Green Energy Project at Kutch by Powerica Limited

Document Prepared By Earthood Services Private Limited

Earthood Services Private Limited
Regd. Office: 409-410, Tower B-4, Spaze I-Tech Park, Sector 49, Sohna Road, Gurgaon- 122018, INDIA
Tel: +91 124 4204599
Fax: +91 124 4204599
Website: www.earthood.in Email: info@earthood.in

Project Title	Green Energy Project at Kutch by Powerica Limited
Version	2.0
Report ID	VCS.VER 19.34

Report Title	Green Energy Project at Kutch by Powerica Limited
Client	Powerica Limited

Pages	35
Date of Issue	24-September-2020
Prepared By	Earthood Services Private Limited
Contact	Regd. Office: 409-410, Tower B-4, Spaze I-Tech Park, Sector 49, Sohna Road, Gurgaon-122018, INDIA Tel: +91 124 4204599 Fax: +91 124 4204599 Website: www.earthood.in Email: info@earthood.in
Approved By	Dr. Kaviraj Singh Managing Director
Work Carried Out By	Team Leader: Dr. Atul Takarkhede Technical Expert (1.2): Dr. Atul Takarkhede Methodology Expert: Mr. Sanjeev Kumar Technical Reviewer: Shreya Garg Technical Expert: Shreya Garg

Summary:

The project activity consists of 12 WTGs of 1.80 MW each with total capacity comprising 21.6 MW. This is a greenfield wind power plant located in the Kutch district of Gujarat and supply electricity to the Indian grid.

The project has aimed to reduce the dependence on fossil fuel-powered power plants by substituting carbon-intensive energy with the inexhaustible and clean wind energy. As per the baseline scenario, "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by addition of new generation sources as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system". The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

Powerica Limited contracted **ESPL** to conduct the verification of the project. The scope of verification includes confirming the implementation of the monitoring plan in the registered VCS PD (Ver. 02 dated 13-January-2014) and the application of methodology ACM0002: "Grid-connected electricity generation from renewable sources", Version 12.3.0.
The verification consisted of three phases: a. Desk review of the project; b. Follow-up Remote Audit; c. Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

A total of 00 CL and 07 CARs have been raised during the verification process of the project activity which were successfully closed. No FAR have been raised during this verification.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

During the Current Monitoring Period from 01-October-2018 to 31-January-2020 (First and last date included) the project activity has supplied 59,275.89 MWh of electricity, and thus contributing to the GHG reductions 56,223 tCO_2e.

1 INTRODUCTION

1.1 Objective

"Powerica Limited" has contracted ESPL (Hereinafter referred as Earthood) to conduct the verification of the project activity "Green Energy Project at Kutch by Powerica Limited" according to the requirements of the Verified Carbon Standard version 4.0.

The objective of this verification is to verify and certify emission reductions reported for the PA "Green Energy Project at Kutch by "Powerica Limited" for the period 01-October-2018 to 31-January-2020 (including both days).

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the appropriate VCS-MR form (and other templates) was used and correctly filled up; (as per https://verra.org/wp-content/uploads/2019/09/VCS-V4-Summary-of-Effective-Dates.pdf the use of updated version of all VCS Program templates and representations is mandatory from 19 March 2020)
- the project activity is in accordance with all relevant host country criteria (India);
- the project activity is in accordance with all relevant VCS rules and requirements;
- the project activity is in accordance with conditions of the latest version of applied methodology ACM0002: Grid-connected electricity generation from renewable sources, Version 12.3.0[7].

The verification of the project activity is based on the VCS-PD and estimated GHG emission reduction calculations.

1.3 Level of Assurance

☒ Reasonable level of assurance

☐ Limited level of assurance

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considers necessary to give reasonable assurance that reported estimated GHG emission reductions are fairly stated. All documentary evidences were checked, a remote audit was conducted due to pandemic situation and technical details and metering/monitoring arrangement verified through photos/certificate shared by PP to arrive at a verification conclusion by the assessment team.

In our opinion, the estimated GHG emissions reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, Version 12.3.0 and the VCS standard, v4.0.

1.4 Summary Description of the Project

The project activity consists of 12 WTGs of 1.80 MW each with total capacity comprising 21.6 MW. This grid-connected wind power project in Gujarat generates renewable wind electricity and supplies power to the Indian power grid. The current monitoring period from 01-October-2018 to 31-January-2020 (First and last date included) the project activity supplied 59,275.89 MWh electricity to the grid. The power generated by the grid will be replacing an equivalent amount of electricity from the grid system of India which is majorly dependent on fossil-fuel based grid imports for its electricity requirements.

The project is a voluntary action being undertaken by each project owner of the project activity. EKI Energy Services Limited (hereafter referred as "EKIESL") is acting as the other party for this project activity.

Verification team confirmed the capacity by verifying commissioning certificates/10/, JMR i.e. electricity share certificates/6/ and also verified through interview with PP during the remote audit on Skype/9/ and confirmed that plant is operational. Same is evident from the JMR/6/ and invoices/5/. The WTGs involved in the project activity were commissioned in four phases–the earliest date of commissioning is 14-July-2011 and all 12 WTGs are interconnected at 220 kV Vandhiya Substation. The technical specification of all 12 WTGs (total capacity 21.6 MW) confirmed with technical specification from technology supplier and details as confirmed during remote audit provided in Sec.4.1 of this report. Technical description was found to be consistent with remote audit observation/9/ and registered VCS PD/1/.

The electricity meters are of the make SECURE. Meter installed at respective substation that are used for the export/import electricity metering are 0.2s precision and at respective WTGS at yards are of 0.5s precision. The project is based on sectoral Scope 1: Energy Industries (renewable sources) with ACM0002: Grid-connected electricity generation from renewable sources, Version 12.3.0.

During the Current Monitoring Period from 01-October-2018 to 31-January-2020 (First and last date included) the project activity has supplied 59,275.89 MWh of electricity, and thus contributing to the GHG reductions 56,223 tCO_2e.

2 VERIFICATION PROCESS

The registered VCS project is undergoing 3rd verification and the approach adopted to ensure the quality of emission reductions is described in the following sub-sections.

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using ESPL's internal procedures. The Project was verified against the latest requirements of VCS standard (Version 4.0 /14/ and guidance set out in VCS Standards as applicable.

- The validation/verification process consists of the following three phases;
- A document review of the VCS PD and VCS MR (described in Section 2.2)
- Remote Audit and follow up interviews with project stakeholders (described in Section 2.3 and 2.4)
- The resolution of outstanding issues and issuance of the final report and opinion. (described in Section 2.5)

DOE's Sampling Approach: No sampling approach was required for undertaking the current verification since all monitored data was verified by the assessment team.

2.2 Document Review

The verification is performed primarily as a review of documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (VCS PD, CDM PDD, MR, validation report) and information from sources other than those used, if available and also conducts independently background investigations.

Earthood conducted a desk review as under;

a) A review of the data and information presented to verify their completeness.

b) A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.

c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

A remote audit was conducted for the project activity on 11-June-2020. No sampling procedures were adopted either in document verification and all the documents were cross checked to ensure conservative estimation of emission reduction. A remote audit conducted due to pandemic situation and technical details and metering/monitoring arrangement verified through photos/certificates shared by PP. The names of the persons interviewed (during remote audit through Skype/telephonic interview/9/is given below;

Organization	Name of Persons/Designation	Topics discussed	Team Member
Powerica Limited	Saroj Sahoo Sr. Manager	Project Implementation, Operation & Management, Monitoring practices, Calibration requirements, data storage, QA/QC	Dr. Atul Takarkhede
Powerica Limited	Alagu Perumal S Manager	Project Implementation, Operation & Management, Monitoring practices, Calibration requirements, data storage, QA/QC	
Powerica Limited	Saravanan S Sr. General Manager	Project Implementation, Operation & Management, Monitoring practices, Calibration requirements, data storage, QA/QC	
EKI Energy	Mr. Barun Sharma (Consultant)	GHG calculations, MR and ER preparation, Data collection, data storage, QA/QC	
EKI Energy	Mr. Sauvik Mitra (Consultant)	GHG calculations, MR and ER preparation, Data collection, data storage, QA/QC	

During the remote audit, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of commissioning date of meters, the generation, recording, and monitoring of the data and the error accountability were discussed. Various documents like the JMR sheets/6/, invoices/5/etc. were also verified. Photographs/20/ clicked at site includes WTGs name plate data, meter specifications, key technical specifications of the major equipment like panel, inverter and meters and to establish the current status and the implementation of the Project Activity.

2.4 Site Inspections

Duration of on-site inspection: NA				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	NA	NA	NA	NA

The verification team could not perform on-site inspection due to the ongoing COVID-19 pandemic in the entire state of India. Ministry of Home Affairs, Government of India has order nationwide lockdown from 25-March-2020 to 14-April-2020/22/. Further extended to 03-May-2020/23/ and again extended up 17-May-2020/24/. The Kutch district of Gujarat is kept under Orange Zone of COVID-19/25/. All domestic & International travel, passenger movement by trains, interstate buses for public transport, movement by individuals are prohibited/24/. The project sites are not accessible in these locations due to lockdown. PP clarified that they do not have any person deputed at site as access to site denied. As access to project site and sub-station was restricted, video call was not possible from sub-station. Furthermore, the VCS program does not explicitly mandate onsite visit as part of the validation and verification process during such unprecedented circumstances, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per section 4.1.2 of the VCS Standard, v4.0

During interview, the implementation of project activity and monitoring procedure and systems in place was confirmed. Technical specification of the plant verified through the photographs/name plates of WTGs/20/ shared by PP and the same was cross checked with the previous verification report. Further, assessment team has also checked through interviewing PP and confirmed that the monitoring plan as described in the VCD PD is actually practiced onsite.

After skype video call with PP representatives and verifying the photographs of WTGs and calibration certificates of meters , verification team confirmed that monitoring procedure is followed as per registered VCS PD/1/ and there is no change in technical specifications of plants since installation and all the meters are calibrated in accordance with VCS PD/1/ and host country metering guidelines i.e. once in 5 year/19/. .

A remote audit was conducted by the assessment team (Dr. Atul Takarkhede) on 11-June-2020 to carry out the following;

a. An assessment of the implementation and operation of the registered project activity as per the registered PD or any approved revised PD/1/ and MR/2/;

b. A review of information flow for generating, aggregating and reporting the monitoring parameters;

c. Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD;

d. A cross-check between information provided in the monitoring report and data from other sources such as JMR sheets, invoice slips, PPA agreement etc.;

e. A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD[1], the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;

f. A review of calculations and assumptions made in determining the GHG data and emission reductions;

g. An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

The findings may be of the following types: CAR- Corrective Action Request, CL- Clarification Request and FAR- Forward Action Request.

The list of findings and their resolution are presented in Appendix 2 of this verification report. The section also includes the response, if provided, by the project participants and an assessment by the assessment team if it was closed or otherwise. It is to be noted that all the findings have been satisfactorily resolved by the assessment team.

A total of 07 CAR and 00 CL were raised in the current verification. All the findings that are raised and communicated to project participant during the verification are included under Appendix 2. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

This is 3rd periodic verification of the project activity and no FAR is raised during current verification and no FAR from previous verification as well.

2.6 Eligibility for Validation Activities

As project is already validated and this is 3rd verification of the project. Hence, this section not applicable.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project is registered as CDM project activity (UN7671); however PP is not claiming emission reduction in CDM for the monitoring period under this report. Assessment team checked the CDM registered project section and no monitoring report of this period is submitted for verification, Also, PP has provided a declaration of not claiming emission reduction benefits under any CDM scheme/16/.

3.2 Methodology Deviations

No methodology deviation is envisaged for present verification.

3.3 Project Description Deviations

There is an approved deviation for the project activity.

A deviation for change in calibration frequency has been requested. As per registered CDM PDD, the calibration frequency is once in every year. However, it has been observed that the calibration of meters is not in control of PP and same is done by the state electricity board. The state electricity board does not follow any fixed calibration frequency; hence deviation is requested for change in calibration frequency as once in five years. The new requested calibration frequency of 5 years is as per CEA/19/ is considered to be in line with the requirement. Moreover, this deviation was also accepted in 2nd periodic verification.

The change in calibration frequency does not have any impact on ER calculations as during monthly reading state electricity board official and PP representative check the meter conditions. Also, both parties accept the reading and PP raise the invoice to State Electricity Board based on monthly JMR/Certificate of electricity share reading/6/. Thus, financial obligations are involved which ensures that meters are running accurately/5/.

3.4 Grouped Project

This is not a grouped project. Thus, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the remote audit (skype video call) with PP, it was concluded that the project is implemented as per the instruction of the registered VCS PD/1/ and this is verified from the commissioning certificates/10/. Breakdown log sheet[26] sheet of WTGs are submitted by PP. There was no unforeseen situation evolved which can impact the operation of the project activity. Scheduled maintenance was carried out as per the instruction of the manufacturer /18/and the same is acceptable to the assessment team.

The total installed capacity of the project is 21.6 MW/10/; which involves 12 Wind Turbine Generators (WTGs), each of 1.80 MW capacity in Kutch district of Gujarat by Powerica Limited. The technical specification of the plant verified through the photographs/name plants/9/ of the WTGs provided by the PP and the same is also with the technical details provided by the manufacturer/18/.

The assessment team conducted a remote audit through skype video call with the PP in order to verify the status of the project implementation of the monitoring plan. It has also been verified as per the guidelines in ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0 that the calculations for the GHG emission reductions are done in accordance with the aforesaid methodology/7/. The assessment team also confirmed that the monitoring system for emission reduction calculation was in place and in accordance with the registered VCS PD/1/. There is one deviation request by PP.

A deviation for change in calibration frequency has been requested. As per registered CDM PDD, the calibration frequency is once in every year., however it has been observed that the calibration of meters is not in control of PP and same is done by the state electricity board. The state electricity board does not follow any fixed calibration frequency; hence deviation is requested for change in calibration frequency as once in five years. The new requested calibration frequency of 5 years is as per CEA notification/19/ is considered to be in line with the requirement. Moreover, this deviation was also accepted in 2nd periodic verification.

It can be confirmed by the assessment team that the change in calibration frequency does not have any impact on ER calculations as during monthly reading state electricity board official and PP representative check the meter conditions. Also, both parties accept the reading and PP raise the invoice to state electricity board based on monthly JMR reading. Thus, financial obligations are involved which ensures that meters are running accurately. Hence in opinion of assessment team this deviation can be approved.

The assessment team observed that the project is in line with the registered PD, FVR and approved methodology other than requested deviation. During the current monitoring duration, no events have been found that can change the design of project. Further, this deviation requested has also been accepted in previous verification/21/.

The details of the WTGs for the project including commissioning dates and their location of installation are mentioned in the table below:

WTG ID	WTG No.	Commissioning Date	Latitude	Longitude	Village
NM82-4	VWT/1800/11-12/2135	14-July-2011	23°12'5''	70° 35' 19''	Vandhiya
JW 27	VWT/1800/11-12/2136	16-July-2011	23°12' 49''	70° 33' 35''	Jangi
VW 32	VWT/1800/11-12/2134	16-July-2011	23°12'12''	70° 37' 12''	Vandhiya
VW 21	VWT/1800/11-12/2133	19-July-2011	23°12'20''	70° 37'30''	Vandhiya
NM82-3	VWT/1800/11-12/2309	29-December-2011	23°11'53''	70° 35'26''	Vandhiya
JW 30	VWT/1800/11-12/2316	31-December-2011	23°11' 59''	70° 31'55''	Jangi
NM82-7	VWT/1800/11-12/2311	29-December-2011	23°11'53''	70° 35' 58''	Vandhiya
JW 09	VWT/1800/11-12/2312	31-December-2011	23°12'3''	70° 33'2''	Jangi
JW 10	VWT/1800/11-12/2313	31-December-2011	23°11'56''	70° 32'48'	Jangi
JW 12	VWT/1800/11-12/2314	31-December-2011	23°12' 29''	70°32' 13''	Jangi
JW 13	VWT/1800/11-12/2315	31-December-2011	23°12'12''	70°32' 16''	Jangi
NM 82-06	VWT/1800/11-12/2310	29-December-2011	23°11'59''	70° 35' 47''	Vandhiya

The project activity WTGs are connected to substation through Vandhya Line 1 and Vandhya Line 2 feeder lines. The energy meters are installed at each WTG site and also at substation feeder line.

Capacity of the projects and date of commissioning verified with commissioning certificates/10/ and technical specifications provided by technology supplier/18/.

Geo coordinates checked on Google earth/17/ & also crosschecked with previous verification report and thus, verification team conclude geo coordinates of project locations are consistent with registered VCS PD/1/.

Assessment team checked the technical details of the project activity from the manufactures specification and the detail are as follow:

Wind Project Technology Details

The project activity aims to harness wind energy through installation of wind power project with total installed capacity of 21.6 MW. The project activity is commissioned in five phases and earliest date of grid interconnection is 14-July-2011. The technical specification of WTGs are as follows:

Parameters	Value
Make	Vestas
Model	V-100
Rated Power	1800 KW
Rotor diameter	100 m
Swept area	7850 m2
Cut in wind speed	4 m/s
Cut out wind speed	20 m/s
No. of Blades	3
Rotor Speed	14.4 rpm
Hub Height	80 m
Generator Type	Asynchronous with wound rotor, slip rings

Assessment team concludes the following:

a) The implementation status of project activity was found to be in compliance with registered PD/1/.

b) DOE has conducted the remote audit of site to confirm the implementation status of the project/9/.

c) The commissioning date of the project activity was found to be accurately and consistently recorded/10/.

d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD/1/.

e) The emission reductions achieved during the current monitoring period are 56,223 tCO_2e.

The project activity contributes to the sustainable development by utilising wind energy for generating electricity which otherwise would have been generated through fossil fuels. Thereby reduction in usage of non-renewable sources used to generate energy.

Further the GHG emission reductions generated by the project activity has not been included by any other emissions trading program or any other mechanism that includes GHG allowance trading. Also, the project has not received any other form of environmental credit and has not been participated/rejected under any other GHG programs.

Sustainable Development- The project will contribute to the sustainable development in the following ways

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy and it results better air quality.
2. Social: Setting up of the project activity has created new job openings hence is supporting employment of the local people around.
3. Economical: It results in rural & infrastructural development in the surrounding rural area.
4. Technological: The project activity implemented the technology, which is environmentally safe and sound.

Further the project has been implemented as described in the Project Description/1/. CAR 01, CAR 02, CAR 03 and CAR 04 were raised on the editorial issue of description and same were resolved by revision in the MR/2/.

The total emission reductions achieved in this monitoring period i.e. from 01-October-2018 to 31-January-2020 (inclusive both days) are 56,223 tCO_2e.

4.2 Safeguards

4.2.1 No Net Harm

As PP does not see and identify any potential negative environmental and socio-economic impacts, hence this section is not required.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. For on-going stakeholders communication, PP have maintained feedback/complaint register at the site office/9/. Assessment team checked the grievance registers available at sites and found that local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project. During interviews with PP, it was confirmed that Site Manager/In-charge is responsible to address any grievances received from stakeholders/9/. During current monitoring period no grievance was received/27/. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate.

4.3 AFOLU-Specific Safeguards

This is non AFOLU projects, hence this section not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the MR.
Findings	CAR 06 was raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	**Ex-ante Parameter:** **$EF_{grid,OM,y}$ =** Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9941 tCO_2/MWh. Verification team found same was used in the ER calculations. **$EF_{grid,BM,y}$ =** Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.8123 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of **$EF_{grid,OM,y}$** and **E $F_{grid,BM,y}$** emission factor are taken from CEA database, Ver. 06, March 2011. Verification team checked the EF values and found in consistent with registered PD. **$EF_{grid,CM,y}$** = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9486 tCO_2/MWh. The same was calculated as $EF_{Grid,CM,y} = w_{OM} * EF_{Grid,OM,y} + w_{BM} * EF_{Grid,BM,y}$ = 0.75 * 0.9941 + 0.25 * 0.8123 = 0.9486 tCO_2/MWh. Verification team checked the EF value and found in consistent with registered PD. **Baseline Emissions:** The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used: - $$BE_y = EG_{facility,,y} \times EF_{grid,CM,y}$$ Where: BE_y = Baseline emissions in year *y* (t CO_2/yr) $EG_{Facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year(MWh) $EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh) **Monitored Parameter:** The monitored parameter i.e. $EG_{facility,y}$ = 59,275.89 MWh. The year wise net

	electricity supplied to grid is provided below: **Year** | **Net Electricity Supplied to Grid(MWh)** 2018 | 4989.44 2019 | 51324.12 2020 | 2962.34 **Total** | **59475.89** The verification team has checked the entire monthly certificate of electricity share/JMR reports/06/ for net electricity generated & supplied to the grid and crosschecked same with the invoices/05/ raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the MR. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the JMR sheet and invoice and found all the values are matching. PE_y = As per ACM0002 -Version 12.3.0, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind power generation, project, project emissions (PE_y) are taken as zero. Leakage: As per ACM0002 - Version 12.3.0, Leakage emissions are not considered for the project activity.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log sheet for the monitoring period. The feeder wise location of the wind power plant was also confirmed during the interview with PP and same was verified with the MR and previous verification report. The metering arrangement is tri-vector bi-directional energy meters (main and check) at the State Electricity Board (SEB) substation. These meters record parameters including electricity exported & imported. These meters are being used by state electricity board for certificates of electricity share/JMR electricity statements. The joint monthly meter reading is taken at Vandhiya substation meters (both main and check) by representative of state electricity board and O & M service provider. The net electricity export from each WTG in the wind farm is recorded by an energy meter installed in the substation and individual meter at WTG. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2s for project activity applied for verification. As per registered CDM PDD, meter to be calibrated every year. However, the calibration is done once in a 5 year/19/. PP has requested deviation to calibrate the meter once in five year. Calibration of meter is not in control of PP and the same is to be done by the state electricity board. This calibration frequency is as per Central Electricity Authority (CEA) regulation notification/19/. The details of Calibration of the meters as confirmed during remote audit and calibration certificates are mentioned in Appendix 5 of this report. The assessment team checked the same and found correct. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly,

	O&M contractor is responsible for monitoring of the generation data at CMS. PP representatives confirmed that the CMS data as well as JMR sheets and invoices will be kept for 2 years following the end of the crediting period. During discussion with PP, assessment team confirm that the data will be kept for 2 years following the end of the crediting period. The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the interviewing O&M personnel and checking of records/ log books maintained at site.
Findings	CAR 07 raised during the verification process which was closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	The assessment team confirms that the value of net electricity exported to the grid as used in emission reduction calculation is correct. The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity. During interview with O&M personnel on skype it is also confirming that the operational and organizational chart as mentioned in MR is as per the site practice and thus assessment team confirms that the details are correct. The break down log is checked and found that the WTGs undergone scheduled maintenance as per the guideline provided by the manufacturer which is acceptable to the assessment team. No unforeseen incident observed during the monitoring period which could alter the applicability of the methodology or change in project specification as mentioned in the registered VCS PD/CDM PDD. The project undergone Continuous operation from the inception/commissioning and the same is confirmed from the JMR reports and invoices raised for the said period of verification. Comparison of actual and estimate emission reductions achieved: Assessment team checked the calculation of estimated VER vs. Actual VER. As per the registered VCS PD the amount of VERs annually is 53,122 tCO2e. The days involved in present monitoring period are 488. Therefore, on pro-rata basis, the estimated VERs for the monitoring period is 71,023 tCO2e. Actual VERs obtained for the monitoring period is 56,223 tCO2e and thus the actual VER is 20.8% lower than the estimated VER. This variation is majorly due to the variations in availability of sunny days, climatic conditions, grid availability and other parameters which are not in the control of PP.

4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 VERIFICATION CONCLUSION

Earthood Services Private Limited (Earthood), contracted by Powerica Limited, has performed the independent verification of the emission reductions for the VCS project activity reference number 1210 "Green Energy Project at Kutch by Powerica Limited" in India for the monitoring period 01-October-2018 to 31-January-2020 (inclusive both days) reported in the Monitoring Report Version 03, dated 19-September-2020.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology "ACM0002 - Version 12.3.0", the monitoring plan contained in the CDM PDD version 06 and VCS guidelines version 4.0, Monitoring Report Version 03 dated, 19-September-2020 as per the process described under Section 2 of this report.

Earthood's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-October-2018 to 31-January-2020 are fairly stated in the Monitoring Report Version 03, dated 19-September-2020. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology "ACM0002 - Version 12.3.0" and the VCS standard. Verification period: 01-October-2018 to 31-January-2020 (inclusive of both days).

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-October-2018 to 31-December-2018	4,732	0	0	4,732

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-January-2019 to 31-December-2019	48,681	0	0	48,681
01-January-2020 to 31-January-2020	2,810	0	0	2,810
Total	**56,223**	**0**	**0**	**56,223**

Approved by

Dr. Kaviraj Singh

Managing Director **Date: 25/09/2020**

Earthood Services Privated Limited **Place: Gurgaon, Haryana**

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

S.No	Title of Document	Version	Date
1.	Registered VCS PD	02	13-January-2014
2.	VCS Monitoring Report	03	19-September-2020
3.	ER spreadsheet (corresponding to the final monitoring report)	02	19-September-2020
4	Calibration Certificates of all meters used in the current	-	-
5.	Invoice issued by PP for the duration of monitoring period (01-October-2018 to 31-January-2020) Break up: 01-Otober-2018 to 31-Dec-2018 1-Jan-2019 to 22-Dec-2019 1-January 2020-31-January-2020	-	-
6.	Certificate for share of electricity (Joint Meter Readings) for the duration of monitoring period (01-October-2018 to 31-January-2020) Break up: 01-October-2018 to 31-December-2018 01-January-2019 to 31-December-2019 01-January-2020 to 31-January- 2020	-	-
7.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002,	Version 12.3.0	-
8.	CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt.	version 6	March 2011
9.	Remote audit records	-	11-June-2020
10.	Commissioning Certificate of WTGs	-	-
11.	Power Purchase Agreement 7.2 MW (4x1800 kW) 14.4 MW (8 x1800 kW)	-	 24-June-2011 12-September-2011
12.	VCS webpage for the project, VCS ID 1210; https://registry.verra.org/app/projectDetail/VCS/1210	-	Last accessed on 01-May-2020
13.	O&M contract for all project sites	-	-
14.	VCS Standard	Version 4.0	Last accessed on 01 May-2020
15.	VCS Program Guide	Version 4.0	Last accessed on 01- May 2020
16	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for	-	23-March-2020

S.No	Title of Document	Version	Date
	the same period and double counting		
17	Google Earth desktop/Mobile application	-	Last accessed on 01-May-2020
18	Technical specifications by technology supplier	-	-
19	Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 https://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf (page 12)		17-March-2006
20	Photograph of site/Name plates		
21	Verification report of the second monitoring period.	Version 02	24-January-2019
22	Ministry of Home Affairs Order https://www.mha.gov.in/sites/default/files/MHAorder%20copy.pdf	-	24-March-2020
23	Ministry of Home Affairs Order (D.O No.40-3/2020-DM-I(A) https://www.mha.gov.in/sites/default/files/MHA%20DO%20letter%20dt.14.4.2020%20to%20Chief%20Secretaries%20and%20Administrators%20for%20strict%20implementation%20of%20Lockdown%20Order%20during%20extended%20period.pdf	-	14-April-2020
24	Ministry of Home Affairs Order (Order No.40-3/2020-DM-I(A) https://www.mha.gov.in/sites/default/files/MHA%20Order%20Dt.%201.5.2020%20to%20extend%20Lockdown%20period%20for%202%20weeks%20w.e.f.%204.5.2020%20with%20new%20guidelines.pdf	-	01-May-2020
25	Department of Health and Family welfare, Ministry of Health and Family Welfare, Govt of India Order (D,O.No.Z.28015/19/2020-EMR) https://www.thehindu.com/news/resources/article31478595.ece/BINARY/Ltr%20to%20CS%2030%20april.pdf.pdf		30-April-2020
26	Break Down Summary of Plant	-	-
27	Grievance registered maintained at site	-	-

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	XX	Section no.		Date : DD/MM/YYYY
Description of FAR				
There is no FAR from the validation/previous verifications of the project activity				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	XX	Section no.	-	Date: DD/MM/YYYY
Description of CL				
-				
Project participant response				Date: DD/MM/YYYY
-				
Documentation provided by project participant				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Table 3. CAR from this verification

CAR ID	01	**Section no.**	4.1	**Date :** 11-June-2020
Description of CAR				
PP is requested to provide the following supporting documents to assessment team for verification: 1. Commissioning Certificates of WTGs 2. The technical specifications of WTGs 3. Power purchase agreement 4. Break Down details/Plant log book				
Project participant response				**Date :** 24-June2020

1. Commissioning certificates of WTGs have been provided 2. Technical specification of WTGs has been provided 3. Power Purchase Agreement has been provided 4. Breakdown details have been provided
Documentation provided by project participant
1. Commissioning Certificates of WTGs 2. Technical specification of WTGs 3. PPA *4. Break Down details/Plant log book*
DOE assessment **Date:** 25-June-2020
1. Assessment team has reviewed the Commissioning Certificates of WTGs provided by the PP and found that commissioning dates of WTGs are correct. The commissioning dates of WTGs are now provided in Section 3.1 of revised MR. 2. Assessment team has checked the technical Specification/Product brochure provided by the PP and confirms that the technical specifications of WTGs are same as mentioned in VCD PD. 3. PP has submitted the copies of Power Purchase agreement (PPA). Assessment team has checked the PPA and confirms that PPA for 4 WTGs (7.2 MW) and 8 WTGs (14.4 MW) were signed on 24/06/2011 and 12/09/2010 with Gujarat Urja Vikas Nigam Limited. 4. Breakdown details has been updated in MR and log books as evidence has been submitted. The same is verified by the assessment team. **CAR Closed.**

CAR ID	02	**Section no.**	4.1	**Date :** 11-June-2020
Description of CAR				
There is alteration in section numbers after Section 3.1. Correction sought.				
Project participant response				**Date :** 24-June-2020
The section numbering after Section 3.1 in MR has been corrected				
Documentation provided by project participant				
Monitoring Report Version 02				
DOE assessment				**Date:** 25-June-2020
PP has corrected the alternation of MR template. **Hence, CAR closed.**				

CAR ID	03	**Section no.**	4.1	**Date :** 11-June-2020
Description of CAR				
Break down details of WTGs are missing in Section 3.1 of the MR. Correction sought.				
Project participant response				**Date :** 24-June-2020
Breakdown details of WTGs have mentioned in Section 3.1 and referred to APPENDIX-2 of the MR				
Documentation provided by project participant				

Monitoring Report Version 03	
DOE assessment	**Date:** 25-June-2020
PP has not given the response of this CAR. CAR remains open.	
Project participant response	**Date :** 17-July-2020
Breakdown details of WTGs have mentioned in Section 3.1 and referred to APPENDIX2 of the MR	
Documentation provided by project participant	
Monitoring Report Version 03	
DOE assessment	**Date:** 18-July-2020
PP has provided the breakdown log sheet and also mentioned in APPENDIX-2 revised MR. Assessment team has reviewed the same and confirms that Power plant underwent normal operation and shut-down for schedule maintenance during the current monitoring period. **Hence CAR is closed.**	

CAR ID	04	**Section no.**	4.1	**Date:** 11-June-2020
Description of CAR				
PP requested to submit declaration in effect of avoiding double counting with regard to Participation under other GHG Programs/Other forms credits.				
Project participant response				**Date:** 24-June-2020
PP has provided declaration that it will not claim GHG /environmental credits in any other GHG program /Other forms of credits during this monitoring period				
Documentation provided by project participant				
Declaration from PP that in this monitoring period, it will not claim GHG /environmental credits in any other GHG program /Other form of credits during this monitoring period				
DOE assessment				**Date:** 25-June-2020
PP has submitted the declaration in effect of avoiding double counting with regard to Participation under other GHG Programs/Other forms credits dated 23/03/2020. **Hence, CAR closed.**				

CAR ID	05	**Section no.**	4.2.2	**Date :** 11-June-2020
Description of CAR				
Section 2.2 of MR is not clear about any comments received during monitoring period and mechanism for ongoing stakeholder's consultation. PP also requested to submit copies of grievance registers for the monitoring period.				
Project participant response				**Date :** 24-June-2020
Section 2.2. of the Monitoring Report has been revised with stakeholder comments during this monitoring period and the mechanism for ongoing stakeholders' consultation.				
Documentation provided by project participant				
Monitoring Report Version 02				

DOE assessment	Date: 25-June-2020
Section 2.2 of MR still not updated to include the stakeholder comments received during monitoring period and mechanism for ongoing stakeholder consultation. CAR remains Open.	
Project participant response	**Date :** 17-July-2020
Section 2.2. of the MR has been updated with inclusion of local stakeholders' consultation in the current monitoring period	
Documentation provided by project participant	
Monitoring Report Version 03	
DOE assessment	**Date:** 18-July-2020
PP has included the ongoing mechanism of stakeholder consultation process in Section 2.2 of revised MR. Assessment team through interview with the PP confirms no major comments/grievances/suggestions have been received during the current monitoring period. **CAR Closed.**	

CAR ID	06	Section no.	4.4	Date : 11-June-2020
Description of CAR				
Net electricity export data of 7.2 MW is not correct in ER sheet for the month of Dec-19. Also, monitoring period in ER sheet is not consistent with the MR. Correction sought. Further, PP is requested to submit the copy of electricity invoice for cross checking.				
Project participant response				**Date :** 24-June-2020
ER calculation sheet has been revised with corrected value of net electricity export data of 7.2 MW for the month of Dec-19. The monitoring period mentioned in ER sheet and MR has been revised. Electricity sales invoices have been provided for cross-checking.				
Documentation provided by project participant				
1. Ex-post ER sheet version 02 2. Monitoring Report Version 02 3. Electricity Sales Invoices				
DOE assessment				**Date:** 25-June-2020
PP has corrected the net electricity export data of 7.2 MW of the month Dec 2019. PP has also revised the ER calculation sheet and updated the total net electricity export to grid in revised MR. Assessment team has cross checked the value of net electricity export with invoice and found correct. **Hence, CAR closed.**				

CAR ID	07	Section no.	4.5	Date : 11-June-2020
Description of CAR				
PP requested to submit copies of the calibration certificates of electricity meters to verification team. Further, In Section 4.2 of MR, PP has referred section 2.2.2 for request of deviation. Correction sought.				

Project participant response	Date : 24-June-2020
Calibration certificates of electricity meters have been provided. Monitoring Report section 4.2 has been revised with correct reference (reference given for section 3.2.2 for deviation instead of 2.2.2)	
Documentation provided by project participant	
1. Calibration certificates of electricity meters 2. Monitoring Report Version 02	
DOE assessment	**Date:** 25-June-2020
Now PP has submitted the calibration certificates of all meters. As per registered VCS PD, the calibration frequency was once in a year. However, deviation for change in calibration frequency has been approved during previous 2nd verification to once in five year as per CEA notification http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf ,page 12. Based on the submission of reason and fact verified during discussion with PP and with the consideration that deviation requested does not have any impact on the emission reduction calculation and additionality of the project, it can be accepted and recommended. Further, PP has corrected the reference of deviation in section 4.2 of revised MR. **Hence CAR is closed.**	

Table 4. FAR from this verification

FAR ID	XX	Section No.		Date : DD/MM/YYYY
Description of FAR				
There is no FAR from this verification				
Project participant response				**Date :** DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				**Date:** DD/MM/YYYY
NA				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement			
Name	Atul Takarkhede		
Education	Ph.D. Environmental Science		
Experience	12 years		
Field	Climate Change and environment		
Approved Roles			
Team Leader	YES		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2)		
Reviewed by	Shreya Garg	**Date**	24/04/2019
Approved by	Anshika Gupta	**Date**	25/04/2019

Competence Statement			
Name	Sanjeev Kumar		
Country	India		
Education	B. Tech. (Chemical Engineering) M.Tech. (Energy Management)		
Experience	13.5 years +		
Field	Climate Change, Environment, Energy		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (ACM0002, ACM0006, ACM0004, ACM0009, ACM0012, ACM0001, AMS I.D, AMS I.F, AMS I.C, AMS I.A, AMS II.D, AMS II.E, AMS III.H, AM0009, AM0013, AM0025, AM0056, AM0028, AM0029, AM0008)		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, 4.1, 13.1)		
Reviewed by	Shreya Garg	**Date**	13/12/2018
Approved by	Anshika Gupta	**Date**	13/12/2018

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	7 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent

DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
GEDA	Gujarat Energy Development Agency
RBI	Reserve Bank of India
PP	Project Participant

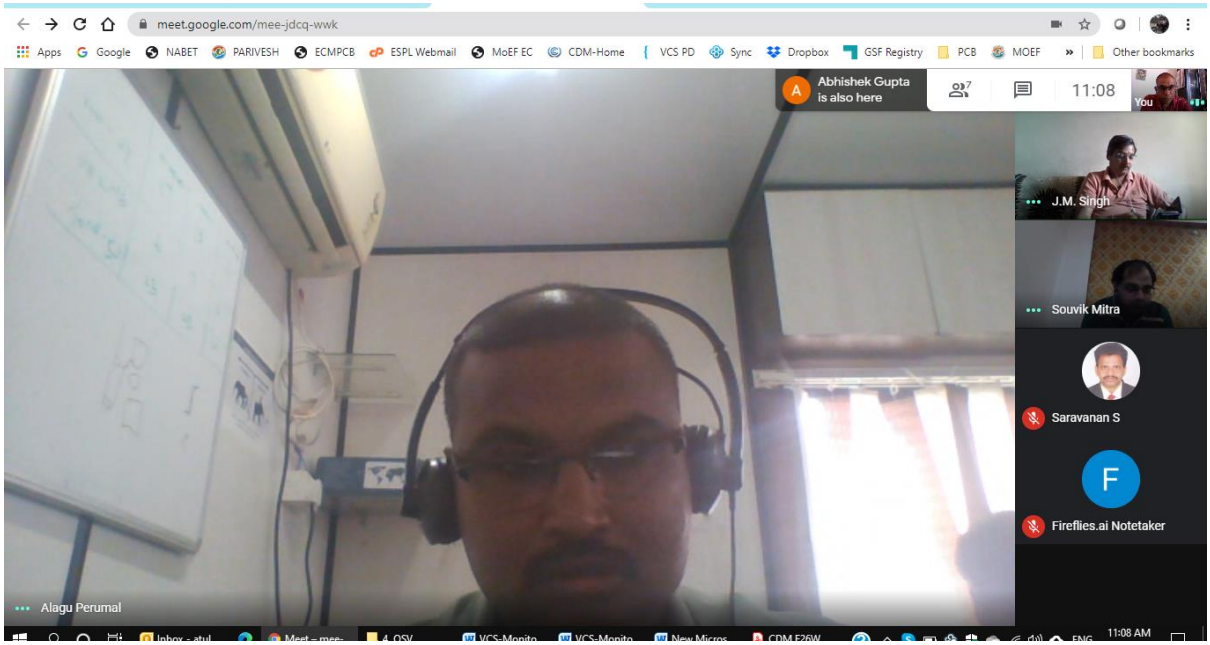
APPENDIX 5: METER CALIBRATION DETAILS

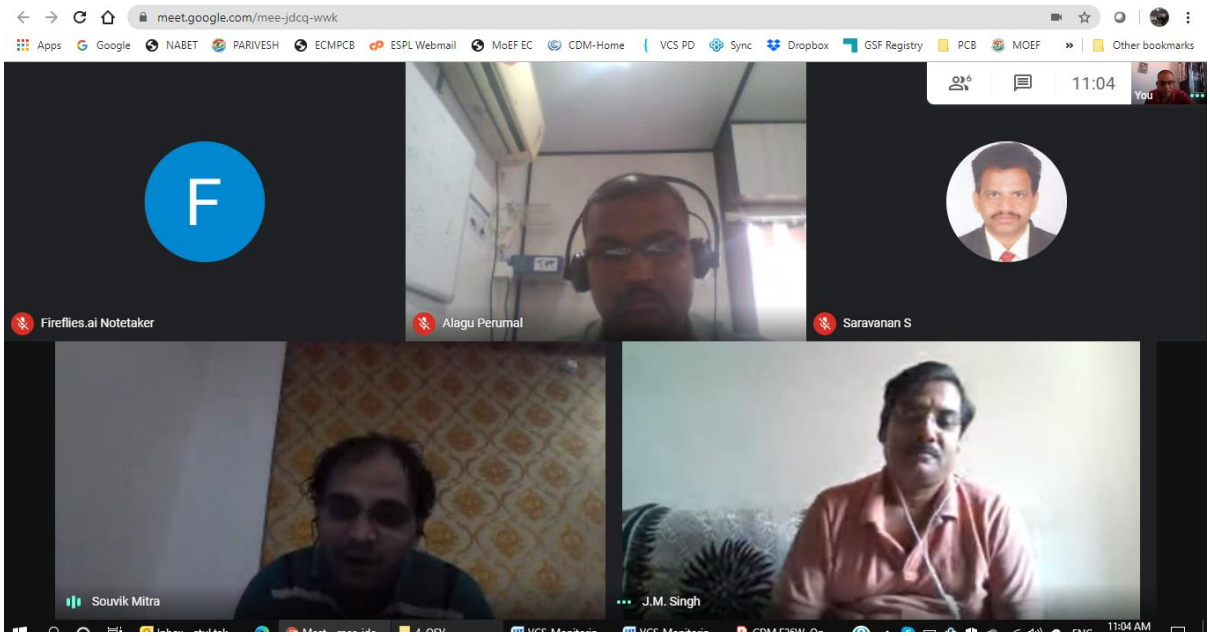
WTG No	Meter Serial No.	Calibration Date	Validity	Calibration compliance
NM82-4	GJU64200	07/03/2018	06/03/2023	Yes
JW27	GJU61847	09/03/2018	08/03/2023	Yes
VW32	GJU61845	14/03/2018	12/03/2023	Yes
VW21	GJU61844	14/03/2018	13/03/2023	Yes
NM82-3	GJU65938	07/03/2018	06/03/2023	Yes
JW30	GJU64165	09/03/2018	08/03/2023	Yes
INM82-7	GJU74498	07/03/2018	06/03/2023	Yes

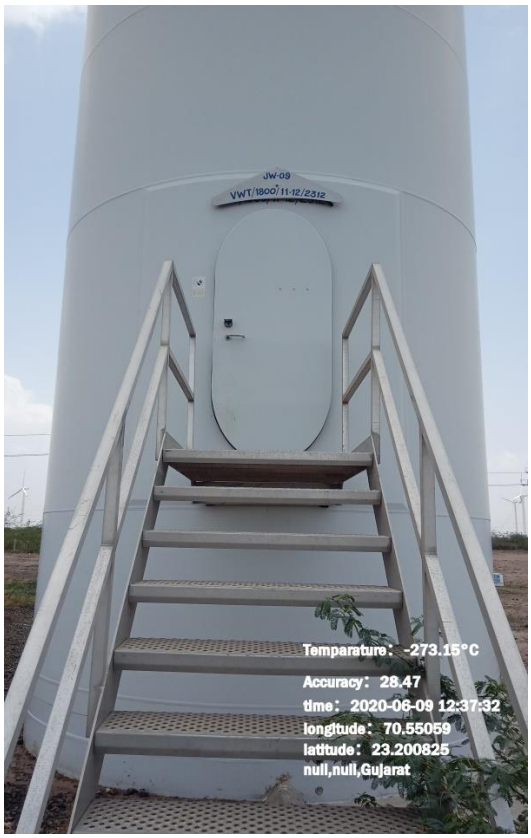
NM82-6	GJU74496	07/03/2018	06/03/2023	Yes
JW09	GJU64145	09/03/2018	08/03/2023	Yes
JW10	GJU64174	09/03/2018	08/03/2023	Yes
JW12	GJU64152	09/03/2018	08/03/2023	Yes
JW13	GJU64146	09/03/2018	08/03/2023	Yes

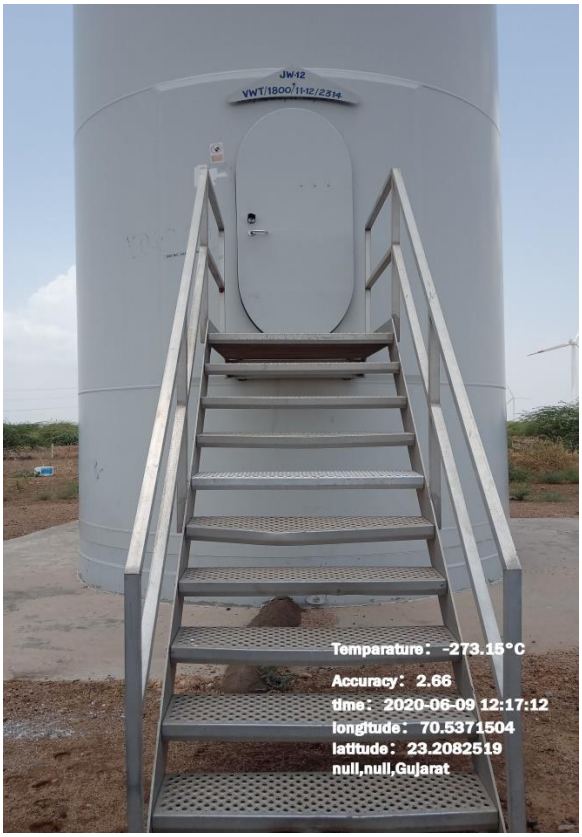
All meters are of Secure Make and 0.2s accuracy class. The calibration is under control of state electricity board and PP do not have any control on it. Considering five years calibration frequency as per CEA notification and as per deviation request, there is no any delay in calibration applicable for the project activity.

APPENDIX 6: REMOTE AUDIT, WTG & METER PHOTOGRAPHS






JW-09
VWT/1800/11-12/2312
Temparature: -273.15°C
Accuracy: 28.47
time: 2020-06-09 12:37:32
longitude: 70.55059
latitude: 23.200825
null,null,Gujarat


JW-12
VWT/1800/11-12/2314
Temparature: -273.15°C
Accuracy: 2.66
time: 2020-06-09 12:17:12
longitude: 70.5371504
latitude: 23.2082519
null,null,Gujarat


JW-13
VWT/1800/11-12/2315
Temparature: -273.15°C
Accuracy: 4.24
time: 2020-06-09 12:10:41
longitude: 70.5381397
latitude: 23.2034281
null,null,Gujarat


NM-03
VWT/1800/11-12/2309
Temparature: -273.15°C
Accuracy: 2.742
time: 2020-06-09 13:09:59
longitude: 70.5905777
latitude: 23.1982143
null,Lakhapar,Gujarat


Premier
SECURE
Sr. No.: GJU64146
Type: E3M051, 3Ph, 4Wire
(kWh, kVArh, kVAh, kW, KVA)
SECURE METERS LTD.
Unit II, Village Bated, Barotiwala,
H.P., India
Power Factor: 1 To -1
Ref. Temp 27°C
400 Pulses/Unit
Ib: 1A
Imax: 2A
IEC 62053-22
Cl: 0.5s
Year: 2011
2020-7-13 17:44


Premier
SECURE
Sr. No.: GJU61847
Type: E3M051, 3Ph, 4Wire
(kWh, kVArh, kVAh, kW, KVA)
SECURE METERS LTD.
Power Factor: 1 To -1
Ref. Temp 27°C
400 Pulses/Unit
Ib: 1A
Imax: 2A
IEC 62053-22
Cl: 0.5s
Year: 2011
2020-7-13 18:54