



*Voluntary Carbon Standard 2007.1*

## **VERIFICATION REPORT**

# **15 MW bundled grid connected renewable energy project in Maharashtra, India**

**VERIFICATION PERIOD:  
1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009**

**Project No/ Rev. No.: V-3-I-01-B-0087-Ve/01**

## Verification Report

<b>Name of Verification company:</b>	<b>Date of issue:</b>
Perry Johnson Registrars CDM Inc.	2010-11-23
<b>Report Title:</b>	<b>Approved by:</b>
Verification report – “15 MW bundled grid connected renewable energy project in Maharashtra, India”	Anjana Sharma
<b>Client:</b>	<b>Project Title:</b>
M/s C Mahendra Exports Limited M/s Ratnakala Exports M/s Ambika Diamonds M/s Rindiam Export	Monitoring report of “15 MW bundled grid connected renewable energy project in Maharashtra, India” Version : 03 Date : 2010-09-21
<b>Summary:</b>	
<p>M/s C Mahendra Exports Limited, the focal point for the project along with the other developers have contracted with Perry Johnson Registrars Clean Development Mechanism Inc.(PJRCMD) for verification of the project – “15 MW bundled grid connected renewable energy project in Maharashtra, India” under Voluntary Carbon Standard (VCS). The verification involves independent review of the implementation of project as per VCS project document (PD) and its monitoring plan.</p> <p>The project activity consists of twelve(12) numbers, M/s Suzlon Energy Ltd (S-70 Model) WTGs of installed capacity 1.25 MW each (1.25 MWx12 = 15 MW) in the Dhule and Sangli districts of Maharashtra state in India. Based on the assessment of the GHG emission reductions reported in the initial version of the monitoring report version 01 dated 14<sup>th</sup> December 2009, PJRCMD had requested responses from the project proponent through the means of Clarification Requests (CLs), Corrective Action Requests (CARs) and Forward Action Requests (FARs) issued in the draft verification report.</p> <p>In our opinion, the GHG emission reductions reported in the monitoring report final version 03, dated 21<sup>st</sup> September 2010 are fairly stated. Based on the assessment, PJRCMD is able to certify that the implementation of the project has resulted in GHG emission reduction of <b>72,662</b> tCO<sub>2</sub> equivalent during the period 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009.</p> <p>PJRCMD’s opinion regarding the reported emission reductions for the given monitoring period, is based on the information sought and also reviews of publicly available information where applicable. ISO-14064 guidelines have been applied in principle to assess the key issues like accuracy, completeness and conservativeness of the information. PJRCMD’s verification/certification of GHG emissions is limited to this information evaluation.</p> <p>Issuance and utilization of certified GHG-emission reductions is beyond the scope of PJRCMD.</p>	
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<b>Work carried out by:</b>	<b>Work Reviewed by:</b>
Ajay Verma	Anjana Sharma



***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
GHG	Greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
KWh	Kilo Watt hour
PD	Project Document
PJRCDM	Perry Johnson Registrars Clean Development Mechanism Inc.
PP	Project Proponent
MSEDCL	Maharashtra State Electricity Distribution Company Limited
NEWNE	North East West Northeast Grid
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
CMEL	C Mahendra Exports Limited



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## **1 INTRODUCTION**

M/s C Mahendra Exports Limited (CMEL), hereinafter referred to as the “client” or “project proponent”, contracted Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform the validation and verification of the project activity “*15 MW bundled grid connected renewable energy project in Maharashtra, India*” under the Voluntary Carbon Standard (VCS) 2007.1 for the period 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009. The report describes the verification work undertaken. The validation of the project activity against the VCS 2007.1 requirements was completed on 18<sup>th</sup> November 2009.

### **1.1 Objective**

Verification under VCS is the independent ex-post quantification and certification of the greenhouse gas (GHG) emission reductions achieved by a project activity which has completed validation under VCS 2007.1 or registered under a VCS approved GHG program.

The above work is carried out through an independent assessment and a written assurance is provided on the GHG emission reductions achieved for the period specified.

### **1.2 Scope and Criteria**

The scope of the verification covers independent objective review and ex-post determination of the monitored GHG emission reductions by the project activity “*15 MW bundled grid connected renewable energy project in Maharashtra, India*”.

The specific scope of the verification work involves:

- To verify that the project activity is implemented as per the project details of the registered project design document (PDD) or the VCS PD
- To assess whether the emissions reductions determined are in conformance with the monitoring plan of the VCS PD and the approved methodology.
- To express a conclusion whether reported data are accurate, complete, consistent, and transparent with a reasonable level of assurance and free of omission or material error, based on the review of the reported data and emission reduction calculations.

The project is assessed against the verification requirements of VCS 2007.1 standard including the criteria that the emission reductions are real, measurable, transparent and conservative. The approach adopted by PJRCDM verification team is risk-based, drawing on an understanding of the risks associated with reporting of GHG emissions data and the controls in place to mitigate these.

The work carried out by PJRCDM is free from any conflict of interest.

Request for issuance of Voluntary Carbon Units (VCUs), verified and certified by PJRCDM, shall be made by the project proponent to the VCS registry in accordance with the most recent version of the “*VCS Guidance Document: VCS Project Registration and VCU Issuance process*”. In view of the above, PJRCDM’s

responsibility is limited only to verification and certification of the GHG emission reductions achieved during the specified period.

### 1.3 VCS project Description

The project activity is generation of electricity by wind turbine generators and export to the regional grid (NEWNE) through Maharashtra State Electricity Distribution Company Limited (MSEDCL). The project activity comprises of twelve (12) WTGs owned by M/s C Mahendra Exports Limited , M/s Ratnakala Exports , M/s Ambika Diamonds and M/s Rindiam Export. All among them, M/s C Mahendra Exports Limited is the focal point for project developers. The Project activity has been installed in villages Tisangi, Ghtnandre, Jarandi and Titane in Sangli and Dhule districts of Maharashtra.

The WTGs are S-70 (1.25 MW ) models by M/s Suzlon Energy Ltd

Project owner	: M/s C Mahendra Exports Limited
Location	: Villages of Tisangi, Ghtnandre, Jarandi and Titane in Sangli and Dhule districts of Maharashtra, India.
Title of the PDD	: <i>15 MW bundled grid connected renewable energy project in Maharashtra, India</i>
Methodology used	: AMS I D, version 14
VCS Crediting period	: 1 <sup>st</sup> April 2006 to 31 <sup>st</sup> March 2016
Monitoring period under VCS	: 1 <sup>st</sup> April 2006 to 1 <sup>st</sup> October 2009

**Table 1: Project Details**

S.No.	WEG Number	Date of Commissioning	Village	Taluka	Latitude	Longitude
1	G – 320	31-Mar-2006	Tisangi	Kawathe Mahakal	N 17 09 23.7	E 74 50 51.8
2	G – 52	25-Mar-2006	Ghatnandre	Kawathe Mahakal	N 17 11 40.6	E 74 51 11.5
3	G – 53	25-Mar-2006	Ghatnandre	Kawathe Mahakal	N 17 11 58.2	E 74 51 24.3
4	G – 54	25-Mar-2006	Ghatnandre	Kawathe Mahakal	N 17 12 23.5	E 74 51 44.7
5	G – 55	20-Feb-2006	Ghatnandre	Kawathe Mahakal	N 17 12 20.0	E 74 52 12.0
6	G – 56	20-Feb-2006	Ghatnandre	Kawathe Mahakal	N 17 12 33.2	E 74 52 07.5
7	G – 57	25-Mar-2006	Ghatnandre	Kawathe	N 17 12 36.0	E 74 51 49.3

				Mahakal		
8	G – 38	14-Feb-2006	Ghatnandre	Kawathe Mahakal	N 17 11 31.7	E 74 53 16.3
9	G – 311	20-Feb-2006	Jarandi	Tasgaon	N 17 09 52.2	E 74 50 05.4
10	G – 319	31-Mar-2006	Tisangi	Kawathe Mahakal	N 17 09 50.5	E 74 50 33.9
11	K – 139	11-Jul-2005	Titane	Sakri	N 21 12 05.1	E 74 18 29.9
12	K – 123	01-Sep-2005	Titane	Sakri	N 21 11 32.7	E 74 17 39.2

## 1.4 Level of assurance

In line with VCS 2007.1 requirements and as per ISO 14064-3:2006 paragraph A.2.3.2, a “*reasonable level of assurance*” is defined for the verification of the project.

This implies that, based on the process and procedures conducted, PJRCDM confirms that the GHG assertion in the monitoring report

- is materially correct and is a fair representation of the GHG data and information, and
- is prepared in accordance with VCS requirements, the registered CDM PDD and the approved methodology for information pertaining to GHG quantification, monitoring and reporting.

The verification work is carried out as per this requirement and details are presented in the Verification statement in section 2 below.

## 2 METHODOLOGY

### 2.1 General Approach

The project activity applies approved baseline and monitoring methodology AMS-I.D (version 14) categorised under sectoral scope 01 ‘Energy industries (renewable - / non-renewable sources)’. For verification of emission reductions, PJRCDM’s approach involves broadly three steps:

- 1) Completeness check and desktop review of the monitoring report
- 2) Onsite inspection and issuance of findings from the audit
- 3) Resolution of the findings and preparation of the verification report

The following team members from PJRCDM were involved in these steps :

Name	Role	Areas covered
Ajay Verma	GHG Auditor/Project Manager	Completeness check of monitoring report, desktop review, issuance and closure of findings, final verification report preparation



Name	Role	Areas covered
T Krishna	GHG Auditor	Desk review and site visit
Anjana Sharma	Technical review	Independent review of the verification assignment.

## 2.2 Means of Verification

### 2.2.1 Review of Project Documentation

On receipt of the monitoring report from the client, the completeness of information made available as per VCS2007.1 standard requirements was reviewed. A desktop review was further carried out to assess the following:

- the validated VCS PD with the monitoring plan
- the emission reduction calculation method used in the applied methodology and the VCS PD
- the monitoring report, including frequency of monitoring and the calculation of emission reductions for the period
- the documented operation and maintenance manual furnished by the project participant (where applicable)
- other external documents like grid emission factor, IPCC emission factor, etc. applied.

A complete list of all documents reviewed is attached in Appendix I of this report.

### 2.2.2 Onsite Inspections

An onsite visit was carried out by PJRCDM on 9<sup>th</sup> October 2009.

List of personnel interviewed and issues discussed during the site visit is as provided below:

**Table 2: Personnel Interviewed**

Name / Designation / Company	Interviewed on
Mr. Sudanand Patil Site Incharge Suzlon Energy Limited	<ul style="list-style-type: none"> <li>▪ Determination of net electricity generation</li> <li>▪ Joint meter reading exercises</li> <li>▪ Monitoring system</li> <li>▪ Invoices for electricity export</li> <li>▪ Calibration practice</li> </ul>
Mr. Mandar Executive C Mahendra Exports Ltd	
Ms. Lovleen Gupta Pricewater House Coopers	



During the site visit, PJRCDM verified the actual operation of the project as described in the PD. The system of controller energy meters and joint energy meters used for monitoring the sale of electricity to grid were examined. The monthly records for joint meter readings were reviewed.

### 2.2.3 Review of Monitoring Results and Correct Application of Monitoring Methodology

Based on the site inspection and review of records including the monitoring plan, a list of non conformities; Corrective Action Requests (CAR) were raised. The non conformities could be related to lack of adherence to the VCS 2007.1 requirement, non-conformance to the monitoring plan of as defined in the VCS registered PD or where evidence provided is found insufficient to prove conformity. They could also be mistakes in applying data/ assumptions and in calculation of emission reductions.

If information made available is insufficient to transparently arrive at the stated conclusion, a Clarification request (CL) is raised and communicated to the project proponent.

Observations may also be raised which are for the benefit of future verification period. These, however, have no impact upon the completion of the current verification activity.

On receipt of response from the project developer, the adequacy with compliance with VCS requirements is checked along with a revised monitoring report. Closure of comments raised occurs only if the response provided and correction made fully complies with the stated requirements of the methodology applied.

The list of CARs/ CLs raised and the response provided and reasons for closure are provided Appendix-1.

### 2.2.4 Determinations of the reductions in GHG Emissions

As per the applicable methodology, the emission reductions achievable by the project activity are calculated as a difference of baseline emissions ( $BE_y$ ) project emissions ( $PE_y$ ) and emissions due to leakage ( $L_y$ ) determined as follows.

**Baseline emissions:** The baseline emissions are determined as a multiple of net electricity generated and supplied to the grid by the renewable energy technology ( $EG_y$  in MWh), and an electricity grid emission factor calculated as per CDM EB guidance.

As per the VCS registered PD, the emission factor has been fixed *ex-ante*. For the current verification period, PJRCDM was able to verify the VER calculations based on the grid emission factor of 0.90617 tCO<sub>2</sub>/MWh.

**Project emissions:** As per methodology, there are no project emissions applicable and hence they have been considered as zero.

**Leakage:** No leakage has to be considered for the proposed project activity.

**Emission reductions:**  $ER_y = BE_y - PE_y - L_y = BE_y$

During the current monitoring period, i.e. from 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009, the project activity has delivered **80185.84** MWh of net electricity to the grid. PJRCDM team was able to verify the generation data presented in the excel

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worksheets, which were further cross checked against the JMR sheets and invoices. The invoices serve as a credible source for cross verification, since the same is used for the payment by the MSDCEL to project proponent. Based on this, the net reduction in GHG emissions achieved by the project activity during the said monitoring period is equivalent to **72,662 tCO<sub>2</sub>e**.

The above value of GHG emission reductions is based on completely monitored data, transparently presented, accurately measured and calculated, conservatively estimated and independently verified by PJRCDM.

### 2.2.5 Review of Additional Data from other Sources if appropriate

The validation report of the VCS project issued by PJRCDM, dated 18<sup>th</sup> November 2009, the VCS validated PD, version 03 dated 3<sup>rd</sup> November 2009 were reviewed for any pending issues to be considered during verification.

The other source of information was the CEA Database Version 04, available from the website, from which the emission factor for the grid was determined.

### 2.3 Internal Quality Control

On completion of the assessment by the GHG assessment team, the complete verification package including the verification report, monitoring report and supporting documents is sent to the Technical Reviewer. In this stage, the Technical Reviewer independently assesses the project with the VCS requirements before accepting/ rejecting the recommendation from the GHG assessment team.

## 3 VERIFICATION FINDINGS

### 3.1 Remaining issues, including any material discrepancy, from previous validation

No pending issues were identified from the discussion, findings and conclusions drawn from the current VCS Validation Report (version 01) issued by PJRCDM dated 18<sup>th</sup> November 2009.

### 3.2 Project Implementation

The project activity involves the installation and operation of twelve (12) Wind Turbine Generators (WTGs) in the villages Tisangi, Ghtnandre, Jarandi and Titane in Sangli and Dhule districts of Maharashtra, India by the clients. These WTGs are all manufactured by M/s Suzlon Energy Ltd. and are of 1.25 MW capacity.

The implementation of the project activity was as described in the VCS validated PD, checked against supportive documents presented. PJRCDM was able to verify that there was no change in project design compared to the design presented in the VCS validated PD, version 03 dated 3<sup>rd</sup> November 2009.

### 3.3 Completeness of Monitoring

The GHG emission reductions are calculated based on the net electricity exported by the project activity to the grid. This is measured by the 0.5% accuracy class tri-vector meters (energy meters) located at different sub-station. The main meter readings are the primary source while the check meter is used to determine the accuracy of meter

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readings, and the check meter readings would be used in the eventuality of main meter failing, if and when identified during yearly checks.

The JMR sheets of all the monthly readings for all the WTGs were checked and it has recorded in presence of MSEDCL representative and PP..

Complete data of electricity supply to the grid was available for the entire verification period (1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009) which was verified by PJRCMD.

**3.4 Accuracy of Emission Reduction Calculations**

PJRCMD assessed the different areas (as mentioned below) which can affect the accuracy of the final emission reduction calculations:

Net electricity supplied to the grid: The energy meter readings are noted monthly and these records are archived to cross-check yearly figures. Monthly joint meter reading is taken jointly by the MSEDCL and PP. At the conclusion of each meter reading, an appointed representative of the MSEDCL and the PP sign a document indicating the number of Kilowatt-hours indicated by the meter.

Metering accuracy: The calibration of the meters is carried out every once a year. The portable standard meter is owned by the MSEDCL at its own cost and tested and certified from an accepted laboratory standard meter in accordance with electricity board standards. The meters are deemed to be working satisfactorily if the errors are within specifications i.e.  $\pm 0.5$ . It was noticed that the calibration for the meters, which was not available as per validated monitoring plan. However, the project proponent has applied a correction factor in line with the guideline from the EB (EB 52, Annex 60) as higher of the errors between calibration report and maximum applicable to the accuracy class of the meter. The correction period has been reviewed by PJRCMD as per below table and was deemed to be correct and conservative in line with the guideline from EB.

As per requirement for monitoring plan of registered VCS PD. PP has provided latest calibration as can be seen from the table below:

S.No	WEG Number (s)	Name of Investor	Feeder Name	Period for which the WEG was connected to the respective feeder	Main Meter Number	Check Meter Number	Months for which the test reports are available	Period for which correction applied as per Annex 60, EB 52
1	G-320	C. Mahendra Exports Ltd.	Savlaj Feeder	April 2006 to June 2006	04725819	04725818	14th July 2006	April 2006 to June 2006
			Ghatnandre Feeder No. 4	July 2006 to September 2006	04738054	04738048	23rd August 2006, 22nd June 2007	July 2006 to August 2006

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S.No	WEG Number (s)	Name of Investor	Feeder Name	Period for which the WEG was connected to the respective feeder	Main Meter Number	Check Meter Number	Months for which the test reports are available	Period for which correction applied as per Annex 60, EB 52
			Ghatnandre Feeder No. 3	October 2006 to September 2009	04738049	04738050	23rd Aug. 2006, 21st June 2007, 20th Sep. 07, 12th Dec. 07, 12th Mar 08, 1st Dec. 08, 25th May 2010	--
2	G - 52, G - 53, G - 54, G - 55, G - 56, G - 57,	C. Mahendra Exports Ltd.	Savlaj Feeder	April 2006 to June 2006	04725819	04725818	14th July 2006	April 2006 to June 2006
			Ghatnandre Feeder No. 3	July 2006 to September 2006	04738049	04738050	23rd Aug. 2006, 21st June 2007	July 2006 to August 2006
			Ghatnandre Feeder No. 7	October 2006 to September 2009	04725701 / 04725801 / 04902214	04725785 / 04738055 / 04902212	16th Dec. 2006, 26th June 2007, 29th Sep. 2007, 12th Dec. 2007, 12th March 2008, 5th July 2008, 1st Dec. 2008	Oct. 2006 to June 2007
3	G - 38	C. Mahendra Exports Ltd.	Savlaj Feeder	April 2006 to June 2006	04725819	04725818	14th July 2006	April 2006 to June 2006
			Ghatnandre Feeder II	July 2006 to September 2006	04738052	04738053	23rd Aug. 2006, 21st June 2007	July 2006 to August 2006
			Ghatnandre Feeder No. 6	October 2006 to September 2009	04725802	04725800	21st June 2007, 29th Sep. 2007, 27th Dec. 2007, 5th July 2008, 1st Dec 2008	Oct. 2006 to June 2007

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S.No	WEG Number (s)	Name of Investor	Feeder Name	Period for which the WEG was connected to the respective feeder	Main Meter Number	Check Meter Number	Months for which the test reports are available	Period for which correction applied as per Annex 60, EB 52
4	G 311	Ratnakal a Exports	Savlaj Feeder	April 2006 to June 2006	04725819	04725818	14th July 2006	April 2006 to June 2006
			Ghatnandre Feeder No. 4	July 2006 to September 2006	04738054	04738048	23rd August 2006, 22nd June 2007	July 2006 to August 2006
			Ghatnandre Feeder No. 3	October 2006 to September 2009	04738049	04738050	June 2007, Sep. 07, Dec. 07, Mar 08, June 08, Sep. 08, Dec. 08, May 2010	Oct. 2006 to June 2007
5	G 319	Ratnakal a Exports	Savlaj Feeder	April 2006 to June 2006	04725819	04725818	14th July 2006	April 2006 to June 2006
			Ghatnandre Feeder No. 1	July 2006 to September 2009	04738051	04738047	29th July 2006, 28th December 2006, 12th Dec. 2007, 25th Nov. 2008	Jul-06
6	K 139	Ambika Diamonds	Jamde 12	April 2006 to June 2009	04725806	04725809	28th March 2006, 8th Oct. 2007, 27th May 2008	March 2007 to Oct. 2007 May 2009 to June 2009
			Jamde 15	July 2009 to September 2009	04725784	04738059	27th May 2008, 20 <sup>th</sup> August 2010	July 2009 to Sep. 2009
7	K 123	Rindiam Export	Jamde 12	April 2006 to June 2009	04725806	04725809	28th March 2006, 8th Oct. 2007, 27th May 2008	March 2007 to Oct. 2007

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S.No	WEG Number (s)	Name of Investor	Feeder Name	Period for which the WEG was connected to the respective feeder	Main Meter Number	Check Meter Number	Months for which the reports are available	Period for which correction applied as per Annex 60, EB 52
							2008	May 2009 to June 2009
			Jamde 15	July 2009 to September 2009	04725784	04738059	27th May 2008, 20 <sup>th</sup> August 2010	July 2009 to Sep. 2009

Value of grid emission factor: PJRCM was able to confirm that this parameter was fixed *ex-ante* during the validation of the project (Validation Report Version 01 dated 18<sup>th</sup> November 2009 and VCS validated PD Version 03 dated 3<sup>rd</sup> November 2009) and the same was used for ER calculations for the current monitoring period. Even during validation, the parameter was derived from officially published latest database<sup>1</sup> from Central Electricity Authority of India, a subsidiary of Ministry of Power, Government of India, which is the authentic source of such information.

The emission factor for the North East West North East regional grid to which the project activity exports power to is determined as 0.90617 tCO<sub>2</sub>/MWh.

### 3.5 Quality of Evidence to Determine Emission Reductions

The source of net energy generation, as reported in the validated PD, is the JMR sheets, and the same were used by the client to calculate the EG<sub>y</sub>. PJRCM was able to check and verify the values. The annual value of the energy exported was the summation of these monthly readings. The JMR sheets are deemed to be the most appropriate source of data for net energy exported, as the values denoted were jointly measured by the representatives of the PP and a Government representative (MSEDCL/EB official), duly signed and acknowledged by both parties.

The emission factor for the North East West Northeast (NEWNE) regional grid to which the project activity exports power to is determined as 0.90617 tCO<sub>2</sub>/MWh, a value fixed *ex-ante* during validation of the project activity and sourced from the official source for grid emission factors in India.

These practices meet the requirements of the applied methodology and approved monitoring plan as registered in the VCS PD.

PJRCM was able to verify that the calculations are based on the authentic data from the joint meter reading sheets issued by the Maharashtra State Electricity Distribution

<sup>1</sup> <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

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Company Limited. The excel sheet used to calculate the monthly emission reduction figure were all tracked, checked and found to be consistent. Some errors were found in data transfer which were communicated to the project developer and the excel sheet was corrected accordingly

### **3.6 Management and Operational System**

The clients have established and implemented procedures to monitor the project activity and it's operation as per the registered PD. These procedures cover management responsibilities, data monitoring and reviewing procedures and have provided with reports.

All monthly records are archived in electronic copy and paper format.

#### 4 VERIFICATION CONCLUSION AND CERTIFICATION STATEMENT

*Perry Johnson Registrars CDM Inc. (PJRCDM) has carried out verification of the emission reductions achieved by the project “15 MW bundled grid connected renewable energy project in Maharashtra, India” against the guidelines of VCS 2007.1. The project activity is generation of electricity by twelve (12) Wind Turbine Generators (WTGs) of 1.25MW capacities installed in villages Tisangi, Ghatnandre, Jarandi and Titane in Sangli and Dhule districts of Maharashtra, India.*

*Verification was sought for the emission reductions achieved by the project within the period 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009. The project has applied the version 14 of the small scale CDM methodology AMS-I.D “Grid connected renewable electricity generation” and the emission reductions are as reported in the version 03 of the monitoring report, dated 21<sup>st</sup> September 2010.*

*PJRCDM’s approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. The assessment was based on review of supporting evidences and information provided, including other explanations where necessary to enable PJRCDM to provide **reasonable assurance** that the reported amount of GHG emission reductions for the specified period is materially correct and fairly stated.*

#### Certification statement:

*PJRCDM confirms that the project activity has been implemented as per the VCS registered PD and that the emission reductions presented in the monitoring report version 03 dated 21<sup>st</sup> September 2010, are correctly determined as per the VCS2007.1 standard and AMS-I.D methodology, version 14. Based on the above information, PJRCDM confirms the following:*

<i>Name of the project</i>	<i>“15 MW bundled grid connected renewable energy project in Maharashtra, India”</i>
<i>VCS PD</i>	<i>Version 03 dated 3<sup>rd</sup> November 2009</i>
<i>Methodology</i>	<i>AMS-I.D Version 14</i>
<i>Monitoring Report</i>	<i>Version 03 dated 21<sup>st</sup> September 2010</i>
<i>Reporting period</i>	<i>1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009</i>

*Verified emission in the above reporting period:*

<i>Project emissions</i>	<i>:</i>	<i>0</i>	<i>tCO<sub>2</sub> equivalents</i>
<i>Baseline emissions</i>	<i>:</i>	<i>72662</i>	<i>tCO<sub>2</sub> equivalents</i>
<i>Emission reductions</i>	<i>:</i>	<i>72662</i>	<i>tCO<sub>2</sub> equivalents</i>



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**Total Year-Wise emission reductions:**

<i>Period</i>	<i>Emission Reductions(tCO2e)</i>
<i>1<sup>st</sup> April 2006- 31<sup>st</sup> December 2006</i>	17,409
<i>1<sup>st</sup> January 2007 – 31<sup>st</sup> December 2007</i>	18,870
<i>1<sup>st</sup> January 2008 – 31<sup>st</sup> December 2008</i>	15,586
<i>1<sup>st</sup> January 2009 – 1<sup>st</sup> October 2009</i>	20,797
<i>1<sup>st</sup> April 2006– 1<sup>st</sup> October 2009</i>	<b>72,662</b>

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## ***APPENDIX I: DOCUMENTS REVIEWED***

- /1/ Monitoring Report: “15 MW bundled grid connected renewable energy project in Maharashtra, India” version 03, dated 21<sup>st</sup> September 2010 and the previous versions.
- /2/ Final validated Project Design: “15 MW bundled grid connected renewable energy project in Maharashtra, India” Version 03 dated 3<sup>rd</sup> November 2009.
- /3/ VCS Validation Report – “15 MW bundled grid connected renewable energy project in Maharashtra, India” Version 01 dated 18<sup>th</sup> November 2009
- /4/ Approved Small-scale Methodology – Indicative baseline and monitoring methodology AMS ID, version 14: “Grid connected renewable electricity generation”
- /5/ CDM Executive Board: Validation and Verification Manual, version 01.1
- /6/ Emission reduction excel worksheet, ‘Verification Excel Sheet.xls’
- /7/ Calibration Certificates for WTGs Number G-320, G-52,G-53, G-54, G-55, G-56,G-57, G-38,G-311,G\_319 ,K-139 and K-123 form 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009.
- /8/ Joint meter Reading for each WTGs Number G-320, G-52,G-53, G-54, G-55, G-56,G-57, G-38,G-311,G\_319 ,K-139 and K-123 for electricity generation data for the period – 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009.
- /9/ Invoice for each WTGs Number G-320, G-52,G-53, G-54, G-55, G-56,G-57, G-38,G-311,G\_319 ,K-139 and K-123 for electricity generation data for the period – 1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009.



APPENDIX II : RESOLUTION OF CARs AND CLs

Draft report clarification requests and corrective action requests by verification team	Ref. To the section of the monitoring report	Summary of project owner response	Verification team conclusion
<p><b>CAR 1:</b> As required by the monitoring plan in the VCS PD, please include the generation details at the controller end for each WTG in the excel sheet.</p>	<p>3.2</p>	<p>The generation details at the controller end for each WEG is being provided in the excel sheet format.</p>	<p>PJTRCDM has reviewed the generation details at controller end for all WTGs</p> <p>This CAR-1 is closed.</p>
<p><b>CAR 2:</b> The calibration frequency for the meters is stated to be annual. However, currently only the test certificates (quarterly) have been submitted to PJRCDM. Please provide the annual calibration certificates for all the meters included in the project activity.</p> <p>Meter test certificates have been provided for main and check meter at feeder 7 only (for year 2006, 2007 and 2008). Please provide the calibration certificates for main and check meter at other feeders also i.e. Ghatnandre feeder 6, Ghatnandre feeder 3, Suthari feeder 12 and Suthari 11.</p> <p>It has also been observed that meter test certificate has not been provided for the year 2009 for main and check meter located at all the above mentioned feeders. Please provide the</p>		<p>The calibration is only carried out when the meters during the tests are found to be working outside the limits. Since, during the tests, the meters have been found to be working within the limits, no calibration has been carried out.</p> <p>The testing certificates are being submitted.</p> <p>The details of test reports along with the PP name, WEG number, meter number has been added in the monitoring report and the VER calculation sheet.</p> <p>Additionally, correction has been applied to the import and export readings as per EB 52, Annex 60 (EB</p>	<p>PJRCDM has reviewed all the testing certificates for all WTGs and details of calibration/test reports has been added in monitoring report. It is found to be Ok.</p> <p>This CAR-2 is closed.</p>

**VCS VERIFICATION REPORT**



Draft report clarification requests and corrective action requests by verification team	Ref. To the section of the monitoring report	Summary of project owner response	Verification team conclusion
same.		<p>52, Annex 60 clarifies that in case the calibration is not carried out according to the monitoring plan, the maximum of the errors; maximum permissible error and error identified in the recent meter testing, should be applied. As the most recent meter testing doesn't indicate any error beyond permissible error, we have applied the maximum permissible error of the meters (0.5% for all WEGs). We have deducted the export by 0.5% and increased the import by 0.5%) for the period for which the testing certificates were not available.</p> <p>The revised VER calculation sheet along with the monitoring report is being submitted to DOE.</p>	
<p><b>CAR 3:</b> Errors have been found in data transfer from invoices to excel sheet e.g. for the month of December 2007, for WTG G55 and G56, import, export and net generation figure is not matching with the document (invoices) provided for the same. Please check and correct the same. PJRCDM requests PP to check the excel sheet thoroughly and correct (if any) all such errors.</p>		<p>The discrepancy has been corrected in the revised VER calculation sheet being submitted to DOE.</p> <ol style="list-style-type: none"> <li>1. The scanned copies for the WEGs mentioned are attached herewith.</li> </ol>	<ol style="list-style-type: none"> <li>1. PJRCDM has reviewed the revised MR and ER sheet and provided scan copies of July-2009 to Oct-2009 Credit report for C Mahendra. It is found to be Ok.</li> <li>2. The revised import reading of G-320 month June-2009 has been</li> </ol>

**VCS VERIFICATION REPORT**



Draft report clarification requests and corrective action requests by verification team	Ref. To the section of the monitoring report	Summary of project owner response	Verification team conclusion
		2. The import figure of WEG G-320 for the month of June 2009 has been corrected to 217.7 in the revised monitoring report and VER calculation sheet.	revised and found to be OK.  This CAR-3 is closed.
<p><b>CAR 4:</b> It has also been observed that for WTG G-38, the generation data (import - 236997.4 kWh, export- 14391.8 k Wh, net-222605 kWh) for the period from January 2008 to May 2008 has been provided in the invoice for the month of May 2008. However in the excel sheet, this has been stated twice i.e. in the month of January 2008 as well as in the month of May 2008 which has resulted in double counting. Please check and correct the same. PJRCDM requests PP to check the excel sheet thoroughly and correct (if any) all such errors.</p>		<p>The discrepancy has been corrected in the revised VER calculation sheet being submitted to DOE. The VER changes have also been incorporated in the revised Monitoring Report being submitted to DOE.</p> <ol style="list-style-type: none"> <li>1. The JMR document for WEG G-38 for the month of November 2007 is attached herewith.</li> <li>2. For WEGs K-134 and K-123, for the month of March 2006, it is clearly stated in the JMRs that the reading has been taken from 28-Feb-06 to 31-Mar-06. The scanned copy of JMRs is attached herewith.</li> </ol>	<p>PJRCDM has reviewed changes and provided documents and identified following:</p> <ol style="list-style-type: none"> <li>1. PP has provided the WTG G-38 month of November 2007 JMR document and it is found to be Ok.</li> <li>2. PP has provided WTGs K-134 &amp; K-123 generation data and it has been taken from 1<sup>st</sup> April 2006. So it is found to be Ok.</li> </ol> <p>This CAR-4 is closed.</p>

**VCS VERIFICATION REPORT**



Draft report clarification requests and corrective action requests by verification team	Ref. To the section of the monitoring report	Summary of project owner response	Verification team conclusion
<p><b>CL-1</b></p> <p>PP is requested to include a discussion in the monitoring report regarding the difference between the estimated yearly emission reduction figure (as stated in the validated VCS PD) and the actual emission reductions resulting from the project activity (as stated in the monitoring report). Reasons for the same needs to be clearly stated in the monitoring report.</p>		<p>The discussion regarding the difference between the estimated emission reduction and actual emission reduction has already been included in section 4.2 of the monitoring report.</p>	<p>PJRCDM has reviewed the revised MR and it is found to be OK.</p> <p>This CL-1 is closed.</p>

### APPENDIX III: LIST OF PARAMETERS

List of parameters covered during the verification period under consideration (1<sup>st</sup> April 2006 to 1<sup>st</sup> October 2009) and details regarding the monitoring and reporting practices.

S.No.	Monitoring and reporting practice/Parameter	Parameter 1
1.	Monitoring and reporting frequency as verified during the site visit.	<i>The monthly meter reading is taken jointly by the Maharashtra State Electricity Distribution Company Limited and PP. At the conclusion of each meter reading an appointed representative of the Maharashtra State Electricity Distribution Company Limited (MSEDCL) and the PP sign a document indicating the number of Kilowatt-hours indicated by the meter.</i>
2.	Monitoring equipment verified during the site visit.	<i>Energy meter Accuracy of main and check meter: 0.5 class</i>
3	Calibration frequency and other details verified during the site visit.	<i>Once in a year. The calibration activity is in the control of the MSEDCL. The calibration was not carried out during this certain period. However, the test reports were submitted by the PP for the entire period and applying the principles of conservativeness, the PP has adjusted the total generation from the WTG against the maximum permissible error of the meter as per EB guidance.</i>
4.	The above parameters are in line with the MP agreed in the registered PDD.	<i>Yes. See discussion above.</i>
5	The above parameters are in line with the monitoring methodology applied for the proposed project.	<i>Yes. See discussion above.</i>
6	Calibration entity and if the same is in line with the monitoring plan as agreed in the registered PDD.	<i>Meter testing has been carried out by the state electricity Boards i.e. Maharashtra State Electricity Distribution Company Limited (MSEDCL). The calibration entity is in line with the monitoring plan as mentioned in the VCS PD.</i>