Gold Standard
for the Global Goals

TEMPLATE

# MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT – **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

# KEY PROJECT INFORMATION

## Key Project Information

| | |
|---|---|
| **GS ID (s) of Project (s)** | GS7589[1] |
| **Title of the project (s) covered by monitoring report** | 9.6 MW Wind Energy Project at Jamvadi & Navagam & Kalavad, Jamnagar, Gujarat, India of Rohit Surfactants Pvt. Ltd |
| **Version number of the PDD/VPA-DD (s) applicable to this monitoring report** | 03 |
| **Version number of the monitoring report** | 04 |
| **Completion date of the monitoring report** | 28/09/2022 |
| **Date of project design certification** | 27/06/2022 |
| **Date of Last Annual Report** | N.A. |
| **Monitoring period number** | 01 |
| **Duration of this monitoring period** | 21/10/2018[2] to 31/12/2020 (inclusive of both dates) |
| **Project Representative** | Rohit Surfactants Pvt. Ltd |
| **Host Country** | India |
| **Activity Requirements applied** | ☐ Community Services Activities<br>☒ Renewable Energy Activities<br>☐ Land Use and Forestry Activities/Risks & Capacities<br>☐ N/A |
| **Methodology (ies) applied and version number** | AMS I.D. Version 18.0[3] "Grid Connected Renewable Electricity Generation" |
| **Product Requirements applied** | ☒ GHG Emissions Reduction & Sequestration<br>☐ Renewable Energy Label<br>☐ N/A |

[1] https://registry.goldstandard.org/projects/details/2204
[2] According to to the VVB site visit requirement, the monitoring period start date cannot be earlier to 3 years from the VVB onsite visit which was conducted on 21/10/2021.
[3] https://cdm.unfccc.int/filestorage/2/P/7/2P7FS6ZQAR84LG3NMKYUH50WI9ODBC/EB81_repan24_AMS-I.D_ver18.pdf?t=azl8cXNiNGlofDBwqYvufFNY0FL0bqfx9ol7

**Table 1 - Sustainable Development Contributions Achieved**

| Sustainable Development Goals Targeted | SDG Impact | Amount Achieved | Units/ Products |
|---|---|---|---|
| SDG 13- Take urgent action to combat climate change and its impacts | Emission reductions | 27,955 | $tCO_2e$ GSCER's |
| SDG 7– Ensure access to affordable, reliable, sustainable and modern energy for all | MWh of renewable energy generated | 30,303.88 | MWh |
| SDG 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and descent work for all | Number of trainings and employment through project | 16 people employed, 5 trainings given | Number |

**Table 2 – Product Vintages**

| | | Amount Achieved | | |
|---|---|---|---|---|
| **Start Dates** | **End Dates** | **SDG 7** | **SDG 8** | **SDG 13** |
| 21/10/2018 | 31/12/2018 | 2,498.87 MWh | 16 people employed<br>1 Training conducted | 2,305 $tCO_2e$ |
| 01/01/2019 | 31/12/2019 | 15,751.60 MWh | 16 people employed<br>2 Trainings conducted | 14,531 $tCO_2e$ |
| 01/01/2020 | 31/12/2020 | 12,053.41 MWh | 16 people employed<br>2 Trainings conducted | 11,119 $tCO_2e$ |

# SECTION A. DESCRIPTION OF PROJECT

## A.1. General description of project

The project activity involves the installation of 12 Wind Turbine Generators (WTGs) with a total capacity of 9.6 MW located at Jamnagar, Gujarat, India by Rohit surfactants Pvt.

Ltd. The wind farm harnesses wind energy potential in the Jamnagar district and intends to promote renewable energy by addressing the causative factors of low utilisation of renewable energy resources.
All the WTGs are connected to the regional grid and as per the Power Purchase Agreement ("PPA") the generated electricity is being sold to Gujarat Urja Vikas Nigam Limited (GUVNL). Enercon India Ltd. (EIL) is the equipment supplier and operations & maintenance contractor for the project activity.
As it is a green field project, scenario existing prior to the start of the project activity (=baseline scenario) would be electricity generation from the existing grid. Applying the simplified methodologies specified for small scale project activities, 9.6 MW wind energy project is expected to result in an annual emissions avoidance of 16,491 $tCO_2$ as compared with the baseline scenario of INDIAN grid (erstwhile NEWNE grid).

**Pre-project scenario: No Project Activity**

The project activity is a green field project, which means no power generation facility existed at the project site in the pre-project scenario. Hence, absence of any project activity is a befitting pre-project scenario at project site.

**Baseline scenario:**

The electricity produced by the project activity is supplied to state electricity board, which lies in Western regional grid (now a part of unified Indian Grid), as prescribed by Central Electricity Authority (CEA), country's apex power sector planning body, under the federal Government of India. In the absence of the project activity, same amount of electricity would have been delivered into the grid by the existing and fossil fuelfired power plants. The current project activity, therefore, precludes the emission of greenhouse gases (GHGs) that would have resulted in the absence of this renewable energy-based power project activity.
Hence, Western regional grid has been considered for baseline emission calculations for the project activity.
Evidently, the pre-project scenario is same as the baseline scenario.

**Estimated amount of emission reductions over the chosen crediting period:**

This project activity leads to an annual average GHG emission reduction of 16,491 $tCO_2e$ and renewable crediting period is chosen by project participant.

**Project activity's contribution towards sustainable development:**

The Designated National Authority (DNA) for the Government of India (GoI) in the Ministry of Environment and Forests (MoEFCC), called the National CDM Authority (NCDMA), has stipulated four indicators for sustainable development in the interim approval guidelines for CDM projects[4]:

**Social well being**

The project activity contributes to the sustainable development by harnessing wind potential in Gujarat thereby decreasing the gap between demand and supply. The project activity directly contributes to the development of the area. It increases the

[4] https://ncdmaindia.gov.in/

average income of the local people and also the downstream activities associated with the Erection and commissioning (E&C) of wind power plants such as transportation, communication etc. The project activity thus strengthens the rural economy.

- The project activity would augment power supply in the region that would aid the local population.
- generate employment in the region during construction as well as operation of the project activity.
- It would lead to generation of employment and development of the region.
- It would augment power supply in the region that would aid the local population.

**Economic well-being**
The project activity generates direct and indirect employment opportunities for skilled/semi-skilled manpower, during the construction and operational phase of the project. Indirect employment has been generated for the equipment supplier, contractors, and technical consultants. The project activity indirectly supports creation of local infrastructure like roads and other basic civic amenities leads to the economic development around the project area.
The project activity is displacing the grid electricity which is mostly fossil fuel based with wind power which is eco-friendly source of energy. Thus, the project activity results in reduction of GHGs. This contributes to the environmental well-being.

**Technological well being:**
The project activity leads to transfer of environmentally safe and sound technologies with a priority to the renewable sector or energy efficiency projects that are comparable to best practices in order to assist in up-gradation of technological base.

- The project activity demonstrates the use of wind based electricity generation, which would serve as an example for other industries to replicate

**Environmental well-being:**
Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

Hence, the project activity is in line with the sustainable development criteria laid down by the MoEFCC[5].

## A.2. Location of project

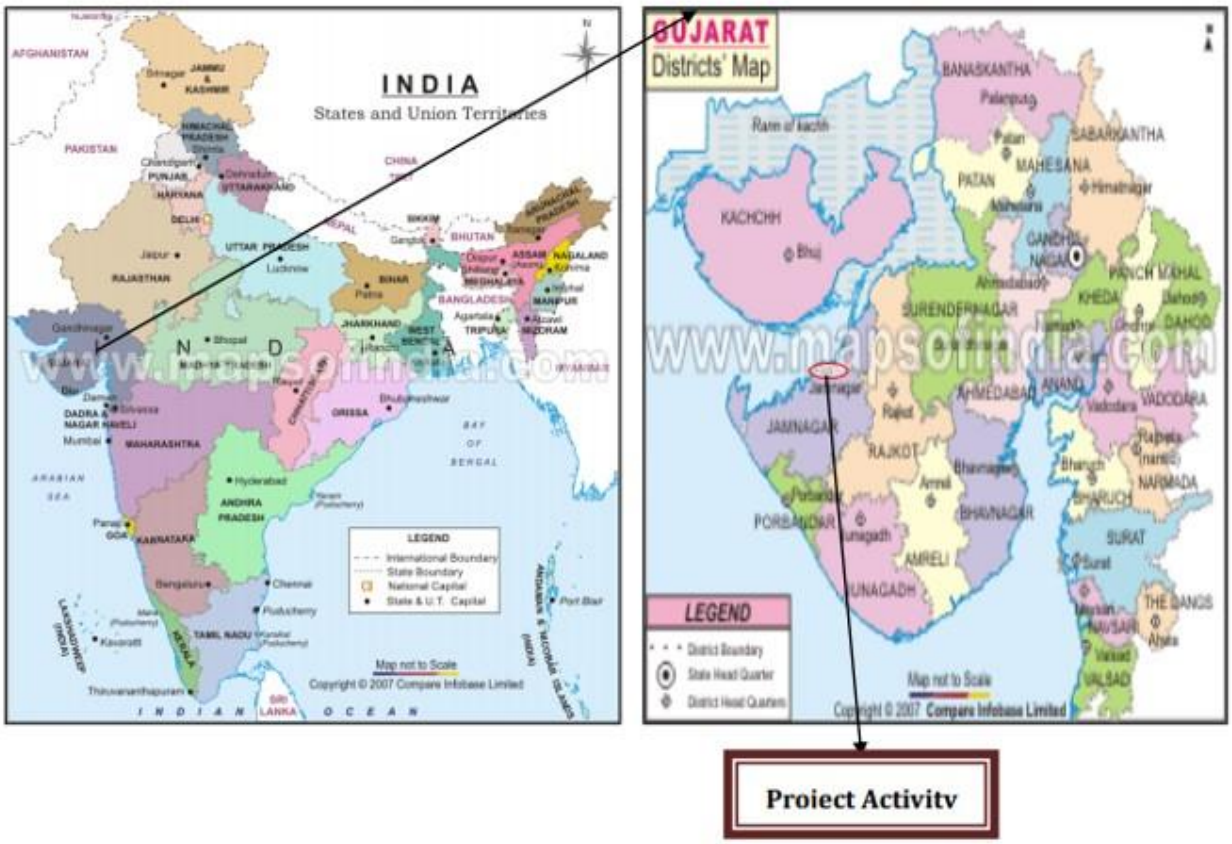
The project activity is located in district Jamnagar, state of Gujarat, India.
Village:Jamvadi & Navagam, Taluka : Kalavad

[5] Since June 2014, the name of India's Designated National Authority (DNA) for CDM changed from Ministry of Enviroonment and Forests to Ministry of Environment, Forest and Climate Change

The project activity consists of twelve WTGs each with capacity of 800 kW in the villages Jamvadi and Navagam in taluka Kalavad in district of Jamnagar in the state of Gujarat, India.
The specific geographical coordinates of the individual WTGs are as follows:

| Sr No | Village | Taluka & District | WTG Id Commissioning | Latitude (N) (D° M' Sec") | Longitude (E) (D° M' Sec") |
|---|---|---|---|---|---|
| 1 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0927 | N22$^0$ 7' 13.2" | E70$^0$ 18' 39.3" |
| 2 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0928 | N22$^0$ 7' 19.5" | E70$^0$ 18' 39.5" |
| 3 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0929 | N22$^0$ 7' 25.8" | E70$^0$ 18' 36.1" |
| 4 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0930 | N22$^0$ 7' 32.3" | E70$^0$ 18' 36.2" |
| 5 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0931 | N22$^0$ 08' 12.1" | E70$^0$ 18' 20.2" |
| 6 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0932 | N22$^0$ 08' 18.1" | E70$^0$ 18' 18.4" |
| 7 | Jamvadi | Kalavad, Jamnagar | EIL/800/07-08/0933 | N22$^0$ 08' 25.2" | E70$^0$ 18' 16.1" |
| 8 | Navagam | Kalavad, Jamnagar | EIL/800/07-08/01029 | N22$^0$ 03' 27.6" | E70$^0$ 16' 53.9" |
| 9 | Navagam | Kalavad, Jamnagar | EIL/800/07-08/01030 | N22$^0$ 53' 19.2" | E70$^0$ 16' 54.0" |
| 10 | Navagam | Kalavad, Jamnagar | EIL/800/07-08/01031 | N22$^0$ 03' 14.4" | E70$^0$ 17' 01.8" |
| 11 | Navagam | Kalavad, Jamnagar | EIL/800/07-08/01032 | N22$^0$ 03' 08.4 | E70$^0$ 17' 03.9" |
| 12 | Navagam | Kalavad, Jamnagar | EIL/800/07-08/01033 | N22$^0$ 03' 02.4 | E70$^0$ 17' 06.3" |

Map shows the exact location of the project activity.




## A.3. Reference of applied methodology

**Methodology** : AMS-I.D. "Grid connected renewable electricity generation" (Version 18.0)[6]
**Tool** : "Tool to calculate the emission factor for an electricity system" (Version 07.0)[7]

This GS4GG PDD has been developed using the latest version of methodology AMS-I.D version 18.0. The registered CDM PDD has referred the AMS-I.D version 18.0.

The latest version of methodology is AMS-I.D version 18.0 and the project activity meets the applicability and eligibility criteria of latest version of methodology also.

[6] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

[7] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

It is to be noted that as per latest version of Tool to calculate the emission factor for an electricity system" (Version 07.0) and latest version of $CO_2$ Baseline Database for the Indian Power Sector -Version 15.0) published by the Central Electricity Authority (CEA), Ministry of Power, Govt. of India, the combined margin emission factor is 0.9420 $tCO_2$/MWh. However as per registerd PDD, the combined margin emission factor is 0.9225 $tCO_2$/MWh. Since emission factor is registered PDD is lower than emission factor as per latest version of tool and CEA database, hence lower emission factor i.e 0.9225 $tCO_2$/MWh as per registered CDM PDD is considered as a conservative approach. Hence the GS4GG PDD refers version of CEA database as per CDM registered PDD and does not referred the latest version of CEA database.

### A.4. Crediting period of project

07/01/2018 to 07/09/2021

## SECTION B. IMPLEMENTATION OF PROJECT

### B.1. Description of implemented project

The project activity is a CDM Registered project having UNFCCC number as 4470[8] with a fixed crediting period of 08/09/2011 to 07/09/2021. As per GHG Emissions Reduction & Sequestration Product Requirements (v2.0) para 10.2.3 the start date of the crediting period with Gold Standard shall be the start date of the crediting period under CDM or maximum of two years prior to the date of first submission i.e., 07/01/2020 (submission for preliminary review). Therefore, the start date for CP will be 07/01/2018 under GS4GG

**Technical Description of the equipment:**
The technology consists of conversion of the energy available in the wind flow to mechanical energy using a wind turbine. By connecting the turbine to a generator, the mechanical energy is converted into electricity energy. Therefore, in this process, there are no greenhouse gas emissions or burning of any fossil fuels. Thus, electricity is generated through sustainable means without causing any negative effect on the environment and hence the technology is environmentally safe and sound.
The project employs the use of wind energy for the purpose of electricity generation. Since, the technology employed by the project proponent does not result in GHG emissions; the project does not cause any negative effects on the environment. Hence, the technology used for the project activities do not pose any threat to the environment when compared to the fossil fuel-fired power plants.

The project proponent uses proven technology for wind power generation. This technology is supplied by ENERCON India Ltd (EIL). The principle of wind energy is the conversion of kinetic energy in the wind into mechanical power at the rotor shaft. The rotor shaft is then coupled to the generator where it would be converted to electrical energy. These Enercon Make 800 kW WTGs feature variable speed and active pitch control. The Generator is flanged directly to the hub. This project activity generates 17,877 MWh of electricity per year

[8] https://cdm.unfccc.int/Projects/DB/SIRIM1297157809.18/view

**WTG TECHNICAL DATA**

| | |
|---|---|
| Turbine | Enercon |
| Rated Power | 800 kW |
| No. of Blades | 3 |
| Blade Material | Glass Fibre reinforced Epoxy |
| Tower | Tubular |
| Turbine Type | Gearless horizontal |
| Power regulation | Independent electro-mechanical pitch system for each blade |
| Cut-in wind speed | 3 m/s |
| Rated wind speed | 12 m/s |
| Cutout wind speed | 28 – 34 m/s |
| Extreme wind speed | 59.5 m/s |
| Rated rotational speed | 31.5 RPM |
| Operating range rot. Speed | 16 – 31.5 RPM |
| Orientation | Upwind |
| Gear box type | Gear less |
| Generator type | Synchronous generator |
| Braking | Aerodynamics |
| Output voltage | 400 V |
| Yaw system | Active yawing with 4 electric yaw drives with brake motor and friction bearing |
| Tower | Tubular |

### B1.1.1 Forward Action Requests

Not Applicable

## B.2. Post-Design Certification changes

### B.2.1.Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

Not Applicable

### B.2.2.Corrections

Not Applicable

### B.2.3.Changes to start date of crediting period

Not Applicable

### B.2.4.Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

Not Applicable

### B.2.5.Changes to project design of approved project

Not Applicable

## SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The purpose of the monitoring plan is to define the organizational structure of the monitoring team, monitoring practices, QA / QC procedures and archiving procedures. The monitoring plan aims to ensure that the emission reductions from the project activity are reported accurately and transparently.

**Roles and Responsibilities of the Monitoring Team**

Monitoring of emission reductions is carried out following the guidance provided in the applicable methodology for the project activity i.e. AMS-ID version 18, which requires monitoring of the parameter - Quantity of net electricity supplied to the grid from the project activity.

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement) with GUVNL.

Reading and correction of meters:

a) The WEGs of a single customer (RSPL in this case) at a particular site are connected to a 33 kV cluster meter which in turn connects to a feeder that ultimately leads to the shared main GETCO meter at the 220 kV substation. Data monitoring takes place at the 220 kV substation and at each WEG (through the SCADA system)

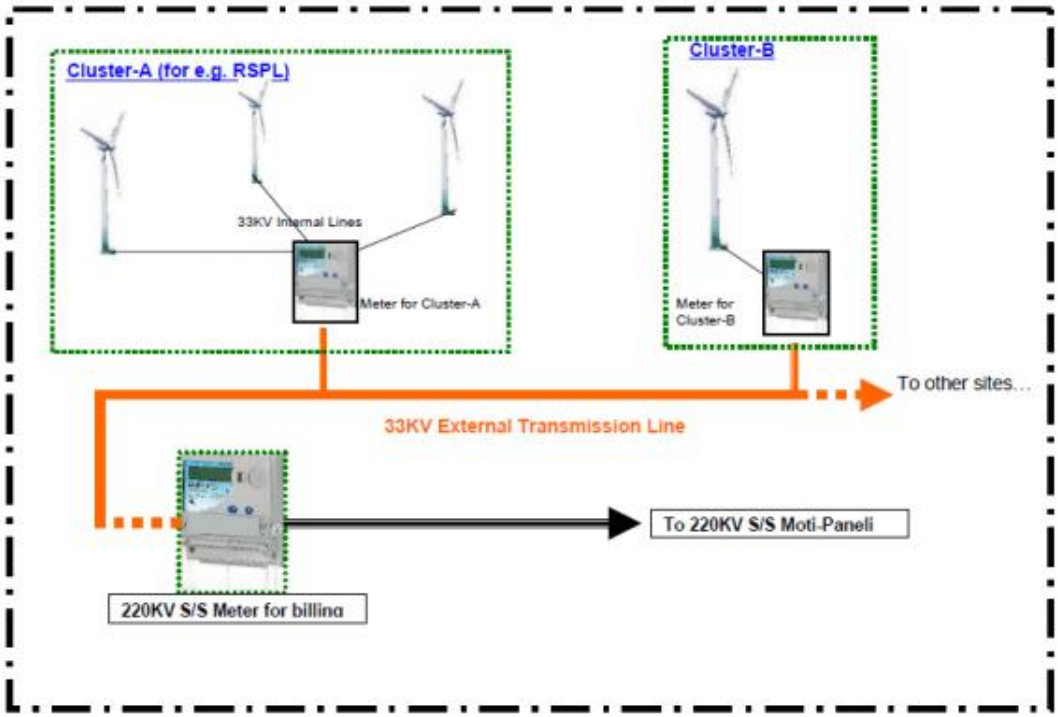
b) Site technician collects the generation readings from the WEGs every day and prepares the daily generation report. Through these collective reports of everyday, monthly generation figures are available

c) Cluster meter readings are also taken daily on the same day the WEG meter readings are taken to get the exact generation recording of these meter.

d) On the billing day decided by GEDA/GETCO/EIL, the reading of the 220 kV substation meter is taken at the same time of daily WEG readings by calculating in the pro-rata basis, the generated units are being allocated to individual customers according to the generated units

e) The emission reduction calculations are done on the basis of the GETCO Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued by GEDA on monthly basis. The following figure illustrates the metering arrangement for the RSPL project activity.

ELECTRICITY SHARE ALLOCATION PROCEDURE FOR WEC GENERATION




f) Whenever there is a major difference between the readings of the Main meter (220 kV substation meter and the 33kV cluster at Enercon Substation) at wind farm end, the following steps shall be taken.

i. Checking of CT and PT connections

ii. Testing of accuracy of meters at site and at GETCO meter (220 kV substation meter) If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter.

g) In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be immediately replaced with a correct meter.

h) Sealing and maintenance of meters:

i. The GETCO meter (220 kV substation meter) shall be sealed in the presence of representatives of RSPL / Enercon and GETCO.

ii. Any meter seal(s) shall be broken only by the GETCO representative in the presence of Enercon/RSPLs representative whenever the main metering system or the 33kV metering system is to be inspected, tested, adjusted, repaired or replaced.

iii. The GETCO meter at the substation is calibrated once in a year. The calibration of the meters installed in an individual WEG takes place on yearly basis in accordance with Enercon's operation & maintenance manual which is consistently followed at all Enercon sites across the world.

i) Records: Enercon maintains an accurate and up-to-date operating log at the project site with records of:

i. 24 Hours logs of real and reactive power generation, frequency, transformer tap position, bus voltage(s), Main meter and other meter readings and any other data mutually agreed.

ii. Any unusual conditions found during operation/inspections

iii. All the records are preserved for 2 years after the end of the crediting period.

j) The billing is on monthly basis. Enercon/RSPL shall raise invoice and submit to GUVNL for payment based on joint meter reading as certified by GEDA at the end of each month for the energy supplied

k) Billing for the failure period:

i. In the event that any GETCO meter fails to register or upon being tested, is found not to be accurate within ±0.2class the energy injected in the grid, shall for the period be measured on the basis of the value registered by the corresponding meter at the feeder end.

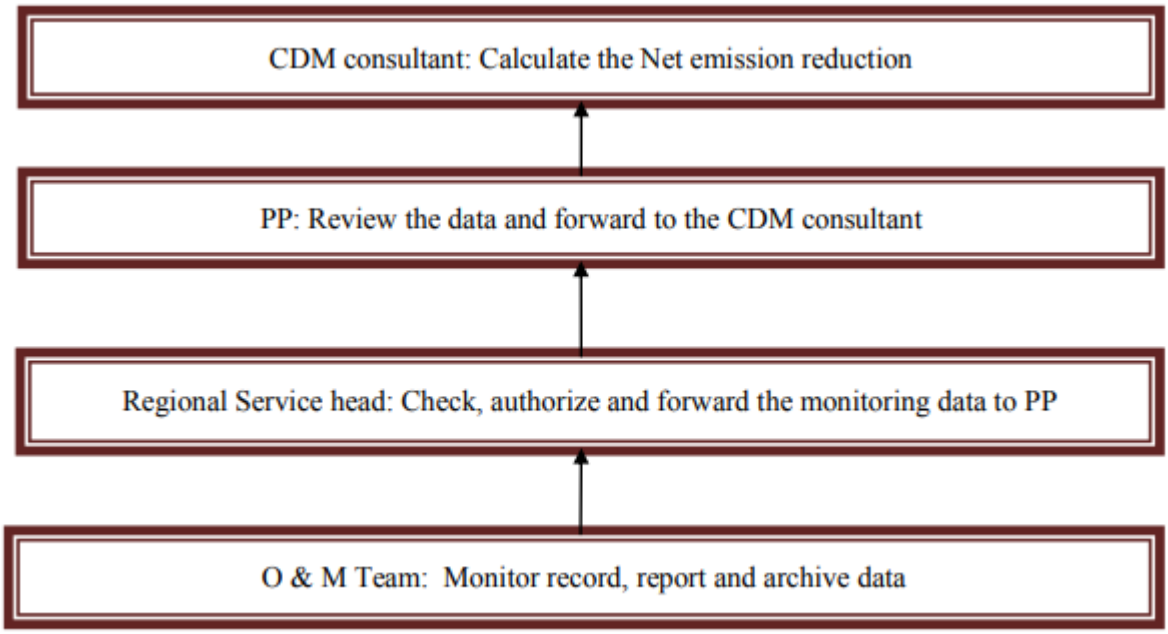
ii. In the event that both GETCO meter and the corresponding meter at the feeder end fail to register, or upon being tested, be found not to be accurate within ±0.2 / 0.5s the energy injected in the grid, shall for the period be adjusted by immediately restoring and recalibrating the GETCO meter and the corresponding cluster meter (33 kV substation) at the meter and the correction applied to the consumption registered by the GETCO meter.

iii. The period referred to in the two points above is the actual period during which inaccurate measurements were made if such period can be determined or, if not readily determinable, the shorter of:

a) The period since the immediately preceding test of the relevant Main meter; or

b) One hundred and eighty (180) days immediately preceding the test at which the relevant Main meter was determined to be defective or inaccurate

The project is operated and managed by Enercon (India) Ltd. The operational and management structure is as under:



# SECTION D. DATA AND PARAMETERS

## D.1. Data and parameters fixed ex ante or at renewal of crediting period

a. **SDG13: Climate Action:** The project would lead to reduction of 16,491 tCO2e per annum

b. **SDG 7: Affordable and Clean Energy:** The project is expected to generate 17,877 MWh of clean energy per annum

c. **SDG 8:** Decent Work and Economic Growth: The project provides employment to around 10 person and minimum 1 training per annum

**SDG13 (Indicators 13.2.1)**

| | |
|---|---|
| Data/parameter | **$EF_{grid,OM,y}$** |
| Unit | $tCO_2/MWh$ |
| Description | Operating Margin $CO_2$ emission factor in year y |
| Source of data | Referred from $CO_2$ Baseline Database for the Indian Power Sector prepared by Central Electricity Authority Version 5.0[9]. |
| Value(s) applied | 1.0050 |
| Choice of data or Measurement methods and procedures | The operating margin emission factor has been published by CEA in accordance with the 'Tool to calculate the emission factor for an electricity system." The option of ex ante calculation based on Simple Operating Margin Method have been applied using three years vintage data (2006-07, 2007-08 and 2008-09). |
| Purpose of data | Calculation of baseline emissions |
| Additional comment | This value is determined ex-ante and will be fixed for the crediting period. |

| | |
|---|---|
| Data/parameter | **$EF_{grid,BM,y}$** |
| Unit | $tCO_2/MWh$ |

[9] https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver5.pdf

| | |
|---|---|
| Description | Build Margin $CO_2$ emission factor in year y |
| Source of data | Referred from $CO_2$ Baseline Database for the Indian Power Sector prepared by Central Electricity Authority Version 5.0[10]. |
| Value(s) applied | 0.6752 |
| Choice of data or Measurement methods and procedures | The build margin emission factor has been published by CEA in accordance with the 'Tool to calculate the emission factor for an electricity system." The build margin is calculated as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. The build margin has been taken corresponding to the year 2008-09, the latest year for which data is available. |
| Purpose of data | Calculation of baseline emissions |
| Additional comment | This value is determined ex-ante and will be fixed for the crediting period. |

| | |
|---|---|
| Data/parameter | $\mathbf{EF_{grid,CM,y}/EF_{CO2,grid,y}}$ |
| Unit | $tCO_2/MWh$ |
| Description | Combined Margin $CO_2$ emission factor in year y |
| Source of data | Estimated figure based on 75% of OM and 25% of BM values |
| Value(s) applied | 0.9225 |
| Choice of data or Measurement methods and procedures | The combined margin emission factor has been determined based on data published by the CEA, applying a 75% weightage for $EF_{grid,\ OM,y}$ and 25% for $EF_{grid,BM,y}$ in accordance with the 'Tool to calculate the emission factor for an electricity system." |
| Purpose of data | Calculation of baseline emissions |
| Additional comment | The value is fixed ex-ante |

[10] https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver5.pdf

## D.2. Data and parameters monitored

### SDG 7 (Indicators 7.2.1)

| | |
|---|---|
| Data / Parameter | **$EG_{BL,y}$** |
| Unit | MWh |
| Description | Net Electricity supplied to the grid by the project activity |
| Source of data | Electricity Share Certificate issued by GEDA or GETCO |
| Value(s) applied | 30,303.88<br>The Vintage Wise values are described in the table below-<br>Year / Net Electricity<br>2018 / 2,498.87<br>2019 / 15751.60<br>2020 / 12053.41 |
| Measurement methods and procedures | Net electricity generated is calculated from the readings of export and import indicated by the main meter (220 kv substation meter) connected to the incoming feeder of GUVNL. The procedures for metering are as per the provisions of the power purchase agreement. The WEGs of a single customer (RSPL in this case) at a particular site are connected to a cluster meter (33 kV) which in turn connects to a feeder that ultimately leads to the shared main GETCO meter at the 220 kV substation maintained by Enercon India Limited.<br>Data monitoring takes place at the cluster meter (33 kV) and GETCO meter (220 kV) at the substation. The electricity metered at the GETCO meter is proportionally divided among the customers connected to the meter on the basis of the pro-rata readings taken at the cluster meter (33 kV). The emission reduction calculations are done on the basis of the GETCO Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued by GEDA on monthly basis.<br><br>The Calibration Details for the current monitoring period are shown in Appendix 1 |
| Monitoring frequency | **Monitoring:** Continuous<br>**Measurement:** Hourly<br>**Recording:** Monthly |
| QA/QC procedures | Annual calibration of all the meters is undertaken and faulty meters are duly replaced immediately. |
| Purpose of data | Calculation of baseline emissions |
| Additional comment | The data will be kept for two years after the crediting period or from last issuance. The values shall be monitored ex-post and CERs will be calculated at actual. |

| | |
|---|---|
| Data / Parameter | **$EG_{y,\ Export}$** |

| | |
|---|---|
| Unit | MWh |
| Description | Quantity of electricity exported to GUVNL facility |
| Source of data | Share certificate issued by GETCO monitored from the main GETCO meter |
| Value(s) applied | 1,355,908 |
| Measurement methods and procedures | Energy meters are used for this parameter. |
| Monitoring frequency | Monitoring continuous and Reported monthly.<br>The data is recorded everyday and monthly values are reported in the monthly share certificates issued by GETCO |
| QA/QC procedures | Annual calibration of all the meters will be undertaken and faulty meters will be duly replaced immediately. |
| Purpose of data | Baseline calculation |
| Additional comment | Electricity exported to GUVNL is being measured at the main meter connected to the incoming feeder of GUVNL. The procedures for metering is being followed as per the provisions of the power purchase agreement. This value is based on GETCO substation meter reading for wind farm which includes project activity WTGs and non project activity WTGs those are connected to the substation.<br>The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |

| | |
|---|---|
| Data / Parameter | $\mathbf{EG_{y,\ Import}}$ |
| Unit | MWh |
| Description | Quantity of electricity imported from GUVNL facility |
| Source of data | Share certificate issued by GETCO monitored from the main GETCO meter |
| Value(s) applied | 506 |
| Measurement methods and procedures | Energy meters are used for this parameter. |
| Monitoring frequency | Monitoring continuous and Reported monthly.<br>The data is recorded everyday and monthly values are reported in the monthly share certificates issued by GETCO |
| QA/QC procedures | Annual calibration of all the meters is to be undertaken and faulty meters to be duly replaced immediately. However, this could not happen during this monitoring period and delays were observed in the calibration of energy meters. Since the above parameter has no role in calculation of emission reductions, and only constitute a part of monitoring plan as per the registered PDD, hence error factor has not been applied. |
| Purpose of data | Baseline calculation |

| | |
|---|---|
| Additional comment | Electricity imported from GUVNL is being measured at the main meter connected to the incoming feeder of GUVNL. The procedures for metering is being followed as per the provisions of the power purchase agreement. This value is based on GETCO substation meter reading for wind farm which includes project activity WTGs and non- project activity WTGs those are connected to the substation.<br>The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later |

| | |
|---|---|
| Data / Parameter | **$EG_{y, WTG}$** |
| Unit | MWh |
| Description | Electricity generated by each WTG |
| Source of data | Daily generation reports provided by Enercon India Limited |
| Value(s) applied | 30,821.78 |
| Measurement methods and procedures | Monitored through inbuilt WTG integrated electronic meter |
| Monitoring frequency | Monthly |
| QA/QC procedures | The WTG integrated electronic meters are self-calibrating type and the same do not need calibration, this has been a standard practice in the wind farm. |
| Purpose of data | This data is not used for the calculation of emission reductions per say but would act as a backup data for the net electricity generated. This data is being recorded daily. |
| Additional comment | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |

| | |
|---|---|
| Data / Parameter | **$EG_{CM}$** |
| Unit | MWh |
| Description | Electricity generated at the Cluster Meter (CM) |
| Source of data | Daily generation reports provided by Enercon India Limited |
| Value(s) applied | 31,155.96 |
| Measurement methods and procedures | Energy meters are used for this parameter |
| Monitoring frequency | Measured & Recording Continuously and Reporting Daily |
| QA/QC procedures | As per the registered PDD the regular calibration of all the meters was to be undertaken yearly with an option of the faulty meters to be replaced immediately. However, this could not happen during this monitoring period and delays were observed in the calibration of energy meters. Since |

| | |
|---|---|
| | the above parameter has no role in calculation of emission reductions, and only constitute a part of monitoring plan as per the registered PDD, hence error factor has not been applied. There was no change in any of the meters during this monitoring period. |
| Purpose of data | This data is not used for the calculation of emission reductions per say but would act as a backup data for the net electricity generated. This data is also recorded daily. |
| Additional comment | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |

**SDG 13 (Indicators 13.2.1)**

| | |
|---|---|
| Data / Parameter | **$ER_y$** |
| Unit | $tCO_2e$ |
| Description | Emission reductions achieved for this monitoring period |
| Source of data | As per Esitimated ER sheet. During the verification, the results shall be obtained from the Actual ER sheet. |
| Value(s) applied | 27,955<br>The Vintage Wise values are described in the table below-<br>Year \| Net Electricity<br>2018 \| 2,305<br>2019 \| 14531<br>2020 \| 11119 |
| Measurement methods and procedures | The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor. |
| Monitoring frequency | As per monitoring period |
| QA/QC procedures | Not Applicable |
| Purpose of data | To Monitor the SDG 13 Indicator |
| Additional comment | Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of this project activity, whichever occurs later |

**SDG 8 (Indicators 8.5.1)**

| | |
|---|---|
| Data / Parameter | Number of employment generation |
| Unit | Number |
| Description | Number of people employed directly due to the project activity |
| Source of data | Plant records or The training records for all the employees/Letter from O&M contractor for employment |

| | |
|---|---|
| | generation/ DOE interview with employees, local stakeholders etc |
| Value(s) applied | 16 (Average based upon the 3 years values)<br><table><tr><th>Year</th><th>Skilled</th><th>Unskilled</th><th>Total</th></tr><tr><td>2018</td><td>11</td><td>5</td><td>16</td></tr><tr><td>2019</td><td>11</td><td>5</td><td>16</td></tr><tr><td>2020</td><td>11</td><td>5</td><td>16</td></tr></table> |
| Measurement methods and procedures | The total number of persons working in the plant would be calculated based on the daily log available at site.<br><br>This parameter also monitor number of men/women employed by the project activity. The project activity ensures that "equal pay for work of equal value" for both men and women and there is no any discrimination against women.<br><br>"The employment covers number of men and number of women employed by the project activity. The job is of type temporary/permanent or skilled/unskilled, etc. Also, it is ensued that peoples get equal payment for equal work. The payment is based on work and no any gender inequality for payment for work of equal value.<br><br>Further preference is given to the local people for employment in skilled and unskilled jobs based upon their skills and competency. The same can be verified at the time of verification. |
| Monitoring frequency | Monthly monitoring and annual compilation |
| QA/QC procedures | The number of persons employed would be mentioned in the plant register, which can be crossed checked with attendance register. |
| Purpose of data | To Monitor the SDG 8 Indicator |
| Additional comment | - |

**SDG8 (Indicators 8.6.1)**

| | |
|---|---|
| Data / Parameter | **Quality of Employment** |
| Unit | number |
| Description | Training of Staff |
| Source of data | Plant records or The training records for all the employees/Letter from HR Dept. for employment generation/ DOE interview with employees, local stakeholders etc |

<table>
<tr><td>Value(s) applied</td><td>5<br><br>Technical Training – 5<br><br>Non-Technical Training - 0<br><br>
<table>
<tr><th>Sr. No</th><th>Date</th><th>Topic</th><th>Total Number of People</th><th>Type</th><th>Name of Trainer</th></tr>
<tr><td>1</td><td>03/12/2018</td><td>Electrical Maintenance</td><td>4</td><td>Tech</td><td>Abhishek Choudhary</td></tr>
<tr><td>2</td><td>24/12/2019</td><td>Work at height</td><td>6</td><td>Tech</td><td>Pragnesh Soni</td></tr>
<tr><td>3</td><td>31/12/2019</td><td>Transformer Replacement</td><td>5</td><td>Tech</td><td>Ramesh Singh</td></tr>
<tr><td>4</td><td>15/04/2020</td><td>Awareness of Electric safety</td><td>6</td><td>Tech</td><td>Abhishek Choudhary</td></tr>
<tr><td>5</td><td>23/05/2020</td><td>Work at Height</td><td>6</td><td>Tech</td><td>Pragnesh Soni</td></tr>
</table></td></tr>
<tr><td>Measurement methods and procedures</td><td>Together with the technology supplier, the Project organise training for the staff on the technology and the monitoring of the plant operation, and the emergency and safety procedures.</td></tr>
<tr><td>Monitoring frequency</td><td>Annual</td></tr>
<tr><td>QA/QC procedures</td><td>The training records for all the employees</td></tr>
<tr><td>Purpose of data</td><td>To Monitor the SDG 8 Indicator</td></tr>
<tr><td>Additional comment</td><td>The data will be kept for two years after the crediting period or from last issuance.</td></tr>
</table>

Some Parameters namely- Electricity generated at the Cluster Meter(CM) ($EG_{CM}$) (MWh); Electricity generated by each WTG ($EG_{y,WEG}$) (MWh) ; Quantity of electricity exported to GUVNL facility $EG_{y, Export}$ (KWh) and Quantity of electricity imported from GUVNL facility $EG_{y,Import}$ (KWh) were a part of the CDM project in the previous monitoring , but since these parameters have no role in Emission Reduction Calculations , So they have been removed in this GS Monitoring Period.

### D.3. Comparison of monitored parameters with last monitoring period

| Data/Parameter | Value obtained in this monitoring period | Value obtained last monitoring period |
|---|---|---|
| $ER_y$ | N.A. | N.A. |
| $EG_{PJ, y}$ | N.A. | N.A. |
| Number of employment generation | N.A. | N.A. |
| Quality of Employment | N.A. | N.A. |

### D.4. Implementation of sampling plan

No Sampling is required.

# SECTION E. CALCULATION OF SDG IMPACTS

## E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

16,491 $tCO_2e$/annum (for SDG 13)
17,877 MWh (for SDG 7)
1 training /annum and 10 people employed (for SDG 8)

## E.2. Calculation of project value or estimation of project situation of each SDG Impact

**SDG 7: Affordable and Clean Energy**
For the current monitoring period, the clean energy generation contributed by the project activity 30,303.88 MWh.

**SDG 13: Climate Action:**

For the current monitoring period, the emission reductions contributed by the project activity ($ER_y$) is calculated as follows:

$$\mathbf{BE_y = EG_{BL,y} . EF_{grid,CM,\,y}}$$

Where:

| | | |
|---|---|---|
| $BE_y$ | = | Baseline emissions in year y (t $CO_2$) |
| $EG_{BL,y}$ | = | Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh |
| $EF_{grid,CM,y}$ | = | Combined margin $CO_2$ emission factor for grid connected power generation in year y |

$BE_y$ = 30,303.88 MWh x 0.9225 $tCO_2$/MWh
= 27,955 $tCO_2e$

$$\mathbf{ER_y = BE_y - PE_y}$$

Where:

$ER_y$ = Emission reductions in year y (t $CO_{2e}$)
$BE_y$ = Baseline emissions in year y (t $CO_{2e}$)
$PE_y$ = Project emissions in year y (t $CO_{2e}$)

Therefore, $ER_y$ = 27,955 – 0
= 27,955 $tCO_2e$

**SDG 8 : Decent Work and Economic Growth**

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project provides employment to 16 persons.

Also, project activity improves the quality of employment by giving training to employee. Thus 5 trainings has been conducted during the present monitoring period.

## E.3. Calculation of leakage

In accordance with para B.6.3 of the registered PDD the project emissions have been considered zero.

## E.4. Calculation of net benefits or direct calculation for each SDG Impact

| SDG | SDG Impact | Baseline estimate | Project estimate | Net benefit |
|---|---|---|---|---|
| 13 | Take urgent action to combat Climate Change and its impacts | 0 $tCO_2e$ | 27,955 $tCO_2e$ | 27,955 $tCO_2e$ |
| 7 | Ensure access to affordable, reliable, sustainable and modern energy for all | 0 MWh | 30,303.88 MWh | 30,303.88 MWh |
| 8 | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all | - | 16 people employed and 5 trainings | 16 people employed and 5 trainings |

## E.5. Comparison of actual SDG Impacts with estimates in approved PDD

| SDG | Values estimated in ex ante calculation of approved PDD for this monitoring period | Actual values[11] achieved during this monitoring period |
|---|---|---|
| 13 | 36,280 $tCO_2e$ | 27,955 $tCO_2e$ |
| 7 | 39,329.4 MWh | 30,303.88 MWh |
| 8 | 10 people employed and minimum 1 training per year | 16 people employed and 5 trainings |

### E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

**SDG7: Affordable and Clean Energy**

The annual estimated power generation for the project activity is 17,877 MWh, thus considering number of days covered during present monitoring period to be 803, the estimated power generation will be 39,329.4 MWh.

**SDG 13: Climate Action**

The annual estimated emission reduction for the project activity is 16,491 $tCO_2e$, thus considering number of days covered during present monitoring period to be 803, the estimated emission reduction contributing towards SDG 13 will be 36,280 $tCO_2e$.

[11] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

**SDG 8: Decent Work and Economic Growth**

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project provides employment at least 10 persons.

Also, project activity improves the quality of employment by giving training to employee. Thus minimum 1 training per year will be conducted by the project activity.

### E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

The Emission Reduction achieved are lower than the estimated value in the approved PDD.

## SECTION F. SAFEGUARDS REPORTING

As per the safeguarding Principle Assessment in Appendix-1 of the GS4GG PDD, there are no safeguarding principles which are to be included in the monitoring plan or hold any relevance to the project activity. Also, there are no any impact (positive/negative/slightly) for any mitigation measures, being applicable to any of the safeguarding principles. Hence, this section is not relevant.

## SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

### G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

As a part of continuous feedback from stakeholders, the grievances register is placed at site and is being continuously monitored and addressed through the grievances cell on regular basis and maintained in a register at site office.

Some of the inputs about the project/grievances and their resolution dates are shown below which had been received during the current monitoring period:

| S. No. | Date of Complaint | Name of the Stakeholder | Comment | Response by Project Participant | Designated Person |
|---|---|---|---|---|---|
| 1 | 17/09/2018 | Pankaj Thakur | No first aid facility available | First aid kit required | Nitesh Chouhan |
| 2 | 11/03/2019 | Shruti Mehta | No complain regarding the project | N.A. | Nitesh Chouhan |
| 3 | 11/11/2019 | Sunil Parmar | Drinking water not available | Water required for drinking | Nitesh Chouhan |
| 4 | 08/09/2020 | Vishal Patel | We are Happy with the Project | N.A. | Nitesh Chouhan |
| 5 | 18/11/2020 | Laxman Singh | Cleanliness and Hygiene not available | Staff assigned for regular cleaning | Nitesh Chouhan |

### G.2. Report on any stakeholder mitigations that were agreed to be monitored.

Not Applicable for the current monitoring period.

### G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

Not Applicable for the current monitoring period.

## Appendix – 1 Calibration Details

| Main Meter | Meter1 | Meter 2 | Meter 3 | Meter 4 |
|---|---|---|---|---|
| Location | Transformer 1 | Transformer 2 | Transformer 3 | Transformer 4 |
| Calibrating Agency | PGVCL | PGVCL | PGVCL | PGVCL |
| Serial Number | GJU04175 | GJU04176 | GJB01470 | KAB11082 |
| Type | E3M021 | E3M021 | E3M021 | E3M021 |
| Accuracy | 0.2s | 0.2s | 0.2s | 0.2s |
| Make | Secure | Secure | Secure | Secure |
| Previous Calibration | 20/06/2018 | 20/06/2018 | 20/06/2018 | 20/06/2018 |
| For the current Monitoring Period | 22/06/2019, 26/06/2020 | 22/06/2019, 26/06/2020 | 22/06/2019, 26/06/2020 | 22/06/2019, 26/06/2020 |
| Valid Till | 25/06/2021 | 25/06/2021 | 25/06/2021 | 25/06/2021 |
| Months in which error has been applied due to delay in calibration | Jun-19 and Jun-20 | Jun-19 and Jun-20 | Jun-19 and Jun-20 | Jun-19 and Jun-20 |

## Appendix – 2 Breakdown Details

| Duration | | WTG-ID | Breakdown Details | Reason for breakdown |
|---|---|---|---|---|
| 01/09/2019 | 30/09/2019 | RSPLJV-01 (0927) | 176:35:00 | Elec FB YawCW Error |
| 01/07/2020 | 31/07/2020 | RSPLJV-02 (0928) | 372:08:00 | Mech RpmFSS GenCnt DiffStop |
| 01/07/2020 | 31/07/2020 | RSPLJV-03 (0929) | 137:30:00 | Pitch ResolverEncoderDiff1Stop |
| 01/07/2020 | 31/07/2020 | RSPLJV-04 (0930) | 168:11:00 | Pitch ResolverEncoderDiff1Stop |
| 01/07/2020 | 31/07/2020 | RSPLJV-05 (0931) | 149:00:00 | Mech RpmFSS GenCnt DiffStop |
| 01/07/2020 | 31/07/2020 | RSPLJV-06 (0932) | 156:27:00 | Elec FB YawCW Error |
| 01/09/2019 | 30/09/2019 | RSPLJV-07 (0933) | 143:52:00 | Pitch AccuChargerStop |
| 01/07/2020 | 31/07/2020 | RSPLJV-07 (0933) | 151:23:00 | Rep Pitch CANComFail |
| 01/06/2019 | 30/06/2019 | RSPLDD-08 (01029) | 193:47:00 | Rep Pitch CANComFail |

| | | | | |
|---|---|---|---|---|
| 01/09/2019 | 30/09/2019 | RSPLDD-08 (01029) | 388:21:00 | Elec FB YawCW Error |
| 01/11/2019 | 30/11/2019 | RSPLDD-08 (01029) | 161:18:00 | SE RebootPLC |
| 01/06/2020 | 30/06/2020 | RSPLDD-08 (01029) | 295:25:00 | Pitch ResolverEncoderDiff1Stop |
| 01/08/2020 | 31/08/2020 | RSPLDD-08 (01029) | 155:54:00 | SE RebootPLC |
| 01/09/2020 | 30/09/2020 | RSPLDD-08 (01029) | 140:42:00 | Elec FB YawCW Error |
| 01/10/2020 | 31/10/2020 | RSPLDD-08 (01029) | 170:47:00 | Pitch AccuChargerStop |
| 01/06/2019 | 30/06/2019 | RSPLDD-09 (01030) | 224:09:00 | SE RebootPLC |
| 01/09/2019 | 30/09/2019 | RSPLDD-09 (01030) | 425:20:00 | Elec FB YawCW Error |
| 01/06/2020 | 30/06/2020 | RSPLDD-09 (01030) | 260:37:00 | Rep Pitch CANComFail |
| 01/08/2020 | 31/08/2020 | RSPLDD-09 (01030) | 174:14:00 | Pitch ResolverEncoderDiff1Stop |
| 01/10/2020 | 31/10/2020 | RSPLDD-09 (01030) | 152:43:00 | Pitch Akku1Voltage LowStop |
| 01/06/2019 | 30/06/2019 | RSPLDD-10 (01031) | 195:09:00 | Rep Pitch CANComFail |
| 01/09/2019 | 30/09/2019 | RSPLDD-10 (01031) | 417:31:00 | Pitch ResolverEncoderDiff1Stop |
| 01/10/2019 | 31/10/2019 | RSPLDD-10 (01031) | 190:15:00 | Pitch AccuChargerStop |
| 01/06/2020 | 30/06/2020 | RSPLDD-10 (01031) | 304:54:00 | Elec FB YawCW Error |
| 01/07/2020 | 31/07/2020 | RSPLDD-10 (01031) | 253:03:00 | Pitch AccuChargerStop |
| 01/08/2020 | 31/08/2020 | RSPLDD-10 (01031) | 191:00:00 | Rep Pitch CANComFail |
| 01/10/2020 | 31/10/2020 | RSPLDD-10 (01031) | 191:12:00 | Elec FB YawCW Error |
| 01/06/2019 | 30/06/2019 | RSPLDD-11 (10132) | 206:25:00 | Elec FB YawCW Error |

| | | | | |
|---|---|---|---|---|
| 01/09/2019 | 30/09/2019 | RSPLDD-11 (10132) | 383:04:00 | Pitch Akku1Voltage LowStop |
| 01/06/2020 | 30/06/2020 | RSPLDD-11 (10132) | 266:15:00 | Rep Pitch CANComFail |
| 01/07/2020 | 31/07/2020 | RSPLDD-11 (10132) | 210:40:00 | Natural Calamities |
| 01/10/2020 | 31/10/2020 | RSPLDD-11 (10132) | 156:04:00 | Elec FB YawCW Error |
| 01/06/2019 | 30/06/2019 | RSPLDD-12 (01033) | 220:29:00 | Elec FB YawCW Error |
| 01/09/2019 | 30/09/2019 | RSPLDD-12 (01033) | 416:07:00 | Pitch AccuChargerStop |
| 01/06/2020 | 30/06/2020 | RSPLDD-12 (01033) | 251:05:00 | Rep Pitch CANComFail |
| 01/08/2020 | 31/08/2020 | RSPLDD-12 (01033) | 188:32:00 | Elec FB YawCW Error |
| 01/09/2020 | 30/09/2020 | RSPLDD-12 (01033) | 197:29:00 | Pitch AccuChargerStop |
| 01/10/2020 | 31/10/2020 | RSPLDD-12 (01033) | 192:16:00 | Pitch ResolverEncoderDiff1Stop |

## Revision History

| Version | Date | Remarks |
|---|---|---|
| 1.1 | 14 October 2020 | Hyperlinked section summary to enable quick access to key sections<br>Improved clarity on Key Project Information<br>Section for POA monitoring<br>Forward action request section<br>Improved Clarity on SDG contribution/SDG Impact term used throughout<br>Clarity on safeguard reporting<br>Clarity on design changes<br>Leakage section added for VER/CER projects<br>Addition of Comparison of monitored parameters with last monitoring period<br>Provision of an accompanying Guide to help the user understand detailed rules and requirements |
| 1.0 | 10 July 2017 | Initial adoption |