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WIND POWER PROJECT BY RAJASTHAN GUM PRIVATE LIMITED (EKIESL-CDM.SEPTEMBER-12-02)



India's Largest Carbon Credit Developer & Supplier

Document Prepared by EKI Energy Services Limited

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Prepared By	Tapti Saha Assistant Manager-Operations EKI Energy Services Limited
Contact	EnKing Embassy, Office no. 201, Plot 48, Scheme 78 Part 2, Vijay Nagar Near Brilliant Convention Centre, Indore – 452010, Madhya Pradesh, India Website: www.enkingint.org Email ID: tapti@enkingint.org T: +91 731 42 89 086, M: +91 9109120940

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Purpose of the project activity:

The proposed CDM project activity is the installation of 7 WTGs having total installed capacity of 14.7 MW. The project will generate energy through renewable source i.e. wind which is a clean energy generating technology, replaces anthropogenic emissions of greenhouse gases (GHG's), which is estimated to be approximately 24,923 tCO_{2e} per year, thereon displaces 26,008 MWh amount of electricity from the generation-mix of power plants connected to the NEWNE¹ regional grid, which is mainly dominated by thermal/fossil fuel based power plant.

The detailed list of WTG and the state of installation is mentioned in the table:-

Project Promoters' Name	WTG No.	Site	Capacity in MW	State	Purpose
Rajasthan Gum Private Limited	WTG1	Jath	1 x 2.1 MW	Maharashtra	Sale to Grid
	WTG2		1 x 2.1 MW	Maharashtra	Sale to Grid
	WTG3		1 x 2.1 MW	Maharashtra	Sale to Grid
	WTG4		1 x 2.1 MW	Maharashtra	Sale to Grid
	WTG5	Kaladunger	1 x 2.1 MW	Rajasthan	Sale to Grid
	WTG6		1 x 2.1 MW	Rajasthan	Sale to Grid
	WTG7		1 x 2.1 MW	Rajasthan	Captive Usage

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 24,923 tCO_{2e} per year, thereon displacing 26,008 MWh amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The owners of the WTGs are:-

¹ In registered CDM PDD, NEWNE grid was mentioned which has been now integrated into national grid.

The total electricity generation in this monitoring period is 125,197 MWh and the GHG emission in the monitoring period is 119,956 tCO_{2e}.

1.2 Sectoral Scope and Project Type

Sectoral Scope : 01 - Energy industries (renewable / non-renewable sources)
 Project Type : I - Renewable Energy Projects
 Project Category : D.- Grid-connected electricity generation from renewable sources
 AMS-I.D.- Version 17.0 ²

1.3 Project Proponent

Organization name	Rajasthan Gum Private Limited
Contact person	Mr. Bheru Jain
Title	CEO
Address	S-272/342005 M.I.A II Phase, Jodhpur, Rajasthan
Telephone	+91 291-2764192
Email	bherujain@rahasthangum.com

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Mr. Manish Dabkara
Title	MD & CEO
Address	Office No. 201, Enking Embassy, Plot No. 48, Scheme No. 78, Part II, Vijay Nagar, Indore-452001
Telephone	+91 731 4289086
Email	manish@enkingint.org

²<https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

1.5 Project Start Date

The project start date for this project is 28-September-2012. This is the day on which first WTG was commissioned under the project activity.

1.6 Project Crediting Period

The project crediting period is of 10 years.

Start Date of Crediting Period: 28-September-2012

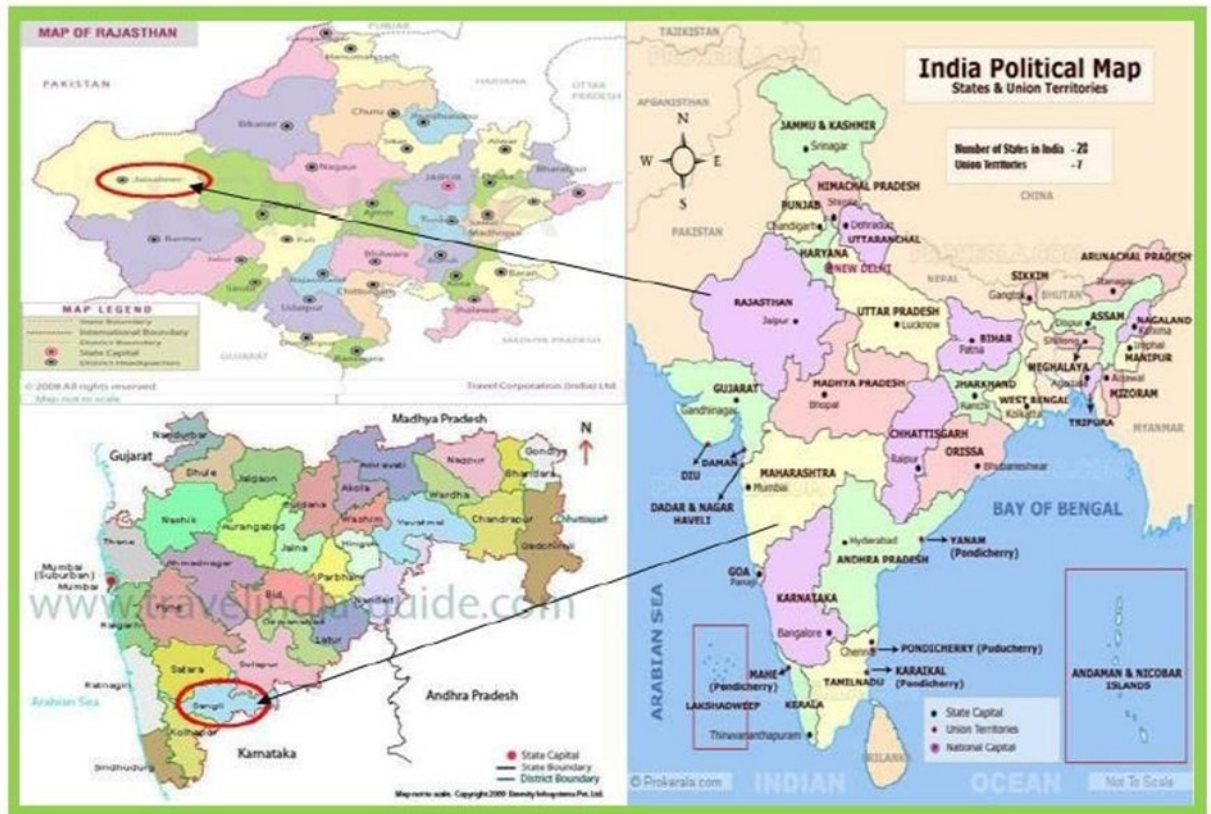
End Date of Crediting Period: 27-September-2022

1.7 Project Location

Host Party	: India
Region	: Western
State	: Maharashtra and Rajasthan
District	: Sangli and Jaisalmer
Village	: Yeldhari and Kanod
Taluka	: Jath and Mohangarh

The project is located at Maharashtra and Rajasthan state of India and the project location is depicted in the table below:

Project Promoter's Name	WTG No.	Village	Tehsil	District	State	Latitude	Longitude
Rajasthan Gum Private Limited	JTH-67	Yeldhari	Jath	Sangli	Maharashtra	N16 59' 28.4"	E75 12' 03.8"
	JTH-152	Mendhgiri				N16 58' 26.7"	E75 14' 17.8"
	JTH-158					N16 58' 50.7"	E75 13' 35.5"
	JTH-183	Jath				N17 03' 09.4"	E75 15' 15.0"
	KD- 89	Kanod	Mohangarh-1	Jaisalmer	Rajasthan	N27 09' 38.2"	E71 07' 31.7"
	KD- 86					N27 09' 17.4"	E71 07' 00.1"
	KD- 84					N27 08' 29.2"	E71 05' 54.3"



1.8 Title and Reference of Methodology

The methodology applicable to this project activity is “Grid connected Renewable Electricity Generation – AMS-I.D.”, Version 17 Sectoral Scope: 01.

Title: Grid connected renewable electricity generation

Reference : AMS I. D (Version 17, EB 61)³

1.9 Participation under other GHG Programs

This project activity has been registered under CDM Mechanism and the reference number is UN10026. The weblink is

<https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1408957529.49/view> .

The project proponent (PP) has submitted undertaking that they will not claim same GHG emission reductions of the project from CDM and VCS. PP would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding

³<https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQQOQFQQH45BK>

limits on GHG emissions. PP has also submitted undertaking for not availing other forms of environmental credit for the same crediting period under consideration.

Further, the Project is not rejected by any other GHG programs.

1.10 Other Forms of Credit

India is Non-annex1 country and there is no compliance with an emission trading program or to meet binding limits on GHG emissions for this project activity. The project is registered under CDM with registration ID 10026. Project Proponent has submitted undertaking that they will not claim same GHG emission reductions of the project from CDM and VCS. PP would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding limits on GHG emissions.

Project has been registered with UNFCCC under Clean Development Mechanism program. Registration reference number is 10026. Project Proponent has submitted undertaking for not availing other forms of environmental credit for the same crediting period under consideration.

PP has also submitted an undertaking stating that they will not take REC benefits for the same Emission Reductions.

1.11 Sustainable Development

Sustainable development indicators

The Ministry of Environment Forest & Climate Change (MoEFCC), which is the Designated National Authority (DNA) for the Government of India (GOI) has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India . Thus, the project's contribution towards sustainable development has been addressed based on the following sustainable development aspects:

Social well being

The project activity provides job opportunity to local people during erection, commissioning and maintenance of the wind machines. Frequency of visiting villages and nearby areas by skilled, technicians and industrialist, increase due to installation /site visit/operation and maintenance work related to WTGs. This directly and indirectly positively effects the economy of villages and nearby area.

Environmental well being

The Wind power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible.

Thus the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

Economic well being

The CDM project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and life style of the area.

Technological well being

The project activity is step forward in harnessing the untapped wind potential and further diffusion of the wind technology in the region. The project activity leads to the promotion of WTGs and demonstrates the success of wind turbines in the region which further motivate more investors to invest in wind power projects. Hence, the project activity leads to technological well-being.

2 SAFEGUARDS

2.1 No Net Harm

The project activity has no significant impact on the environment. wind power projects are not included in the Schedule I of the EIA notification S.O.1533 (E) dated 14th September 2006 and thus an EIA is not required. Ministry of Environment Forests & Climate Change vide their OM J-11013/41/2006 - IA II (I) dated 13th May 2011, has re-affirmed this and exempted wind power plants from EIA and Environmental Consent requirement.⁴

Hence, there are no significant environmental impacts due to implementation of the project activity.

2.2 Local Stakeholder Consultation

The local stakeholder meeting was carried out for the project activity and the details of the same can be referred from the registered VCS PD.

As a part of continuous feedback from stakeholders, the PP also placed a grievance register onsite where-in, the stakeholders can put down their complaint and the same if found genuine are addressed immediately.

Some of the inputs about the project/grievances and their resolution dates are shown below

⁴ <http://environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf>

Sl. No	Date of Complaint	Site	Topic	Date of Resolution	Remark from PP
1	06-May-2016	Maharashtra	Street lights not working	18-May-2016	Street lights have been changed
2	29-August-2017	Rajasthan	Request to repair RO at the primary school	30-August-2017	RO purifier was repaired

2.3 AFOLU-Specific Safeguards
Not Applicable.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity entails installations of wind turbines having a total capacity of 14.7 MW each of 2.1 MW are installed in this project activity. One WTG is captive.

The commissioning details of the WTGs are provided in the table below:

Sl. No.	WTG ID	Commissioning Date
1	JTH-67	11-January-2013
2	JTH-152	30-October-2012
3	JTH-158	28-September-2012
4	JTH-183	21-March-2013
5	KD-84	24-January-2013
6	KD-86	24-December-2012

Technical Detail of the WTGs

S-88 (2.1 MW)

OPERATING DATA	Rated power	2.1 MW
	Cut-in wind speed	4m/s
	Rated wind speed	14m/s
	Cut-out wind speed	25m/s
	50 years gust wind speed	59.5m/s
	Hub height	80m & 100 m
	Wind Class	IIA
	Rotational Speed	15.1 - 17.7 rpm
ROTOR	Pitch system	Electric drive with electric brake, gearbox, frequency converter & batteries.
	Diameter	88m
	Swept area	6,082m ²
	Blade material type	Fiberglass / Epoxy
GENERATOR	Type	Induction generator with slip rings, variable rotor resistance with Suzlon Flexi slip control system
	Rated power	2,100 kW
	Rated voltage	690 / 600V
	Frequency	50 / 60Hz
	Protection	IP54 & IP23 (for slip rings)
	Cooling system	Air cooled (IC6A1A6)
	Insulation	Class H
	Slip control	Flexi-Slip providing slip up to 16.7%
BRAKING SYSTEM	Aerodynamic brake	3 independent systems with blade pitching
	Mechanical brake	Hydraulic disc brake, activated by hydraulic pressure
GEARBOX	Type	3 stages (1 planetary & 2 helical)
	Ratio	1:98.8 (±0.5%)
	Nominal load	2,310 kW
YAW SYSTEM	Type	Electric motors with brake, gearbox & pinion
	Bearings	Friction bearing with gear rim
CERTIFICATIONS	Design standards	GL 2003 with supplement 2004
	Quality	ISO 9001:2008
TOWER	Type	Tubular in 4 sections

Parameter		S97	S111
Operating Data	Wind Class	IEC IIIA	IEC IIIA
	Rated Power	2,100 kW	2,100 kW
	Cut-in Wind Speed	3.5 m/s	3 m/s
	Rated Wind Speed	11 m/s	10 m/s
	Cut-out Wind Speed	20 m/s	21 m/s
Rotor	Rotor Diameter	97 m	111.8 m
	Swept Area	7,386 m ²	9,817 m ²
Generator	Frequency	50 / 60 Hz	50 / 60 Hz
	Type	Asynchronous 3 phase induction generator with slip rings operated with rotor circuit inverter system (DFIG)	
Tower	Hub Heights	90 m / 120 m*	
	Type	Tubular Steel Tower / Hybrid Lattice - Tubular Tower*	
Blade	Suzlon Make	SB47	SB54

S95

Description	Information
Rated power	2.1 MW
Rotor speed	12.1 to 17.6 rpm
Power regulation	Active pitch regulated
Rated wind speed	11.0 m/s (without turbulence intensity according to GL guideline)
Cut in wind speed (30-second average)	3.5 m/s
Cut out wind speed (3-second average)	34.0 m/s
Cut out wind speed (10-minute average)	25.0 m/s
Restart wind speed (10-minute average)	23.0 m/s

3.2 Deviations

2.3.1 Methodology Deviations

Not Applicable.

2.3.2 Project Description Deviations

Not Applicable.

3.3 Grouped Projects

Not Applicable.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF_{grid,OM,y}
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 08, Dec 2013 ⁵
Value applied	0.9723
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 04.0” as 3-year generation weighted average using data for the years 2009-2010, 2010-2011, & 2011-2012. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 8.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period

Data / Parameter	EF_{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 08, Dec 2013 ⁶
Value applied	0.9164
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 04.0” for the year 2011-2012. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector”

⁵ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver8.pdf

⁶ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver8.pdf

	version 8.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period

Data / Parameter	EF_{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 08, Dec 2013 ⁷
Value applied	0.9582
Justification of choice of data or description of measurement methods and procedures applied	Calculated using the CM approach as per “Tool to calculate the emission factor for an electricity system , version 04.0” The data reflects the Combined Margin Emission Factor of the NEWNE Grid for the year 2011-12
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period

4.2 Data and Parameters Monitored

Data / Parameter	EG _{Bl,y,RJ}
Data unit	MWh/yr
Description	Quantity of net electricity supplied to the grid from the WTGs in year y (MWh)
Source of data	1) Breakup of Net Export as per Monthly Generation Report and Joint Meter Reading authorized by R.R.V.P.N.L. 2) The quantity of net electricity supplied to the grid (i.e. Net Export in kWh) by the project activity will be taken from the break-up sheet prepared by Suzlon India Limited on the basis of monthly Joint Meter Reading (JMR) certificate certified by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPL). The value for net electricity supplied to the grid will be cross verified from the monthly invoice raised by the project participant.
Description of measurement methods and procedures to be applied	Metering at 33 kV/220 kV level: The electricity generated by the project activity WTG/s is evacuated to the pooling station at 33 kV/220 kV level. The project activity WTG/s along with other WTGs, are connected to the feeder-wise metering point/s, where each metering point consists of both main &

⁷ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver8.pdf

check meters. These energy meters (type: tri-vector) are having accuracy class of 0.2s.

The joint meter reading is taken on monthly basis at these metering point/s by the representatives of PP & State Utility, which records parameters like export, import.

The electricity (export and import) for the connected WTG/s is apportioned on monthly basis by the State Utility at 33 kV/220 kV level on the basis of generation ratio at the applicable metering point (ratio of controller reading of connected WTG to the controller reading for all WTGs connected to the applicable metering point) and the electricity (export, import etc) recorded by the energy meters at 33 kV/220 kV GSS on monthly basis. It will give export kWh & import kWh for connected WTG. The net export obtained at 33 kV/220 kV level for any given month for the connected WTG is then obtained by:

Net Export = Export kWh – Import kWh

All these metering points are further connected to the common delivery point at the 220 kV level.

Metering at 220 kV level:

The common metering point at 220 kV GSS concurrently records total electricity (total export and total import) receiving from all connected metering points. The common metering point consists of both main & check meters. These energy meters (type: tri-vector) are having accuracy class of 0.2s. The monthly JMR is taken by the representative of PP & State Utility.

Billing of the energy will be done based on the energy break up available at the metering at 220 kV level.

Transmission loss:

The total transmission loss occurred during export of the electricity between the 33/220 kV level pooling station & 220 kV level common delivery point is calculated as the difference between total aggregated reading of exports for all metering points at 33/220 kV level and the total reading of exports for same metering points recorded at the 220 kV level. Similarly, transmission loss occurred during import of the electricity is also calculated.

The PP/WTG wise transmission loss during export & import is calculated by multiplying the values of arrived transmission loss for export & import for wind farm with the Generation Ratio at common

	<p>delivery point (ratio of electricity generated by installed WTG to the total generation by all the connected WTGs/ or connected metering points under common delivery point).</p> <p>The values of transmission loss during export & import for the given WTG are subtracting from EGExport, metering point & EGImport, metering point respectively to get the values of export and import respectively for the given month.</p> <p>Net electricity delivered to the Grid:</p> <p>The net electricity delivered to the Grid by the given WTG for the given month (net export kWh) is then obtained by subtracting import from export.</p> <p>The values of the net electricity delivered to the Grid are aggregated annually to get $EG_{BL,y}$.</p> <p>The value of net electricity delivered to the Grid ($EG_{BL,y}$) by the project activity per annum is converted to MWh before the calculation of emission reductions.</p>
Frequency of monitoring/recording	Monthly
Value monitored	52,094.84
Monitoring equipment	Energy meters with accuracy class of 0.2s.
QA/QC procedures to be applied	Monthly
Purpose of the data	<ul style="list-style-type: none"> ■ Annual Testing of all the meters will be undertaken and faulty meters will be duly replaced immediately. ■ However the meters will be calibrated at-least once in 3 years. <p>The Net Units generated will be cross checked against the invoice raised by the Project Investor towards the Discom</p> <ul style="list-style-type: none"> ■ The energy meter is of 0.2 accuracy class.
Calculation method	$EG_{BL,y,R,J} = EG_{Export} - EG_{Import}$
Comments	The Data/Parameter is required to calculate the baseline emission
Data / Parameter	$EG_{Bl,y,MH}$
Data unit	MWh/yr

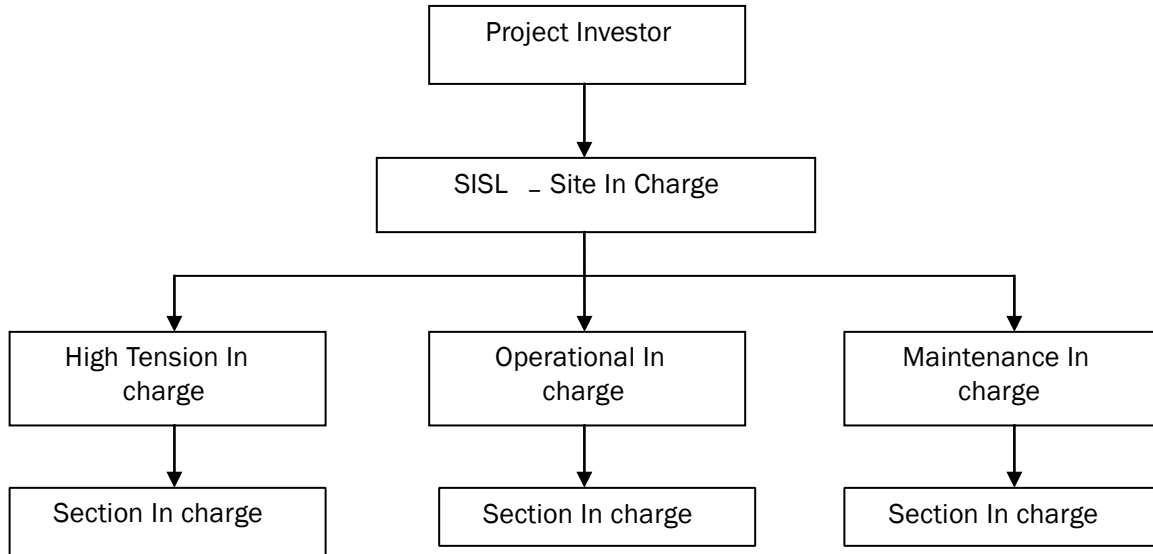
Description	Quantity of net electricity supplied to the grid from the WTGs in year y (MWh)
Source of data	Credit Report as per Monthly Generation Report
Description of measurement methods and procedures to be applied	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy: Paper & Electronic Calibration frequency: Annually Electricity exported to the grid is in kWh. However for the calculation purpose electricity exported is converted in MWh.
Frequency of monitoring/recording	monthly recording
Value monitored	73,103.01
Monitoring equipment	Energy meters with 0.2s accuracy class
QA/QC procedures to be applied	Annual calibration of all the meters will be undertaken at required intervals and faulty meters will be duly replaced immediately. The meters will be of accuracy class 0.2.
Purpose of the data	The Data/Parameter is required to calculate the baseline emission
Calculation method	$EG_{BL,y,MH} = EG_{Export} - EG_{Import}$
Comments	Data will be archived electronically for a period of 2 years beyond the end of crediting period.

4.3 Monitoring Plan

Monitoring Plan at Rajasthan State

A detailed description of metering measurements methods procedures to be applied to the project activity has been well incorporated in section 4.2, favouring Rajasthan-sites.

The organizational hierarchy of Project Proponent & Suzlon Infrastructure Services Ltd. (SISL) Project management is as follows:



Monitoring Plan:

QA/QC Procedures:

The main and backup meter installed at connected substations for monitoring of the project activity are electronic tri-vector energy meters of 0.2 accuracy class. Each meter is jointly inspected and sealed on behalf of project proponent and RRVPNL, in the presence of its authorized representatives. All main and backup meter are calibrated annually by RRVPNL or its representatives.

a) Description of calibration of WTG Controller

The controller used for the WTGs which is a SCS Controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. It uses a Woodward Multi function Relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current / voltage is converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVAh, kVArh and kWh. These instantaneous values are then time integrated and displayed / stored. Woodward relay is having no display and needs special protocol to view energy readings as this relay is communicating digital signal through special communication protocol. Moreover, turbine cannot run without this relay hence it cannot be removed for calibration, hence, it is not possible to calibrate.

Data Management and Data Archiving:

Copies of the break-up sheet, invoices raised on Discom and sales receipts will be retained and archived for the entire crediting period plus two years by the project proponent.

Procedures for Data Adjustments/Uncertainties:

Data uncertainty in the project activity monitoring could occur under the following circumstances:

1. During the monthly joint meter reading at connected substations, the reading of the main meter and backup meter are cross checked to insure that the meters are working within the permissible limit. If during the cross checking the reading is found to be outside the permissible limit of accuracy, then calibration is done to identify the meter with the error and the faulty meter is replaced immediately. The meter reading for that month is to be taken from the correct meter.
2. During the monthly joint meter reading at the connected substations, if the display defect is in the main meter than in that case the backup meter reading are considered for the purpose of preparation of the break-up sheet and billing purpose. Defective main meter will be replaced immediately.
3. During the monthly joint meter reading at the connected substation, if the display defect is in the check meter than in that case the main meter reading are considered for the purpose of preparation of the break-up sheet and billing purpose. Defective check meter will be replaced immediately.
4. If during the annual calibration of the meters at the connected substations, the main meter is found to be outside the permissible limit of accuracy and if the main meter reading have been used to prepare the break-up sheet, then the identified error would be applied to all the measured value since the date of last calibration. Further the main meter would be replaced immediate.
5. If during the annual calibration of the meters the connected substations, the check meter is found to be outside the permissible limit of accuracy and if the check meter reading have been used to prepare the break-up sheet, then the identified error would be applied to all the measured value since the date of last calibration. Further the check meter would be replaced immediate.

Procedure for data apportioning:

Apportioning of net electricity generation from each WTG located at Rajasthan determined by SEB is as follows:

The apportioning of the electricity is the responsibility of the State Utility. The sample apportioning procedure adopted for any given WTG for any given month is given below:

Generation Ratio at metering point (33 kV/220 kV level GSS): The generation ratio is the ratio of electricity generated by installed WTG of PP to the total generation by all the connected WTGs to the applicable metering point.

$$\text{GR, metering point} = \frac{\text{EG Controller, WTG}}{\text{EG Controller, metering point}} \quad \text{(a)}$$

Where,

$\text{GR, metering point}$: Generation Ratio at metering point

$\text{EG}_{\text{Controller, WTG}}$: Electricity generated by installed WTG of PP connected to the applicable metering point

$\text{EG}_{\text{Controller, metering point}}$: Total generation by all the connected WTGs to the applicable metering point

Calculation of net electricity exported at applicable metering point:

The Main and Check meters at the applicable metering point measure a number of parameters including export and import for all the connected WTGs.

The import, kWh by the WTG at the metering point is calculated in the following manner:

$$\text{EG Import, metering point} = \text{GR, metering point} \times \text{EG Total Import, metering point} \quad \text{(b)}$$

Where,

$\text{EG}_{\text{Import, metering point}}$: Import, kWh by the WTG at the metering point

$\text{GR, metering point}$: Generation Ratio at metering point

$\text{EG}_{\text{Total Import, metering point}}$: Total Import, kWh by all the WTGs at the metering point

The export, kWh by the WTG at the metering point is calculated in the following manner:

$$\text{EG Export, metering point} = \text{GR, metering point} \times \text{EG Total Export, metering point} \quad \text{(c)}$$

Where,

$\text{EG}_{\text{Export, metering point}}$: Export, kWh by the WTG at the metering point

$\text{GR, metering point}$: Generation Ratio at metering point

$\text{EG}_{\text{Total Export, metering point}}$: Total Export, kWh by all the WTGs at the metering point

The net electricity exported by the WTG at the 33 kV/220 kV level metering point is calculated by subtracting equation (b) from (c).

Thus, the net electricity exported at 33 kV/220 kV level metering point:

$$= \text{EG Export, metering point} - \text{EG Import, metering point} \quad (d)$$

Transmission Loss Calculation:

The total transmission loss occurred during export of the electricity between the 33/220 kV level pooling station & 220 kV level common delivery point is calculated as the difference between total aggregated reading of export for all metering points at 33/220 kV level and the total reading of export for same metering points recorded at the 220 kV level. Similarly transmission loss occurred during import of the electricity is also calculated.

The PP/WTG wise transmission loss during export & import is calculated by multiplying the values of arrived transmission loss for export & import for wind farm with the Generation Ratio at common delivery point.

Generation Ratio at common delivery point:

It is the ratio of electricity generated by installed WTG to the total generation by all the connected WTGs/ or connected metering points under common delivery point.

$$\text{GR, Common Delivery Point} = \frac{\text{EG Controller, WTG}}{\text{EG Controller, Common Delivery Point}} \quad (e)$$

Where,

$\text{GR}_{\text{Common Delivery Point}}$: EG Controller, Common Delivery Point

$\text{EG}_{\text{Controller, WTG}}$: Electricity generated by installed WTG

$\text{EG}_{\text{Controller, Common Delivery Point}}$: Total generation by all the connected WTGs/ or connected metering points under common delivery point

Calculation of net electricity delivered to the Grid:

The values of transmission loss during export & import for the given WTG are subtracting from EG Export, metering point & EG Import, metering point respectively to get the values of export and import respectively for the given month.

The net electricity delivered to the Grid by the given WTG for the given month (net export kWh) is then obtained by subtracting import from export. Thus,

$$b) \quad \text{Net Export} = \text{Export} - \text{Import} \quad (f)$$

These apportioned values viz., import, export and net export kWh can be referred from the Monthly Break up of net export units report.

Monitoring Plan at Maharashtra State

For Maharashtra Site – Following section includes –

- 1. Monitoring Methods and Procedures**
- 2. QA/QC procedures**
- c) **3. Data uncertainties and adjustments**

For WTG in the project activity, the MSEDCL would report net electricity exported and imported from the grid. The net electricity supplied to the grid would be reported as the difference between the net export and import from the WTG. The electricity export and import data will be monitored via main and check meters connected to feeders at the respective sub-station. Multiple WTGs would be connected to each feeder, one of which would be part of the project activity (WTGs owned by Rajasthan Gum Private Limited) and rest of which would not be part of the project activity (WTGs owned by other entities). MSEDCL follows an apportioning procedure to account for electricity generation from individual WTGs based on data from individual WTG controllers. The electricity exported and imported from the grid is recorded on a monthly basis, jointly in the presence of Investor representatives (O&M Contractors) and MSEDCL personnel. Following the joint meter readings, the O&M Contractors provide the readings of the WTG controller to MSEDCL. Based on the monthly export and import data as per main/check meters and the WTG controller readings, MSEDCL provides a break-up of the electricity exported and imported for each WTG.

The net electricity generation from each WTG is determined by MSEDCL as follows:

$$\text{Export from WTG} = \frac{\text{Generation at WTG controller}}{\text{Total generation at all WTG controllers for the feeder}} \times \text{Export from MSEDCL main/check meter}$$

$$\text{Import from WTG} = \frac{\text{Generation at WTG controller}}{\text{Total generation at all WTG controllers for the feeder}} \times \text{Import from MSEDCL main/check meter}$$

The above calculations would be carried out solely by MSEDCL and only the final apportioned electricity export, import, and net export for each WTG would be reported by MSEDCL in the Credit Notes. The details of the joint meter readings are not reported in the credit notes issued by MSEDCL.

A monthly joint meter reading of the energy meters would be carried out by MSEDCL officials and O&M contractors (representatives of the project promoter).

- d) **Procedures to deal with Data Uncertainty**

Main and check meters for the project activity are of at least 0.2 accuracy class. Accuracy tests will be carried out at least once every year to ensure that the meters are working within their accuracy class. In addition to this, on a monthly basis main meter and check meter readings would be noted by representatives of the project promoter. To check that both meters are working within their accuracy class, the electricity export measured by the main meter and the electricity export measured by the check meter would be compared. If the difference between the two values is greater than 0.2% (sum of accuracy class of the two meters), it would be established that one or both of the meters is giving erroneous readings. In such a scenario, MSEDCL would be notified and requested to check the accuracy of both the main and check meter. The erroneous meter(s) would be identified and calibrated or replaced. The following actions would be carried out for determination of emission reductions:

■ By default main meter readings are considered in the credit notes and for emission reduction calculations. If the main meter is found to be erroneous, the check meter readings would be used in the credit notes and for emission reduction calculations. The main meter would be calibrated or replaced with a new calibrated energy meter.

■ [REDACTED] considered. The check meter would be calibrated or replaced with a new calibrated energy meter.

■ If both meters are found to be erroneous, and then emission reductions will be adjusted in a conservative manner to account for the error percentage reported for the respective period. Both energy meters would be calibrated or replaced with new calibrated energy meters.

e) Difference between Accuracy Tests and Calibration

Accuracy tests will be conducted by MSEDCL personnel on the main and check energy meters at least once every year. The accuracy tests will be carried out using a standard portable meter to verify that the error percentage in the main and check meters is within the permissible limit. Calibration is conducted by MSEDCL personnel in case the error in the main or check meter is found to be beyond the permissible limit. In such a scenario, the erroneous meter may be replaced with a new calibrated energy meter.

f) Description of calibration of WTG Controller

The controller used for the WTGs which is an SCS Controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. It uses a Woodward Multi function Relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current / voltage is converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVAh, kVArh and kWh. These instantaneous values are then time integrated and displayed / stored. Woodward relay is having no display and

needs special protocol to view energy readings as this relay is communicating digital signal through special communication protocol. Moreover, turbine cannot run without this relay hence it cannot be removed for calibration, hence, it is not possible to calibrate.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{BL,y} \times EF_{grid,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{BL,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,y}$ = Combined margin CO₂ 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 CO₂/MWh). The emission factor is also abbreviated as $EF_{grid,CM,y}$ as per tool.

State	Net Electricity (MWh)	Grid Emission Factor (tCO ₂ /MWh)	Emission Reduction (tCO ₂)
Maharashtra	73,103.01	0.9582	70043
Rajasthan	52,094.84	0.9582	49913
Total	125,197	0.9582	119,956

*Calculation details are provided in excel worksheet

$$\begin{aligned}
 BE_y &= 125,197 \text{ MWh} * 0.9582 \text{ tCO}_2/\text{MWh} \\
 &= 119,956 \text{ tCO}_2
 \end{aligned}$$

5.2 Project Emissions

As per Applied methodology, project emission for this project activity is 0. $PE_y = 0$.

5.3 Leakage

As per applied methodology, leakage emission for this project activity is 0. $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y$$

BE_y = Baseline Emissions

PE_y = Project emissions

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$ER_y = 119956 - 0$$

$$= 119,956 \text{ tCO}_2\text{e}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2015 (From 05-January-2015)	20,445	0	0	20,445
2016	19,714	0	0	19,714
2017	19,677	0	0	19,677
2018	20,743	0	0	20,743
2019	21,357	0	0	21,357
2020	17,951	0	0	17,951
2021 (Till 04-January-2021)	69	0	0	69
Total	119,956	0	0	119,956 (Round down value)

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 149,675 tCO₂e, whereas actual emission reductions achieved are 119,956 tCO₂e, which is approximately 19.9% lower than the estimated emission reductions.

APPENDIX I: <CALIBRATION DETAILS>

Maharashtra

WTG ID	Main Meter	Check Meter	Accuaracy Class	Date of Calibration	Due Date of Calibration	Frequency
JTH-152	13813605	13813606	0.2	11-June-2014	10-June-2015	Annual
				05-July-2015	04-July-2016	
				03-August-2016	02-August-2017	
				08-August-2017	07-August-2018	
				18-August-2018	17-August-2019	
				29-August-2019	28-August-2020	
				20-August-2020	19-August-2021	
JTH-183	14953584	16268014		11-June-2014	10-June-2015	
				05-July-2015	04-July-2016	
				03-August-2016	02-August-2017	
				08-August-2017	07-August-2018	
				18-August-2018	17-August-2019	

				29-August-2019	28-August-2018	
				20-August-2020	19-August-2021	

WTG ID	Main Meter	Check Meter	Accuracy Class	Date of Calibration	Due Date of Calibration	Frequency
JTH-67	HT01150083	HT01150084	0.2	11-June-2014	10-June-2015	Annual
				05-July-2015	04-July-2016	
				17-July-2016	16-July-2017	
				02-August-2017	01-August-2018	
				08-August-2018	07-August-2019	
				29-August-2019	28-August-2020	
				26-August-2020	25-August-2021	
JTH-158	HT0115002			11-June-2014	10-June-2015	
				05-July-2015	04-July-2016	
				03-August-2016	02-August-2017	
				08-August-2017	07-August-2018	

01-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH152	Pitch ResolverEncoderDif f3Stop	U	1.8
01-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH158	Rep Pitch CANComFail	U	1.6
01-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH183	Mech SwitchTwistCW EndStop	U	2.2
01-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH67	Elec YawSensor ErrStop	U	0.4
02-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH152	Pitch ResolverEncoderDif f3Stop	U	4.5
02-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH158	Rep Pitch EmergencyRun	U	2.5
02-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH183	Elec YawSensor ErrStop	U	0.1
04-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH158	Rep Pitch CANComFail	U	5
05-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH183	Elec YawSensor ErrStop	U	0.1

05-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Elec YawSensor ErrStop	U	0.2
06-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Forcefull Stoppage	FM	13.7
07-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Forcefull Stoppage	FM	24
08-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Pitch Akku1Voltage LowStop	U	0.6
08-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Elec VoltageAsymmetry	U	0.1
08-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Forcefull Stoppage	FM	24
09-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Forcefull Stoppage	FM	14.9
10-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	FSS CANFail	U	2.6
12-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Rep Pitch EmergencyRun	U	2.4

13-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Rep Pitch EmergencyRun	U	6.7
16-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	YawNorthSensorNot Detected	U	0.6
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Shut Down Taken By OMS Team	GF	1.2
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Shut Down Taken By OMS Team	U	0.1
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Shut Down Taken By OMS Team	GF	1.2
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Shut Down Taken By OMS Team	U	0.1
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Line Breakdown due to Earthfault	GF	8
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Shut Down Taken By OMS Team	GF	0.9
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Shut Down Taken By OMS Team	U	0.4

17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Shut Down Taken By OMS Team	GF	1.2
17-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	VCB Tripped	U	1.4
18-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Grid Down from EB	GF	0.5
18-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Grid Down from EB	GF	0.5
18-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Preventive Check	S	1
18-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Grid Down from EB	GF	0.5
19-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Grid Down from EB	GF	0.1
19-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Mech SwitchTwistCW EndStop	U	3.4
21-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Elec VoltageAsymmetry	U	0.1

21-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Elec VoltageAsymmetry	U	0.1
21-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	WTG Preventive Maintenance	S	8
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Rep Pitch CANComFail	U	1
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Shut Down Taken By Projects Team	GF	2.7
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Rep Pitch CANComFail	U	1
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Shut Down Taken By Projects Team	GF	2.7
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Grid Down from EB	GF	0.3
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Preventive Check	S	0.6
23-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Shut Down Taken By Projects Team	GF	2.7

24-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	WTG Preventive Maintenance	S	7
25-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Rep Pitch CANComFail	U	0.3
26-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Rep Pitch CANComFail	U	0.2
26-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Preventive Check	U	2
26-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Rep Pitch CANComFail	U	3.8
27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	FSS Fault	U	0.4
27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Grid Down from EB	GF	1.2
27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	FSS Fault	U	0.3
27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH158	Grid Down from EB	GF	1.2

27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH67	FSS Fault	U	0.3
27-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH67	Grid Down from EB	GF	1.2
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH152	Shut Down Taken By OMS Team	U	0.4
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH152	Shut Down Taken By Projects Team	GF	4.4
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH152	VCB Tripped	U	0.8
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH158	Shut Down Taken By OMS Team	U	0.7
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH158	Shut Down Taken By Projects Team	GF	4.4
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH67	Shut Down Taken By OMS Team	U	0.3
28-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devga d	2.100	JTH67	Shut Down Taken By Projects Team	GF	4.4

29-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Elec YawSensor ErrStop	U	0.5
29-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Mech SwitchTwistCW EndStop	U	2.9
30-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Preventive Check	U	0.8
30-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH152	Rep Pitch CANComFail	U	1
31-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Shut Down Taken By OMS Team	GF	3.6
31-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH183	Shut Down Taken By OMS Team	U	0.1
31-Jan-2015	Maharashtra	Jath	Jath-Nalco-Devgad	2.100	JTH67	Rep Pitch CANComFail	U	2.7

Gen Date.	State	Site	Section	MW	Loc. No.	Breakdown Remark	Formula Parameter	Breakdown Hrs.
01-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Grid Down from EB	GF	0.7

01-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Grid Down from EB	GF	0.7
01-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku2Voltage LowStop	U	1
01-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Grid Down from EB	GF	0.7
04-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	UPS Tripped	U	1.1
09-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Preventive Check	U	1.6
10-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Grid Down from EB	GF	0.7
10-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Grid Down from EB	GF	0.7
10-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Grid Down from EB	GF	0.7
15-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Grid Down from EB	GF	1.7
15-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Grid Down from EB	GF	1.7
15-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Grid Down from EB	GF	1.7
15-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	UPS Tripped	U	4.1
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Grid Down from EB	GF	4.9
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	SFS DCLinkVoltage UDC Trip Stop	U	3.3

16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Elec UPSBattChange	U	0.7
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Grid Down from EB	GF	4.9
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku1Voltage LowStop	U	16.8
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Grid Down from EB	GF	4.9
16-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	UPS Tripped	U	3
17-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku1Voltage LowStop	U	24
18-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Pitch Akku2Voltage LowStop	U	9
18-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku1Voltage LowStop	U	24
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Pitch Akku2Voltage LowStop	U	2.1
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Shut Down Taken By OMS Team	U	0.3
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Shut Down Taken By OMS Team	U	2.1
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku2Voltage LowStop	U	6.9

19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku2Voltage LowStop	U	15
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Shut Down Taken By OMS Team	U	2.1
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Shut Down Taken By OMS Team	U	1
19-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Shut Down Taken By OMS Team	U	2.1
20-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku2Voltage LowStop	U	22.4
22-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Emergency Run	U	0.1
23-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Pitch Akku3Voltage LowStop	U	2
28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Grid Down from EB	GF	0.4
28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Pitch Akku2Voltage LowStop	U	15.7
28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Grid Down from EB	GF	0.4
28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD086	Pitch Akku1Voltage LowStop	U	1.7
28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Elec VoltageU1 LowStop	U	0.1

28-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD089	Grid Down from EB	GF	0.4
29-Jan-2015	Rajasthan	Mokala	Kaladongar	2.100	KD084	Pitch Akku1Voltage LowStop	U	1.5