.9%
127	BKNR2	KBNHPC	99.9%	99.7%	45.1%	50.3%	99.9%
128	BHADLA	BHADLA - CSPR2	99.9%	0.0%	0.0%	50.3%	99.9%
129	BHADLA2	ADANI ENERGY 25	99.7%	51.8%	97.5%	50.3%	99.7%
130	BHADLA2	ASEPL	99.8%	50.3%	0.0%	50.3%	99.8%
131	BKNR	TATA POWER GREEN	8.2%	0.0%	0.0%	50.3%	8.2%
132	BHADLA	TATA POWER	99.7%	50.8%	0.0%	50.2%	99.7%
133	BKNR	AVAADA 300	99.9%	50.9%	0.0%	49.9%	99.9%
134	BKNR2	ASSPL	99.8%	0.0%	0.0%	49.8%	0.0%
135	BKNR	AVAADA 350	98.2%	0.0%	0.0%	49.7%	98.3%
136	BKNR	TATA POWER SURYA	96.3%	0.0%	0.0%	49.7%	96.3%
137	RADHANESHDA	ENGIE	98.8%	51.1%	49.2%	49.4%	98.8%
138	FTHGR1	DEOGARH	96.1%	0.0%	0.0%	49.3%	96.1%
139	BHADLA	AZURE MAPPLE	96.6%	0.0%	0.0%	49.2%	96.6%
140	BHADLA	BHADLA-P6	0.0%	0.0%	0.0%	49.1%	0.0%
141	FTHGR1	DHAULPUR	99.9%	0.0%	0.0%	49.0%	99.9%
142	BHADLA	APTFL AZUREPOWER 34	95.9%	0.0%	0.0%	48.8%	95.5%
143	PAVAGADA	ADYAH	0.0%	0.0%	0.0%	48.4%	0.0%
144	BHADLA	ESUCRL	47.3%	14.9%	0.0%	47.3%	47.3%
145	BHADLA2	AMP ENERGY GREEN 4	85.1%	1.4%	0.0%	47.3%	89.2%
146	BKNR2	PGPL	81.6%	0.0%	0.0%	47.2%	81.0%
147	NP KUNTA	ACME BHIWADI	87.1%	0.0%	0.0%	47.1%	0.0%
148	KAWAS	KAWAS	29.7%	32.2%	33.5%	47.0%	98.7%
149	SOLAPUR NTPC	SOLAPUR NTPC	90.8%	0.0%	0.0%	45.8%	90.9%
150	FTHGR1	RAISER	91.6%	0.0%	0.0%	45.1%	91.6%
151	RADHANESHDA	SJVN	43.2%	41.9%	43.2%	44.6%	41.9%
152	BHADLA	BHADLA - SB ENERGY 5	59.2%	31.7%	26.9%	44.4%	59.2%
153	FTHGR3	AXPPL	96.5%	0.0%	0.0%	44.1%	96.5%
154	BKNR2	SGEL (SJVN)	82.1%	82.4%	54.2%	42.0%	82.1%
155	PAVAGADA	ADYAH	5.4%	0.0%	0.0%	41.9%	5.4%
156	FTHGR3	NRSVPL	43.3%	0.0%	0.0%	41.1%	41.1%
157	BHADLA	ESUCRL	81.3%	8.2%	0.0%	40.9%	81.3%
158	RADHANESHDA	TPREL	73.2%	12.4%	36.3%	39.5%	73.2%
159	PAVAGADA	FORTUM SOLAR	0.0%	0.0%	0.0%	31.1%	47.1%
160	RADHANESHDA	SJVN	91.6%	59.5%	57.0%	29.9%	91.6%
161	FTHGR1	ADANI SOLAR PARK NTPC	29.7%	0.0%	0.0%	29.7%	29.7%
162	NP KUNTA	ACME HISSAR	0.0%	0.0%	0.0%	29.3%	0.0%
163	KHANDWA	KANWANI	54.8%	30.3%	27.4%	28.9%	0.0%
164	NP KUNTA	ACME HISSAR	0.0%	0.0%	0.0%	28.4%	0.0%
165	BKNR2	TPSB	45.7%	0.0%	0.0%	27.4%	45.7%
166	REWA	BADWAR	5.4%	0.0%	0.0%	27.0%	5.4%
167	FTHGR2	RENEW JHARKHAND	56.9%	0.0%	0.0%	27.0%	56.9%
168	BHADLA2	ABC SOLAR	0.0%	0.0%	0.0%	26.8%	99.8%
169	BHADLA	MAHINDRA SOLAR	25.7%	4.1%	4.1%	25.7%	25.7%
170	BHADLA2	KOLAYAT -1	13.5%	21.6%	21.6%	21.6%	0.0%
171	NP KUNTA	TATA POWER	20.3%	0.0%	20.3%	20.3%	0.0%
172	PAVAGADA	KREDL	17.6%	0.0%	0.0%	17.6%	17.6%
173	FTHGR3	RSJPL	55.4%	48.6%	16.2%	16.2%	56.8%
174	PAVAGADA	AVAADA SOLAR	27.0%	0.0%	0.0%	16.2%	27.0%
175	PAVAGADA	AMPLUS PVG	14.5%	0.0%	0.0%	11.5%	14.5%
176	PAVAGADA	AVAADA SOLARISE	93.2%	0.0%	0.0%	10.8%	93.2%
177	BHADLA2	KOLAYAT -1	13.8%	8.2%	8.2%	8.2%	0.0%
178	FTHGR1	ADANI SOLAR PARK NTPC	8.2%	0.0%	0.0%	8.2%	8.2%
179	BKNR	BIKANER(RENEW)	24.3%	0.0%	0.0%	8.1%	24.3%
180	FTHGR3	RSJPL	12.0%	51.6%	42.2%	7.3%	12.0%
181	BHADLA2	NOKHRA	6.9%	0.0%	0.0%	4.5%	6.9%
182	BHADLA	MAHINDRA SOLAR	3.9%	0.0%	0.0%	3.9%	3.9%

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183	FTHGR2	DEVIKOT	5.6%	0.0%	0.0%	3.9%	5.6%
184	KURNOOL	AMGEPL SOLAR	81.1%	0.0%	0.0%	2.7%	86.5%
185	PAVAGADA	FORTUM	2.7%	0.0%	0.0%	2.7%	2.7%
186	BHADLA	AZURE 41	87.8%	0.0%	0.0%	1.4%	89.2%
187	BHADLA	AZURE MAPPLE	93.2%	0.0%	0.0%	1.4%	87.8%
188	BHADLA2	MEGA SURYA URJA	52.7%	0.0%	0.0%	1.4%	52.7%
189	BHADLA2	NOKHRA	98.6%	0.0%	0.0%	1.4%	98.6%
190	BHADLA2	RSDCLP2	86.5%	86.5%	86.5%	1.4%	86.5%
191	BKNR	TATA POWER SURYA	71.6%	0.0%	0.0%	1.4%	56.8%
192	BKNR2	JGCPL	97.3%	1.4%	1.4%	1.4%	98.6%
193	RADHANESHDA	TPREL	50.0%	0.0%	32.4%	1.4%	44.6%
194	PAVAGADA	AMPLUS PVG	1.4%	0.0%	0.0%	1.4%	1.4%
195	BHADLA	RENEW	8.2%	0.0%	0.0%	0.3%	8.2%
196	REWA	BADWAR	0.0%	0.0%	0.0%	0.2%	0.0%
197	BKNR	BIKANER(RENEW)	8.2%	0.3%	0.3%	0.0%	8.2%
198	FTHGR2	RENEW SUN WAVE (jaisalmer)	33.1%	0.0%	0.0%	0.0%	33.1%
199	BHADLA	RENEW	24.3%	0.0%	0.0%	0.0%	24.3%
200	FTHGR2	RENEW SUN WAVE (jaisalmer)	18.9%	0.0%	0.0%	0.0%	18.9%
201	REWA	RAMNAGAR (ATHENA)	0.0%	0.0%	0.0%	0.0%	0.0%
202	JHANOR	GNDHR RE	0.0%	0.0%	0.0%	0.0%	0.0%
203	NP KUNTA	ACME KARNAL	0.0%	0.0%	0.0%	0.0%	0.0%
204	NP KUNTA	AZURE SOLAR	0.0%	0.0%	0.0%	0.0%	0.0%
205	NP KUNTA	SPRING SOLAR	0.0%	0.0%	0.0%	0.0%	0.0%
206	NP KUNTA	TATA POWER	0.0%	0.0%	0.0%	0.0%	0.0%
207	PAVAGADA	AVAADA SOLAR	0.0%	0.0%	0.0%	0.0%	0.0%
208	PAVAGADA	AVAADA SOLARISE	99.5%	0.0%	0.0%	0.0%	99.5%
209	PAVAGADA	AZURE POWER	87.3%	0.0%	0.0%	0.0%	0.0%
210	PAVAGADA	FORTUM	0.0%	0.0%	0.0%	0.0%	0.0%
211	PAVAGADA	KREDL	0.0%	0.0%	0.0%	0.0%	0.0%
212	NP KUNTA	ACME KARNAL	0.0%	0.0%	0.0%	0.0%	0.0%
213	NP KUNTA	AZURE SOLAR	0.0%	0.0%	0.0%	0.0%	0.0%
214	PAVAGADA	AZURE POWER	68.9%	0.0%	0.0%	0.0%	16.2%

WIND PARAMETERS

SNo.	Pooling Station	Station Name	AMBIENT TEMPERATURE	PRESSURE	RELATIVE HUMIDITY	WIND DIRECTION	WIND SPEED
1	PUGALUR	SPRING WIND	100.0%	98.6%	100.0%	100.0%	100.0%
2	KOPPAL	RENEW OJHAS	99.8%	0.0%	99.8%	0.0%	99.8%
3	GADAG	GIWEPL	99.1%	0.0%	99.1%	99.0%	99.1%
4	GADAG	VENA	98.8%	0.0%	98.8%	83.8%	98.8%
5	GADAG	RSRPL2	84.2%	0.0%	81.6%	98.7%	98.7%
6	TUTICORIN	JSW	0.0%	98.6%	98.6%	98.6%	98.6%
7	HIRIYUR	OSTRO KANNADA	98.4%	0.0%	98.4%	98.4%	98.4%
8	FTHGR2	ADANI HYBRID	97.3%	70.3%	97.3%	97.3%	97.3%
9	FTHGR2	ADANI HYBRID-2	97.3%	54.1%	97.3%	97.3%	97.3%
10	HIRIYUR	OSTRO KANNADA	95.9%	0.0%	95.9%	95.9%	95.9%
11	BACHAU	OSTRO	94.6%	95.9%	94.6%	94.6%	94.6%
12	BHUJ2	NAKATHRANA (AWEK4L)	94.6%	95.9%	94.6%	94.6%	94.6%
13	JAMKHAMBALIYA	POWERICA (MANJA)	90.5%	93.2%	90.5%	91.9%	94.6%
14	BHUJ2	33kV SRUJAN (MORJAR)	96.6%	0.0%	96.6%	96.6%	94.3%
15	JAMKHAMBALIYA	POWERICA (MANJA)	97.5%	97.5%	97.5%	93.5%	93.6%
16	GADAG	RSRPL2	70.3%	0.0%	68.9%	93.2%	93.2%
17	GADAG	VENA	90.5%	0.0%	91.9%	75.7%	91.9%
18	BACHAU	BHUVAD(RENEW)	96.9%	16.4%	97.6%	94.6%	90.0%
19	INDORE	PRITAM NAGAR	95.6%	0.0%	95.6%	95.6%	89.2%
20	JAMKHAMBALIYA	KHAKHARDA (AEPL)	88.3%	88.3%	1.6%	88.1%	87.9%
21	KOPPAL	RENEW OJHAS	87.8%	0.0%	87.8%	0.0%	87.8%
22	KURNOOL	AMGEPL WIND	81.1%	0.0%	86.5%	86.5%	86.5%
23	TUTICORIN	JSW	0.0%	99.7%	98.5%	98.6%	85.9%
24	BHUJ2	DEDHIYA	35.1%	0.0%	83.8%	83.8%	83.8%
25	FTHGR2	ADANI JAISALMER WIND	99.7%	0.0%	99.7%	87.5%	83.7%

Weather Parameters Sanity Report (Jan' 2026 to Mar' 2026)

26	INDORE	PRITAM NAGAR	82.4%	0.0%	82.4%	82.4%	82.4%
27	BHUJ2	33kv SRIJAN (MORJAR)	81.1%	0.0%	81.1%	81.1%	81.1%
28	BHUJ2	DEDHIYA	0.0%	0.0%	98.7%	88.3%	80.6%
29	BHUJ	VADVA (GIWEL II)	79.7%	0.0%	68.9%	79.7%	79.7%
30	GADAG	GIWEPL	74.3%	0.0%	74.3%	74.3%	74.3%
31	BACHAU	BHUVAD(RENEW)	73.0%	0.0%	9.5%	17.6%	73.0%
32	PUGALUR	SPRING WIND	99.8%	97.8%	99.8%	98.4%	70.0%
33	KOPPAL	AYANA WIND	73.4%	73.4%	73.4%	73.3%	66.3%
34	FTHGR2	ADANI JAISALMER WIND	75.7%	0.0%	75.7%	66.2%	66.2%
35	JAMKHAMBALIYA	KHAKHARDA (AEPL)	66.2%	77.0%	12.2%	66.2%	66.2%
36	TUTICORIN	BETAM WIND	66.2%	68.9%	66.2%	66.2%	66.2%
37	BHUJ	DAYAPAR	93.8%	93.5%	93.8%	6.8%	60.2%
38	BHUJ	RATADIYA	82.4%	83.8%	73.0%	74.3%	56.8%
39	BHUJ	GADSISA	52.7%	0.0%	52.7%	54.1%	54.1%
40	FTHGR2	ADANI HYBRID-3	52.7%	0.0%	52.7%	52.7%	52.7%
41	BHUJ	GADSISA	61.8%	0.0%	62.0%	62.0%	51.5%
42	BHUJ	KOTA MADH	36.5%	43.2%	36.5%	47.3%	47.3%
43	TUTICORIN	JSW2	61.4%	5.1%	61.4%	0.0%	45.2%
44	BHUJ	KOTA MADH	51.4%	51.2%	51.1%	51.6%	42.8%
45	BHUJ2	SITEC (CHUGGER)	33.2%	8.4%	12.8%	21.8%	39.9%
46	BHUJ	RATADIYA	41.7%	2.8%	32.3%	38.7%	38.8%
47	BACHAU	OSTRO	96.1%	96.1%	96.1%	96.1%	36.9%
48	BHUJ2	NAKATHRANA (AWEK4L)	96.1%	96.1%	96.1%	96.1%	36.9%
49	FTHGR1	ADANI WIND PARK WSS 3	33.2%	0.0%	16.6%	33.2%	33.2%
50	FTHGR1	ADANI WIND PARK WSS 3	32.4%	0.0%	25.7%	32.4%	31.1%
51	FTHGR1	ADANI WIND PARK WSS 4	5.4%	0.0%	5.4%	27.0%	31.1%
52	JAMKHAMBALIYA	SIDPUR	25.7%	43.2%	25.7%	25.7%	25.7%
53	FTHGR1	ADANI WIND PARK WSS 4	0.0%	0.0%	0.0%	8.2%	24.9%
54	KOPPAL	AYANA WIND	21.6%	32.4%	21.6%	21.6%	21.6%
55	BHUJ	DAYAPAR	20.3%	45.9%	20.3%	6.8%	20.3%
56	KOPPAL	ROSHINI	78.4%	0.0%	78.4%	0.0%	20.3%
57	BHUJ2	SITEC (CHUGGER)	21.6%	23.0%	14.9%	18.9%	17.6%
58	TUTICORIN	JSW2	17.6%	20.3%	17.6%	0.0%	17.6%
59	JAMKHAMBALIYA	SIDPUR	9.4%	9.4%	9.4%	9.3%	9.3%
60	KOPPAL	ROSHINI	44.6%	0.0%	45.7%	0.0%	8.2%
61	TUTICORIN	BETAM WIND	95.0%	94.7%	94.9%	95.0%	6.3%
62	BHUJ	VADVA (GIWEL II)	0.2%	0.0%	0.2%	0.2%	0.2%
72	TUTICORIN	CHANDRAGIRI	0.0%	0.0%	0.0%	4.1%	0.0%
63	BHUJ	BARANDA (AVIKIRAN)	45.1%	45.1%	45.1%	0.0%	0.0%
64	BHUJ	NARANPAR (GIWEL III)	0.0%	0.0%	0.0%	0.0%	0.0%
65	BHUJ	VALKA NANA MOTA	0.0%	0.0%	0.0%	0.0%	0.0%
66	BHUJ	BARANDA (AVIKIRAN)	75.7%	83.8%	75.7%	0.0%	0.0%
67	BHUJ	NARANPAR (GIWEL III)	0.0%	0.0%	0.0%	0.0%	0.0%
68	BHUJ	VALKA NANA MOTA	0.0%	0.0%	0.0%	0.0%	0.0%
69	TUTICORIN	CHANDRAGIRI	0.0%	0.0%	0.0%	0.0%	0.0%
70	TUTICORIN	MYTRAH	0.0%	0.0%	0.0%	0.0%	0.0%
71	TUTICORIN	ORANGE SIRONJ	0.0%	0.0%	0.0%	0.0%	0.0%
73	TUTICORIN	MYTRAH	0.0%	0.0%	0.0%	0.0%	0.0%
74	TUTICORIN	ORANGE SIRONJ	0.0%	0.0%	0.0%	0.0%	0.0%