

VERIFICATION REPORT OF 15 MW WIND ENERGY FARM AT GOPALPURA, KARNATAKA BY HZL



Bureau Veritas Certification Holding SAS
67/71 Boulevard du Château, 92200 Neuilly sur Seine, France

Project Title	15 MW Wind energy farm at Gopalpura, Karnataka by HZL
Version	02
Report ID	INDIA-VCS-VER/615.49/2013

Report Title	Verification Report of 15 MW Wind energy farm at Gopalpura, Karnataka by HZL
Client	Hindustan Zinc Limited
Pages	35
Date of Issue	25-November-2013
Prepared By	Bureau Veritas Certification Holding SAS
Contact	67/71 Boulevard du Château, 92200 Neuilly sur Seine, France Tél. : +33 (0)1 55 24 70 00 Fax : +33 (0)1 55 24 70 climatechange.ops@uk.bureauveritas.com www.bureauveritas.com
Approved By	Mr. Sanjay Patankar
Work Carried Out By	Ms. Sapana Pednekar (Team Leader) Mr. Pratik Bhattacharya (Team Member) Mr. Sanjay Patankar (Internal Technical Reviewer)

Summary:

Bureau Veritas Certification has made the Gap validation and verification of the “15 MW Wind energy farm at Gopalpura, Karnataka by HZL” project of Hindustan Zinc Limited located across villages Chudanahalli, Tekanhalli, Mallappanabetta, Bittagaudanahalli in district of Hassan in the state of Karnataka, India on the basis of Verified Carbon Standard Version 3, 8 October 2013, v3.4 as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as a periodic independent review and ex-post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases:

- i) desk review of the project design and the baseline and monitoring plan;
- ii) follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The project activity is to generate power (electrical energy) from renewable energy (wind energy), which displaces power generation from fossil fuel that would have been the scenario in absence of the project activity, thus achieve GHG emission reduction due to utilization of renewable energy.

The verification is based on the documents like Monitoring Report, Emission Reduction calculations and other supporting documents provided to the verification team. This verification is carried out in accordance with VCS Standard V.3, 8 October 2013, v3.4 and VCS Program Guide V.3, 8 October 2013 v3.5.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in Appendix I. The Gap validation and verification of the Project resulted in total 06 Corrective Action Requests (CAR) and 02 Clarification Requests (CL). The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in revised VCS PD and registered CDM PDD under CDM (UNFCCC no. 8303). Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project contributes towards GHG emission reductions. The GHG emission reduction is calculated without material mis-statements.

Table of Contents

Abbreviations	5
1 Introduction	6
1.1 Objective	6
1.2 Scope and Criteria	6
1.3 Level of assurance	6
1.4 Summary Description of the Project	8
2 Verification Process	9
2.1 Method and Criteria.....	10
2.2 Document Review	11
2.3 Interviews	11
2.4 Site Inspections	12
2.5 Resolution of Findings.....	12
2.5.1 Forward Action Requests.....	12
2.6 Eligibility for Validation Activities	12
3 Validation Findings.....	14
3.1 Participation under Other GHG Programs	14
3.2 Methodology Deviations.....	17
3.3 Project Description Deviations	18
3.4 Grouped Project	18
4 Verification Findings.....	18
4.1 Project Implementation Status	18
4.2 Accuracy of GHG Emission Reduction and Removal Calculations	21
4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals	22
4.4 Non-Permanence Risk Analysis	23

5	Verification conclusion	23
	APPENDIX II: <Documents referred during Verification and Validation of the Project Activity>	33
	APPENDIX III: < List of Persons interviewed >	34
	APPENDIX IV: <Curricula Vitae of the DOE'S Validation and Verification Team Members>.....	35

Abbreviations:

VER	Voluntary Emission Reduction
VCS	Verified Carbon Standard
VCU	Voluntary Carbon Unit
BMS	Bureau Veritas Certification's Management System
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
DR	Document Review
GHG	Green House Gases
I	Interview
IETA	International Emissions Trading Association
MV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non Governmental Organization
PD	Project Description
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
CDM	Clean Development Mechanism
MU	Million Units
KW	Kilowatt
KWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt-hour
EF	Emission factor
CESC	Chamundeshwari Electricity Supply Corporation Limited Mysore
PPA	Power Purchase agreement
JMR	Joint Meter Reading
CEA	Central Electricity Authority
PP	Project Participant
WTG	Wind Turbine Generator
KPTCL	Karnataka Power Transmission Corporation Limited

1 INTRODUCTION

1.1 Objective

Verification is the periodic independent review and ex-post determination by the verifier of the monitored reductions in GHG emissions during defined verification period. The objective of the verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project has generated verifiable emission reductions. This is the first verification of the project activity under VCS for the vintage from date on which actual emission reduction started i.e. 31/03/2011 (earliest date of commissioning of WTG in the power activity) to 30/11/2012 (one day prior to the start date of crediting period of CDM project activity). These emission reductions are verified as per the guidance provided by VCS standards version 3 dated 4 October 2012 v3.3.

The verification shall consider both qualitative and quantitative information on emission reductions. Quantitative data comprises the monitoring report and emission reduction calculations submitted to the verifier by the project participant and qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emission reports, review and internal audit of calculations/data transfers.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring reports, revised VCS PD for supplementary validation of the project as the project activity is already registered under CDM with UNFCCC, study of the monitored data and other relevant documents made available to verifier and information collected through performing interviews with the project Participant. The verification follows VCS Standard version 3 dated 8 October 2013, v3.4. The verification is not meant to provide any consulting toward the client. However, stated request for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Level of assurance

The verification team was provided with a monitoring report, covering the period 31/03/2011 to 30/11/2012 (inclusive of both the days). Based on this documentation, a document review and interview with the project participant regarding the implementation and emission reduction of the project activity were conducted. The Monitoring Report, version 03, dated 23/11/2013 covering the period from 31/03/2011 to 30/11/2012 (inclusive of both the days) serves as the basis for the assessment presented herewith.

The verification report is based on the documents made available to verification team and information provided during interviews. Based on the process and procedures conducted, it can be concluded that the GHG assertion.

1. Is materially correct and is a fair representation of GHG data and information, and
2. Has been prepared in accordance with VCS Standard Version 3 dated 8 October 2013 v3.4.

The data used for the calculation of emission reductions were taken from CEA (Central Electricity Authority). Form B issued by Chamundeshwari Electricity Supply Corporation Limited Mysore (CESC) was taken for monitoring of net electricity exported to the grid by project activity. As per the VCS PD, revised MR and the registered PDD with the UNFCCC (project ref. no. 8303), the calibration for the main and check meters will be done annually. The calibration certificate provided by the PP indicates that the calibration frequencies of the main meters and check meters having serial number 11068520 and 11068533 respectively of metering point GP04 is annual. However, the calibration frequency of main and check meters of metering points GP17, GP23 and GP31 (main meter serial numbers 11068516, 11068511 and 11068522 for metering points GP17, GP23 and GP31 respectively and check meter serial numbers 11068503, 11068519 and 11068527 for metering points GP17, GP23 and GP31 respectively) is not annual during this monitoring period. The main meters having serial number 11068520 was calibrated on 19/03/2011, 07/10/2011 and 06/08/2012 whereas 11068516, 11068511 and 11068522 were calibrated on 19/03/2011, 25/07/2011 and 15/12/2012. The check meters having serial numbers 11068533 were calibrated on 19/03/2011, 07/10/2011 and 06/08/2012 whereas 11068503, 11068519 and 11068527 were calibrated on 19/03/2011, 25/07/2011 and 15/12/2012. The results of calibration show that all the meters are working within the permissible limit of error. Therefore, the project participant has applied 0.2% error (which is the accuracy class of the energy meters) on Export, Import and Transmission loss values for the meter readings of the metering points GP17, GP23 and GP31 from the earliest scheduled date of calibration to the end of monitoring period (July 2012 to 30/11/2012) because of delayed calibration of main and check meters during this period. The verification team considers this approach as conservative and appropriate in line with VCS Validation and Verification Manual Version 3.1 dated 8 October 2013 and also in line with the requirements given under section 9.4.4 of the CDM Validation and Verification Standard, Version 04, EB 74 Annex 04.

As per the registered PDD for this project under CDM, the Generation details are obtained from Form B statement issued by KPTCL, however during verification it was observed that Form B statement is issued by. During interview with project participant it was clarified that Karnataka Power Transmission Corporation Limited is a registered company under the Companies Act, 1956 was incorporated on 28-7-1999 and is a company wholly owned by the Government of Karnataka. KPTCL was formed on 1-8-1999 by carving out the Transmission and Distribution functions of the erstwhile Karnataka Electricity Board. Further, there is order from Government of Karnataka having no. EN 131 PSR 2003 dated 06/07/2005 which states that the Government of Karnataka transfers the right relating to the procurement and supply of bulk electricity or trading of electricity from KPTCL to the five distribution companies viz. 1) Bangalore Electricity Supply Company Ltd., 2) Mangalore Electricity Supply Company Ltd., 3) Hubli Electricity Supply Company Ltd., 4) Gulbarga Electricity Supply Company Ltd and 5) Chamudeswary Electricity Supply Corporation Ltd with effect from 10/06/2005 onwards. Hence the Form B issued by CESC is acceptable.

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. Based on the process and procedure conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information which has been prepared in accordance with the VCS Standard 3.3 for the current verification period.

The verification team considers the assurance level as 'limited' since some of the data used (E.g. Emission factor) are from the publicly available databases such as CEA database for emission factor of the grid, for which detailed testing of GHG assertion is beyond the domain of project participant, stake holder and the verification team. In accordance with the VCS Standard Version 3.4, the materiality threshold applied was one percent. The accrued emission reductions for the current monitoring period from the project activity are 41, 352 tCO₂.

1.4 Summary Description of the Project

The project activity involves the installation of Suzlon make 10 numbers Wind Turbine Generator's (WTG) of capacity 1.5 MW each (model S-80) located across villages Chudanahalli, Tekanhalli, Mallappanabetta, Bittagaudanahalli in district of Hassan in the state of Karnataka, India. The total capacity of the project activity is 15 MW and the entire power generated by the project activity will be exported to the Southern Regional grid with a firm power purchase agreement with CESC. All the total 10 nos. of WTGs of the project activity are owned by Hindustan Zinc Limited.

The project is registered with the UNFCCC on 26/11/2012 (UNFCCC ref no 8303) and can be viewed from the weblink in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>) The project activity generates electricity using wind energy, which does not result in any greenhouse gas (GHG) emissions. Thus, this project activity leads to a reduction in GHG emissions that would otherwise have occurred when using electricity generated from conventional fossil fuel based sources in the Southern Regional grid.

All the 10 WTGs are connected to four feeders. The WTG(s) generate 3-phase power at 690 V, which is stepped up to 33 kV. For power evacuation GP-02, 03 and 04 are connected to feeder 1 (metering point GP04), GP-17 connected to Feeder 2 (metering point GP17), GP-23 and 24 are connected to Feeder 3 (metering point GP23) and GP 28, 29, 30 and 31 are connected to Feeder 4 (metering point GP31). The electricity exported and imported from the sub-station are metered using electronic tri-vector meters. A main and check meter is installed at every metering point/feeder for the project activity. There are four metering points/feeders for the project activity. All the four feeders are connected to Gopalpura substation, where the power is stepped up to 220 kV level and fed to the Grid. On a monthly basis, a joint meter reading carried out in the presence of the CESC officials and representatives of the project participant. For the purpose of calculating transmission losses, CESC will monitor electricity export from the Gopalpura substation through the sub-station bulk meter, and also electricity export from all metering points connected to the sub-station. The transmission loss percentage is computed by CESC in accordance with equations specified in the PPA(s). The net electricity supplied to the grid is calculated by CESC on the basis of main meter reading at every metering point/feeder for the project activity after adjusting transmission loss. These values calculated by the state electricity board are reported in the monthly Form B statement.

The main and check meters are electronic tri-vector meters of 0.2s accuracy class. The meter reading is taken jointly by the representatives of Suzlon and CESC in the form of JMR on monthly basis.

2 VERIFICATION PROCESS

The project is registered with the UNFCC dated 26/11/2012 (UNFCCC ref no 8303) and can be viewed from the weblink in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>). The certification body has also performed a supplementary validation and subsequent verification for the monitoring period starting from 31/03/2011 (Project start date as the first commissioning date of the WTG) to 30/11/2012 (one day before the start date of the crediting period under CDM). The VCS MR and VCS Verification report among other documents has been prepared separately for the verification activity.

2.1 Method and Criteria

The overall verification, beginning from the Contract Review to Verification report & opinion, was conducted using Bureau Veritas Certification internal procedures. The project is already validated and registered as a CDM project with UNFCCC on 26/11/2012 (UNFCCC ref no 8303). The verification criteria followed by the project participant is based on the VCS standards Version 3. This is the first verification of the project activity under VCS for the vintage from date on which actual emission reduction started (31/03/2011, earliest date of commissioning of WTG in the power activity) till 30/11/2012 (one day prior to the start date of crediting period of CDM project activity). These emission reductions are verified as per the guidance provided by VCS standards Version 3. The verification process consists of following activities:

- i) *Desk review of the registered project document including the baseline and the monitoring plan;*
This process consists of the review of the current and previously approved documents related to the project activity including validation report under CDM, registered CDM PDD and revised VCS PD. The current documents include the Monitoring report for the current verification period, emission reduction spreadsheet and other supporting documents (Form B issued by CESC, calibration certificates, invoices, etc.) pertaining to the current verification period. Refer to Appendix II for the list of documents.
- ii) *Interviews with project stakeholders and Document Review;*
The second step involves the Interviews and discussion with the Project Participants and as well as review of documents mentioned under Appendix II to ensure the implementation and operation of the project activity in line with the registered CDM PDD under CDM:
- iii) *Resolution of outstanding issues and the issuance of the final verification report including verification opinion*
The third step involves the resolution of the CAR/CL raised. Verification process also includes raising the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification before conclusion on the GHG emission reduction calculation.

Findings established during the initial verification could either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified. Corrective Action Requests (CAR) is issued, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions, which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation and/or 1st verification to be verified during subsequent verification have not been resolved by the project participants;
- The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS requirements is met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix 1.

The verification of the Project alone resulted in 03 Corrective Action Request and 01 Clarification Request.

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure. The closure of CARs and CLs are discussed under Appendix 1 of the verification report.

The project activity involves 100% monitoring of data related to emission reduction calculation. No sampling plan has been envisaged.

2.2 Document Review

The verification team has assessed the accuracy of the project description including monitoring plan through a combination of steps consisting of site visit inspection, review of contract related to the project activity, Scrutiny of technical specification and interview of the project participant and their representatives. Following supporting documents were reviewed for the current verification period:

- Registered CDM PDD, CDM Validation Report, Emission reduction spreadsheet submitted under CDM and revised VCS PD of the project activity.
- Monitoring report and emission reduction spreadsheet for the current verification period.
- Form B issued by CESC, monthly Invoices and calibration certificates of the energy meters pertaining to the current verification period.
- Commissioning certificate for all the WTGs and Power Purchase Agreements of the project activity.

2.3 Interviews

On 22/10/2013, during site visit, one member team from Bureau Veritas Certification performed interviews with the representative of the project participant and O & M Service provider to confirm selected information and to resolve issues identified in the document review. Representatives of Hindustan Zinc Limited and Suzlon Energy Limited (O & M Service provider) were interviewed. The main topics of the interviews are summarized in Table below:

Interviewed organization	Interview topics
Hindustan Zinc Limited (Project Participant)	• Project implementation and changes; if any • Monitoring • Data recording and archiving • Monitored data • Emission reduction calculation procedures • Resolution of CAR(s) and CL(s)

Suzlon Energy Limited (O & M Service provider)	• Monitoring Plan • Data uncertainty and residual risks • Calibration of equipment • Performance of plants • Personnel competence • Emergency Situations • Data uncertainty and residual risks • QA/ QC Procedures • Internal review / verification mechanism
---	---

2.4 Site Inspections

This is first verification of the project activity under VCS for the vintage from 31/03/2011 to 30/11/2012. The physical site visit for the verification period carried out by one competent verifier (Part of Verification Team) on 22/10/2013 and the period when site visit conducted is post the current verification period.

The verification team reviewed all the records of the sold electricity and the JMR reports (issued by the state electricity utility which is a government entity) for the current verification period and confirms that there is no change in the project design with respect to registered PDD under CDM.

2.5 Resolution of Findings

The project is registered with the UNFCCC dated 26/11/2012 (UNFCCC ref no 8303) under the project title '15 MW Wind energy farm at Gopalpura, Karnataka by HZL'. Bureau Veritas Certification has reviewed the registered PDD and Validation report to confirm that all the outstanding issues regarding the project were resolved successfully during validation under CDM. The verification team confirms that there are no remaining issues or any material discrepancy in the project activity by reviewing the documents uploaded in the UNFCCC website and supporting documents mentioned under Appendix II of this document. However, the verification of the Project alone resulted in 03 Corrective Action Request and 01 Clarification Request during the current verification period and was subsequently closed by the verification team on the basis of correct and appropriate response by the Project participant. The closure of CAR(s) and CL are discussed under Appendix I of the verification report.

2.5.1 Forward Action Requests

No forward action request is raised during this verification.

2.6 Eligibility for Validation Activities

The project is registered with the UNFCCC on 26/11/2012 (UNFCCC ref no 8303) and can be viewed from the weblink in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>). The certification body has performed a supplementary validation and VCS PD and VCS validation report among other documents has been prepared separately for the validation activity.

Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation report is based according to the VCS Standard V.3, 8 October 2013, v3.4 and Validation report template version 3.3 which is the latest available at the VCS official website (<http://v-c-s.org/>). The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- ✓ It organizes details and clarifies the requirements a CDM project is expected to meet;
- ✓ It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

As per the policy announcement of VCS dated 8 October 2013, only a supplementary validation is carried out for sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of VCS PD for all projects registered under CDM. The validation team was provided with a VCS PD along with other relevant documents. Based on this documents and review and interviews performed, a supplementary validation was conducted for the above mentioned sections of VCS PD and reported.

Document Review

The validation team has assessed the accuracy of the project description through a combination of steps consisting of site visit inspection, review of contract related to the project activity, Scrutiny of technical specification and interview of the project participant and their representatives. Following supporting documents were reviewed for the current verification period:

- Registered CDM PDD, CDM Validation Report, Emission reduction spreadsheet submitted under CDM and revised VCS PD of the project activity.
- VCS PD, guidelines for completing VCS PD (VCS Version 3 dated 8 October 2013 v3.2), approved methodology.
- VCS Standard V.3, 8 October 2013, v3.4
- Commissioning certificate for all the WTGs and Power Purchase Agreements of the project activity.

Interviews

On 22/10/2013, during site visit, one member team from Bureau Veritas Certification performed interviews with the representative of the project participant and O & M Service provider to confirm selected information and to resolve issues identified in the document review. Representatives of Hindustan Zinc Limited and Suzlon Energy Limited (O & M Service provider) were interviewed. The main topics of the interviews are summarized in Table below:

Interviewed organization	Interview topics

Hindustan Zinc Limited (Project Participant)	• Project design and implementation status. • Supporting data, evidences and documentation • Project start date and Crediting Period • Resolution of CAR(s) and CL(s) • Emission reductions calculation.
Suzlon Energy Limited (O & M Service provider)	• Project technology, operation and maintenance. • Monitoring System and metering system to be adopted at site

Site Inspections

The project is registered with the UNFCCC on 26/11/2012 (UNFCCC ref no 8303). The physical site visit was carried out by one competent Validator (Part of Validation Team) on 22/10/2013 to confirm the selected information and to resolve issues identified in the document review.

Representatives of Hindustan Zinc Limited and Suzlon Energy Limited were interviewed (see Appendix– III of this report).

Resolution of Any Material Discrepancy

The objective of this phase of the supplementary validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification conclusion on the project design. To guarantee the transparency of the validation process, the validation team raised Corrective Action Request (CAR) and Clarification request (CL). The supplementary validation of the Project resulted in 03 CAR(s) and 01 CL. The CAR(s) and CL were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure. The closure of CAR(s) and CL are discussed under Appendix I of this report.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Project Design

The project activity is registered as CDM project activity by CDM-EB on 26/11/2012 (UNFCCC ref no 8303). The registered PDD was used during the course of supplementary validation and the technology used is validated at site as described in UNFCCC registered PDD.

The crediting period for the Certified Emission Reductions (CER) under CDM has started from 01/12/2012 as mentioned in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>). The crediting period for the VCS has been mentioned as 31/03/2011 to 30/11/2012 which is the date from commissioning of first WTG till one day prior to the start date of crediting period of CDM project activity. The project is registered with the UNFCCC on 26/11/2012 (UNFCCC ref no 8303). The project participants have provided a declaration that there is no double counting of emission reduction claimed by the project activity under VCS and CDM simultaneously for the monitoring period (31/03/2011 to 30/11/2012) under consideration. Hence the project crediting period is acceptable to the VCS validation team.

The validation team validated the following points under the project design:

- **Project scope, type, technologies and measures implemented, and eligibility of the project**

The project activity is applicable to 'Scope Number 1, Sectoral Scope – Energy industries (renewable/non-renewable sources). This project activity involves generation of energy (electricity) using wind energy (renewable source) conversion systems, and hence conforms to category no. 1. The project has applied approved methodology AMS I.D; Version 17 and the project activity is eligible to apply this methodology. The validation team has validated the correctness of these by reviewing the registered PDD, validation report, document review such as commissioning certificates and power purchase agreement as well as interview with the project participant.

- **Project participant-** The project participants for the project activity concerned Hindustan Zinc Limited. The validation has reviewed the Host Country Approval to confirm this.
- **Project start date-** The project start date for the project activity concerned is the earliest date of commissioning amongst the WTGs i.e. 31/03/2011. The validation has reviewed the commissioning certificate of all the WTGs to confirm this.
- **Project crediting period-** The project crediting period for the project activity concerned is from the earliest date of commissioning of the WTGs till one day prior to the start date of crediting period of CDM project activity. Therefore, the crediting period for the project activity is from 31/03/2011 to 30/11/2012. The validation team has reviewed the commissioning certificate of all the WTGs and UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>) to confirm this. The project is registered with the UNFCCC on 26/11/2012 (UNFCCC ref no 8303). The project participants have provided a declaration that there is no double counting of emission reduction claimed by the project activity under VCS and CDM simultaneously for the monitoring period (31/03/2011 to 30/11/2012) under consideration. Hence the project crediting period is acceptable to the VCS validation team.

- **Project scale and estimated GHG emission reductions or removals-** The project activity is not a large scale project activity as the estimated annual GHG emission reduction is 41, 352 tCO₂e which is less than 300, 000 tCO₂e per year which is in line with paragraph 3.9.1 of the VCS standard Version 3 dated 8 October 2013 v.3.4. The validation team has validated the correctness of these by reviewing the registered PDD, validation report and emission reduction calculation sheet from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>).
- **Project activities-** In line with paragraph 3.11.9 of the Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4; only a supplementary validation is to be carried out for sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of VCS PD for all projects registered under CDM. The project description is not included in these sections. Please refer to the registered PDD in UNFCCC, Project No. 8303 (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>) for project description and how the validation team validated the accuracy of the project description.
- **Project location-** The project activity involves the installation of Suzlon make 10 numbers Wind Turbine Generator's (WTG) of capacity 1.5 MW each in villages across Chudanahalli, Tekanhalli, Mallappanabetta and Bittagaudanahalli in district of Hassan in the state of Karnataka, India. The validation team has validated the accuracy of the project location from registered PDD, validation report, document review such as commissioning certificates, power purchase agreement as well as interview with the project participant and site visit conducted by one competent Validator (Part of Validation Team) on 22/10/2013.
- **Project compliance with applicable laws, statutes and other regulatory frameworks-** In line with paragraph 3.11.9 of the Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4; only a supplementary validation is to be carried out for sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of VCS PD for all projects registered under CDM. The Project compliance with applicable laws, statutes and other regulatory frameworks not included under these clauses.
- **Ownership and other programs**
 - **Right of use-** The validation team has reviewed the documents like power purchase agreement, commissioning certificate and Form B approved and issued by CESC (Joint Meter Statements) which substantiates the right of use for the concerned project activity.
 - **Emissions trading programs and other binding limits-** India is a non Annex-I as recognised by the Kyoto Protocol which can be confirmed from the UNFCCC website (http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php). Hence, there are no GHG emission reduction targets or commitments for India and it does not fall under the purview of any compliance driven Emission Trading Programs. Furthermore, there are also no such voluntary emission trading programs similar to the VCS exist in India.
 - **Participation under other GHG programs-** The WTGs under the project activity has applied for CDM registration and got registered on 26/11/2012 under UNFCCC CDM EB with project

reference number – 8303 which can be confirmed from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>).

- **Other forms of environmental credit sought or received**- The WTGs under the project activity has applied for CDM registration and got registered on 26/11/2012 under UNFCCC CDM EB with project reference number – 8303 which can be confirmed from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>). Thus it will earn revenue from CDM.
- **Rejection by other GHG programs**- The project activity has applied for CDM registration and got registered on 26/11/2012 under UNFCCC CDM EB. Other than CDM, the project activity has not being applied under other GHG programs like Gold Standard which can be confirmed from the website <http://www.cdmgoldstandard.org/our-projects/project-registry> and hence the project activity is not rejected under other GHG programs.

- **Additional information relevant to the project**

- **Eligibility criteria for grouped projects**- The project activity is not a grouped projects which can be confirmed from registered PDD, validation report, HCA and interview with the project participant.
- **Leakage management for AFOLU projects**- The concerned project is a wind project activity and hence is not an AFOLU project.
- **Commercially sensitive information**- There is no commercially sensitive information that has been excluded which the validation team confirms from the document review and interview with the project participant.
- **Any further information**- There is no additional information that may have a bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of project's site specific net GHG emission reductions or removals which the validation team confirms from the document review and interview with the project participant.

Validation Conclusion

The project activity meets criteria of CDM under UNFCCC for achieving estimated emission reductions. CDM is one of the approved programs under Verified Carbon Standard (VCS). However, a supplementary validation of the sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 was carried out in line with paragraph 3.11.9 of the Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4 to confirm that project is likely to achieve estimated emission reduction, which would not have been reduced in absence of the project activity.

3.2 Methodology Deviations

There were no deviations from the referred methodology AMS I.D; Version 17 as compared to UNFCCC registered PDD and Registered Validation Report. Hence the validation team could conclude that the project activity does not require any deviation from the Methodology referred.

3.3 Project Description Deviations

As per section 3.6.1.2 of VCS standard 3.4, “Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report. This shall include a description of when the changes occurred and the reasons for the changes. The deviation shall also be described in all subsequent monitoring reports. Examples of such deviations include changes in the procedures for measurement and monitoring, or project design changes that do not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.”

For the project activity under verification, as per the registered PDD with the UNFCCC (project ref. no. 8303), the calibration has to be conducted once in a year. However, it was evident from the calibration certificate that there was a delay in calibration in the year 2012 for the metering points GP17, GP23 and GP31. For this, the project participant has applied error equivalent to the accuracy class of the energy meter (0.2%) for the months of 2012 where there is a delay in calibration as the meters were working within the permissible limits of error. This is in line with latest version of VCS Validation and Verification Manual and the requirements given under section 9.4.4 of the CDM Validation and Verification Standard.

This is a project description deviation. However, as per under 3.6.1.2 of VCS standard 3.4, this deviation is not impacting the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology. This deviation is also specifically related to this monitoring period and will not impact the subsequent monitoring periods. This deviation is also adequately and appropriately described in the Section 2.2 of the MR (i.e. Project Description Deviations) based on the above mentioned requirements.

3.4 Grouped Project

Not applicable as this is not a grouped project. Please refer to the registered PDD in UNFCCC, Project No. 8303 (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view>) for project description and how the validation team validated the accuracy of the project description.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves the installation of Suzlon make 10 numbers Wind Turbine Generator's (WTG) of capacity 1.5 MW each (model S-80) located across villages across Chudanahalli, Tekanhalli, Mallappanabetta and Bittagaudanahalli in district of Hassan in the state of Karnataka, India. The total capacity of the project activity is 15 MW and the entire power generated by the project activity will be exported to the Southern Regional grid with a firm power purchase agreement with CESC. The WTGs were commissioned on 31/03/2011 and 21/05/2011.

All the 10 WTGs are connected to four feeders. The WTG(s) generate 3-phase power at 690 V, which is stepped up to 33 kV. For power evacuation GP-02, 03 and 04 are connected to feeder 1 (metering point GP04), GP-17 connected to Feeder 2 (metering point GP17), GP-23 and 24 are connected to Feeder 3 (metering point GP23) and GP 28, 29, 30 and 31 are connected to Feeder 4 (metering point GP31). The electricity exported and imported from the sub-station are metered using electronic tri-vector meters. A main and check meter is installed at every metering point/feeder for the project activity. There are four metering points/feeders for the project activity.

All the four feeders are connected to Gopalpura substation, where the power is stepped up to 220 kV level and fed to the Grid. On a monthly basis, a joint meter reading carried out in the presence of the CESC officials and representatives of the project participant. For the purpose of calculating transmission losses, CESC will monitor electricity export from the Gopalpura substation through the sub-station bulk meter, and also electricity export from all metering points connected to the sub-station. The transmission loss percentage is computed by CESC in accordance with equations specified in the PPA(s). The net electricity supplied to the grid is calculated by CESC on the basis of main meter reading at every metering point/feeder for the project activity after adjusting transmission loss. These values calculated by the state electricity board are reported in the monthly Form B statement.

The main and check meters are electronic tri-vector meters of 0.2s accuracy class. The meter reading is taken jointly by the representatives of Suzlon and CESC in the form of JMR on monthly basis.

The monitoring methodology used for the project activity is AMS I.D, Version 17 (which is an approved monitoring methodology by the CDM Executive Board). The title of the monitoring methodology is "Grid connected renewable electricity generation". The key parameter to be monitored for calculation of emission reductions is the "net electricity supplied to the grid by the project activity". The same is being monitored by the project participant through installation of the main and check meters as discussed above.

The records of the sold electricity from the project are verified by a government agency. As per the VCS PD, revised MR and the registered PDD with the UNFCCC (project ref. no. 8303), the calibration for the main and check meters will be done annually. The calibration certificate provided by the PP indicates that the calibration frequencies of the main meters and check meters having serial number 11068520 and 11068533 respectively of metering point GP04 is annual. However, the calibration frequency of main and check meters of metering points GP17, GP23 and GP31 (main meter serial numbers 11068516, 11068511 and 11068522 for metering points GP17, GP23 and GP31 respectively and check meter serial numbers 11068503, 11068519 and 11068527 for metering points GP17, GP23 and GP31 respectively) is not annual during this monitoring period. The main meters having serial number 11068520 was calibrated on 19/03/2011, 07/10/2011 and 06/08/2012 whereas 11068516, 11068511 and 11068522 were calibrated on 19/03/2011, 25/07/2011 and 15/12/2012. The check meters having serial numbers 11068533 were calibrated on 19/03/2011, 07/10/2011 and 06/08/2012 whereas 11068503, 11068519 and 11068527 were calibrated on 19/03/2011, 25/07/2011 and 15/12/2012. The results of calibration show that all the meters are working within the permissible limit of error. Therefore, the project participant has applied 0.2% error (which is the accuracy class of the energy meters) on Export, Import and Transmission loss values for the meter readings of the metering points GP17, GP23 and GP31 from the earliest scheduled date of calibration to the end of monitoring period (July 2012 to 30/11/2012) because of delayed calibration of main and check meters during this period. The verification team considers this approach as conservative and appropriate in line with VCS Validation and Verification Manual Version 3.1 dated 8 October 2013 and also in line with the requirements given under section 9.4.4 of the CDM Validation and Verification Standard, Version 04, EB 74 Annex 04.

The verification team has referred documents Commissioning certificates, Power Purchase Agreements, Form B statements issued by CESC, Invoice raised by the project participant for the project activity WTGs and interview with the representatives of the PP to confirm that the project design, implementation and operation is in compliance with the registered PDD under and applied monitoring methodology AMS I.D version 17. The verification team also confirms that monitoring of the parameters has been carried out in accordance with the monitoring plan of the registered PDD with UNFCCC, revised PD and monitoring report. In addition, the data cross-checking procedures, calibration procedures, frequency of calibration and data uncertainty procedures remains same as it was provided in the registered PDD. Hence, the verification team confirms that the project monitoring plan is in compliance with the registered PDD, revised PD and applied monitoring methodology AMS I.D version 17.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Project participant provided the spreadsheet used for calculating the emission reductions including the algorithms used in the calculations. The calculations of above parameters were checked in the spreadsheets and found to be correct. The spreadsheet of emission reduction calculation contains information on i.e. net electricity exported to the grid. This information is taken from Form B issued by CESC based on the monthly joint meter readings taken jointly by the representatives of Suzlon and CESC.

To calculate emission reduction as per algorithm given in methodology, baseline emission is calculated by multiplying combined margin emission factor with total value of net electricity exported to grid. The project emissions and Leakage is considered zero which is in line with registered PDD and revised PD.

The verification team based on the review of calibration certificates of all the Energy Meters and observation during site visit confirms that there is no meter change that had happened during the current verification period and that all the meters are working within the permissible limit of error. All the data in the revised emission reduction spreadsheet was found to be correct and accurate. There is no possible transposition errors between data sets since the monitoring of the net electricity generated is through calibrated electronic meters with high accuracy and also the value of parameter net electricity exported to the grid is taken from Form B issued by CESC which is government entity and cross-checked with the monthly invoice raised by the project participants to CESC. Also all the recorded data is verified by the verification team. The verification team found that the monitoring plan provided in the monitoring report is same as that described in the VCS PD and it is in line with actual monitoring taking place on the site of the project activity.

Emission Reductions:

The emission reduction calculations have been carried out from the following algorithm as per applied methodology AMS I.D version 16:

$$ER_y = BE_y - PE_y - LE_y$$

Baseline emissions (BE_y)

The verification team confirms that project participant has computed the baseline emissions in accordance with the guidance provided in the methodology. The net electricity supplied by the project activity to the grid has been multiplied with the Southern regional grid electricity emission factor.

The verification team confirms through the review of the monitoring arrangements and the Form B statements issued by CESC that for the entire current periodic verification, the electricity exported to the grid and imported from the grid was monitored through high accuracy class bi-directional tri-vector energy meters (0.2s accuracy class) capable of continuous monitoring. The recording of the data was carried out on monthly basis. This is in accordance with the applied methodology and the monitoring plan of the registered PDD under CDM and revised VCS PD. The net electricity supplied to the grid was also cross-checked by the verification team through the invoices raised by the project participant for the sold electricity.

The grid emission factor, calculated on the basis of the combined margin is 0.9154 tCO₂/MWh and is fixed ex-ante at the time of the CDM validation of the project activity.

Hence, the verification team confirms that the baseline emissions computed for the current verification are appropriate and conservative and the calculation provided under emission reduction spreadsheet is correct. The total baseline emissions for the current verification period from 31/03/2011 to 30/11/2012 (Including both days) are 41,352 CO₂ (rounded down value).

Project Emissions (PEy):

The project activity consists of electricity generation and supply to the grid by using renewable energy (wind energy). There is no project emission associated with renewable wind energy hence project emissions are taken as zero which is also in line with the applied methodology.

Leakages (LEy):

The verification team found that there are no leakages attributable and accountable to Project. This is in accordance with registered PDD, revised PD and applied methodology.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

CESC issues Form B statements based on monthly Meter readings taken jointly by representative of Suzlon and CESC at the JMR sites. On the basis of this data issued by CESC, project participant raises invoice.

The verification team has reviewed the calibration certificates of all the meters and confirm that all the meters are working within the permissible limit of error thus ensuring error free measurements. The data pertaining to the above parameters are maintained in identified records for the entire monitoring period. All the data is in compliance with the figures stated in the monitoring report.

The Verification team interacted with Suzlon Energy Limited, who is the windmill supplier and O&M service provider. The agency is experienced in the monitoring system and is managing O&M of numerous other wind farm CDM projects across the host country (India). The Verification team therefore is of the opinion that the project participant through its competent O&M agency

has implemented the monitoring plan in line with the registered PDD in the context of the project activity.

4.4 Non-Permanence Risk Analysis

The data used for the calculation of emission reductions are emission factor of Southern Regional Grid of India and Net electricity supplied to the grid. Emission factor is taken from CEA (Central Electricity Authority), Ministry of Power, Government of India. Form B is issued by Chamundeshwari Electricity Supply Corporation Limited, Mysore (CESC) which is a Government of Karnataka Undertaking company. The form B contains the Export, Import and Transmission loss data month wise by which Net electricity supplied to the grid is calculated. The net electricity supplied to the grid was also cross-checked by the verification team through the invoices raised by the project participant for the sold electricity to CESC. The verification team has reviewed the calibration certificates issued by KPTCL and CESC of all the meters and confirm that all the meters are working within the permissible limit of error thus ensuring error free measurements. All the data related to the emission reduction calculation for the monitoring period is taken from Government bodies in India and therefore, considered authentic. Therefore, the Verification team concludes that there is no risk involved in the project activity.

5 VERIFICATION CONCLUSION

The verification scope is an independent and objective review of the VCS Project description, the project's baseline study and monitoring plan and other relevant documents. The review is to verify the implementation of monitoring plan as defined in validated VCS PD. The period for verification is from 31/03/2011 to 30/11/2012 (inclusive of both the days). The verification of the monitored data indicates the emission reductions and the amount for emission reductions for the monitoring period are provided below:

Monitoring Period		Total Emission Reductions Achieved (tCO ₂ e)
From	To	
31/03/2011	31/12/2011	19544
01/01/2012	30/11/2012	21808

The calculations of emission reductions are found to be correct. The baseline for the Southern regional grid has been taken for arriving at baseline emissions. The grid emission factor of 0.9154 tCO₂e/MWh for Southern regional grid was found to be correct.

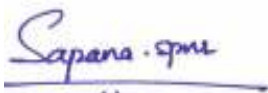
Appropriate procedures for maintaining the confidentiality and safe custody of the validation or verification documentation and for retaining them for a period sufficient to meet the needs of the client, the responsible parties, the GHG programmes to which they subscribe, and in accordance with legal and professional requirements of record retention have been established.

The verification team confirms that the project is implemented as planned and described in the Registered PDD with UNFCCC under CDM and revised PD. The monitoring mechanism is effective and reliable. The reported data are accurate and correct based on all the records provided to the verification team during the verification as provided in annexure-III. The installed equipments being essential for generating the emission reductions run reliably and the measuring equipments/instruments are calibrated.

Reporting period: 31/03/2011 to 30/11/2012

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	41352
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	41352



Sapana Pednekar

(Team Leader)

25/11/2013



Sanjay Patankar

(Internal Technical Review)

25/11/2013

APPENDIX I: < DETAILS OF CORRECTIONS AND CLARIFICATIONS REQUESTED AND ITS RESOLUTION>

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
CAR 1: The contact information in the box of the cover page is not complete in nature as per latest version of project description template (e.g. website address is not provided).	Cover Page of VCS PD	The contact information in the box of the cover page has been updated in revised VCS-PD version 03.	The contact information in the box of the cover page of the revised VCS PD is now complete in nature as per latest version of project description template (Version 3.1). Hence CAR 1 is closed.
CAR 2: 1. The value of annual electricity generated from the project activity is not matching with the registered PDD. 2. Project type is incorrectly mentioned in section 1.2. 3. Contact information is not detailed and roles/responsibilities of the project participant is not mentioned in section 1.3. 4. Description under section 1.4 is	1.1, 1.2, 1.3, 1.4, 1.5, 1.9 and 1.10 of VCS-PD	1. The value of the annual electricity generated from the project activity has been corrected in the revised VCS-PD version 03. 2. Project type is corrected in section 1.2 of the revised VCS-PD version 03. 3. Contact information has been corrected as per the latest version of the project description template in the revised VCS-PD version 03. 4. Description under section 1.4 has been corrected in the revised VCS-PD version 03.	1. The value of annual electricity generated from the project activity is given as 34,821 MWh in the revised PD which is matching with the registered PDD. 2. Project type is now correctly mentioned in section 1.2 of revised PD. 3. Contact information is now detailed and roles/responsibilities of the project participant is now appropriately and transparently mentioned in section 1.3 of the revised PD. 4. Description under section 1.4 of revised PD is now elaborate and appropriate in

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
not appropriate. 5. Date of commissioning of first WTG in section 1.5 is not matching with the registered PDD and commissioning certificates. 6. The details of Project Locations are not elaborately mentioned in the section 1.9. 7. The description provided under section 1.10 is not elaborate in nature and not as per latest version of project description template.		5. Date of commissioning of first WTG has been corrected in entire revised VCS-PD version 03. 6. Details of the project location have been corrected in the revised VCS-PD version 03. 7. The description under section 1.10 has been updated in revised VCS-PD version 03.	nature. 5. Date of commissioning of first WTG in section 1.5 of revised PD is mentioned as 31/03/2011 which is matching with the registered PDD and commissioning certificates. 6. The details of Project Locations are now elaborately mentioned in the section 1.9 of the revised PD. 7. The description provided under section 1.10 of the revised PD is now elaborate in nature and as per the latest version of project description template (Version 3.1). Hence CAR 2 is closed.
CAR 3: 1. The description provided under section 1.12.2 is not in line with the requirement of VCS Standard Ver 3.3, paragraph number 3.11.2. 2. Description under 'Further Information' under section 1.13 is not elaborate in line with latest version of project description	1.12.2 and 1.13 of VCS- PD	1. The description provided under section 1.12.2 has been corrected in revised VCS-PD version 03. 2. Description under section 1.13 has been elaborate as per the latest version of project description template in revised VCS-PD version 03.	1. The description provided under section 1.12.2 of the revised VCS-PD is in line with requirement of VCS Standard Ver 3.3, paragraph number 3.11.2. 2. Description under 'Further Information' under section 1.13 of the revised PD has been elaborated in line with latest version of project description template (Version 3.1).

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
template.			Hence CAR 3 is closed.
CL 1: 1. The start and end date of the VCS Crediting Period in section 1.6, 1.7 and 1.12.4 is taken upto before the crediting period start date under CDM. Please justify the appropriateness. 2. Power Purchase Agreements of the project activity is not provided.	1.6, 1.7 and 1.12.4 of VCS-PD	1.The VCS crediting period of the project activity is taken upto before the crediting period start date under CDM,because HZL will not claim for GHG emission reduction credits for the given period under any other emission trading program. 2. Power Purchase Agreements has been provided.	1. The project activity generates Carbon Credits under CDM (Ref.No:8303) from 01/12/2012; however the VCU(s) that are claimed are from the date of commissioning till 30/11/2012 because the project is registered on 26/11/2012 but the crediting period under CDM starts only on 01/12/2012. The project participants have provided a declaration that there is no double counting of emission reduction claimed by the project activity under VCS and CDM simultaneously for the monitoring period (31/03/2011 to 30/11/2012) under consideration. Hence it is hereby confirmed that the project activity does not result in creation of another form of environmental credit during the period for which VCU(s) are claimed. 2. The Power Purchase agreement has been provided. Hence CL 1 is closed.
CAR 4: 1. The contact information in the box of the cover page is not	Cover Page of VCS MR	1. The contact information and other details have been updated in revised MR	1. The contact information in the box of the cover page of the revised version of VCS MR is complete in nature and as per

Draft report clarifications and corrective action requests by validation team	Reference/Section	Summary of project owner response	Validation team conclusion
complete in nature as per latest version of VCS MR template (e.g. email address, website address is not provided, Monitoring period date is not mentioned in correct format and Project ID is not correct). 2. The font letter and size is not consistent throughout the report as per latest version of VCS MR template.		of version 03. 2. The font letter and size is consistent throughout the revised MR of version 03.	latest version of VCS MR template (Version 3.2). 2. The font letter and size is now consistent throughout the report as per latest version of VCS MR template (Version 3.2). Hence CAR 4 is closed.
CAR 5: 1. The value of annual electricity generated from the project activity is not matching with the registered PDD. 2. Date of commissioning of WTGs in section 1.1, 1.5 and 2.1 is not matching with the registered PDD and commissioning certificates. 3. Project type is incorrectly mentioned in section 1.2. 4. Contact information is not detailed and roles/responsibilities of	Section 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 2.1 of VCS MR	1. The value of annual electricity generated from the project activity has been changed in the revised MR version 03. 2. Date of commissioning of WTGs has been corrected in revised MR version 03. 3. Project type is corrected in the revised MR of version 03. 4. The contact information has been updated as per latest version of VCS MR	1. The value of annual electricity generated from the project activity is given as 34,821 MWh in the revised MR which is matching with the registered PDD. 2. Date of commissioning of the WTGs in section 1.1, 1.5 and 2.1 of revised MR is mentioned as 31/03/2011 which is matching with the registered PDD and commissioning certificates. 3. Project type is now correctly mentioned in section 1.2 of revised MR. 4. Contact information is now detailed and roles/responsibilities of the project participant is now appropriately and transparently mentioned in section 1.3 of

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
the project participant is not mentioned in section 1.3. 5. Description under section 1.4 is not appropriate. 6. The start and end date of the VCS Crediting Period in section 1.6 and 2.1 is taken upto before the crediting period start date under CDM. Please justify the appropriateness. 7. Information regarding the operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring is not provided in section 2.1 as per latest version of VCS Monitoring report template.		template. 5. Section 1.4 has been updated in the revised MR of version 03. 6. The VCS crediting period of the project activity is taken upto before the crediting period start date under CDM,because HZL will not claim for GHG emission reduction credits for the given period under any other emission trading program. 7. During the monitoring period no such events or situations occurred which will cause impact on the actual operation of the project activity.	the revised MR. 5. Description under section 1.4 of revised MR is now elaborate and appropriate in nature. 6. The project activity generates Carbon Credits under CDM (Ref.No:8303) from 01/12/2012; however the VCUs that are claimed are from the date of commissioning till 30/11/2012 because the project is registered on 26/11/2012 but the crediting period under CDM starts only on 01/12/2012. The project participants have provided a declaration that there is no double counting of emission reduction claimed by the project activity under VCS and CDM simultaneously for the monitoring period (31/03/2011 to 30/11/2012) under consideration. Hence it is hereby confirmed that the project activity does not result in creation of another form of environmental credit during the period for which VCUs are claimed. 7. Information regarding the operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring is

Draft report clarifications and corrective action requests by validation team	Reference/Section	Summary of project owner response	Validation team conclusion
			now elaborately provided in section 2.1 as per latest version of VCS Monitoring report template (Version 3.2). Hence CAR 5 is closed.
CL 2: 1. There is an inconsistency in the number of energy meters. Calibration Certificate from KPTCL letter dated 19/03/2011 refers 14 energy meters whereas MR refers 8 number energy meters and Calibration certificate dated 30/07/2011 (calibration date was 25/07/2011) and 28/10/2011 (calibration date was 07/10/2011) is given for only 8 meters. Further none of the Calibration certificates of Energy Meters for the year 2012 is provided. Please clarify. 2. The earliest commissioning date of the project activity WTG is on 31/03/2011. However the monitoring period and the Emission reduction calculation are based on data from April 2011 to November 2012. Please clarify the	Calibration certificate, Form-B statement, Invoices, VCS MR and ER sheet	1. KPTCL calibrates the all the meters connected to grid and mentioned the details of all of those in calibration certificate. Energy generated by the project activity measured at 4 points only (4 Main meters and 4 back up meters) with total 8 meters. Calibration certificates of year 2012 are provided. The meter Nos which are used for measuring the energy generated by project activity are as follows: 1) 11068520; 2) 11068533; 3) 11068516; 4) 11068503; 5) 11068511; 6) 11068519; 7) 11068522; 8) 11068527 2. The monitoring report and emission reduction spread sheet has been updated in the revised MR version 03.	1. KPTCL/CESC calibrates the all the meters connected to grid and the details of all the energy meters are mentioned in calibration certificate. Energy generated by the project activity is measured at 4 points only and there are only 4 Main and 4 check meters installed for the project activity. Further, all the Calibration certificates of Energy Meters for the year 2011 and 2012 is provided to the verification team. Hence acceptable to the verification team. 2. The earliest commissioning date of the project activity WTG is on 31/03/2011 and monitoring period and the Emission reduction calculation are also based on data from 31/03/2011 to 30/11/2012.

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
appropriateness of the same. 3. The export data of Feeder-2 for the month of May 2011 and Feeder-1 for the month of September 2011 is not matching with export reading of Main Meter in the Form B statement. 4. The Transmission loss calculation is not elaborated Feeder wise as in the case of Export and Import reading in the revised ER spread sheet. Also the Transmission loss value in the excel sheet is not matching with the reading given in the Form B statement. Please clarify.		3. The export data of feeders-2 of the month May 2011 has been corrected in the revised version of ER spread sheet and MR version 03. The export data of Feeder-1 of sept-2011 taken from check meter as mention in note on B-form. 4. The transmission loss calculation is elaborated feeder wise in revised ER spread sheet.	3. The export data of feeders-2 of the month May 2011 has been correctly mentioned in the revised version of ER spread sheet and MR version 03 as per the export reading of Main Meter in the Form B statement. The export data of Feeder-1 of September 2011 was taken from check meter as it is mentioned in a note on B-form that the main meter export reading for September 2011 is less compared to the check meter reading due to problem identified in the main meter. Also the export reading of check meter was mentioned in the invoice of Feeder-1 for September 2011. Further the calibration for the main and check meter took place on 07/10/2013 and export data of Feeder-1 from October 2011 onwards was taken from Main meter as no difference is identified in the export reading of main and check meter. 4. The Transmission loss calculation is elaborated Feeder wise as in the case of Export and Import reading in the revised ER spread sheet. Also the Transmission loss value in the revised excel sheet is matching with the reading given in the

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
			Form B statement. Hence CL 2 is closed.
CAR 6: Following inadequacies are observed in the MR and emission reduction (ER) spreadsheet: 1. In section 3.2, in all the tables, section B.7.2 is referred which does not exist. 2. In section 4.4, year wise emission reduction is not provided. 3. The explanation of project emission (section 4.2) and leakage emission (section 4.3) is not elaborate and correct. 4. The formula of the parameter EGy/ $EG_{PJ,y}$ is not correct in section 4.1 5. The details of the monitoring system including the generation voltage and voltage level at which it is supplied to the Grid is not mentioned in the section 3.2/3.3.	Section 3.2, 3.3, 4.1, 4.2, 4.3 and 4.4 of VCS MR	1. The referred section details has been updated in revised MR version 03. 2. Year wise emission reduction has been provided in section 4.4 of the revised MR version 03. 3. The explanation of project emission and leakage emission is elaborated in the revised MR of version 03. 4. The formula of the parameter EGy has been updated in section 4.1 of revised MR version 03. 5. The generation voltage is 690 V and supplied voltage is 33 KV has been updated in the section 3.2 & 3.3 of the revised MR version 03.	1. In section 3.2 of the the revised MR, in all the tables, correct and applicable reference section has been provided. 2. In section 4.4 of the revised MR, year wise emission reduction is provided. 3. The explanation of project emission (section 4.2) and leakage emission (section 4.3) of the revised MR is now elaborate and correct. 4. The formula of the parameter EGy/ $EG_{PJ,y}$ is correct in section 4.1 of the revised MR. 5. The details of the monitoring system including the generation voltage and voltage level at which it is supplied to the Grid is now mentioned explicitly in the section 3.2 and 3.3 of the revised MR. Hence CAR 6 is closed.

APPENDIX II: <DOCUMENTS REFERRED DURING VERIFICATION AND VALIDATION OF THE PROJECT ACTIVITY>

// 1//	VCS Monitoring Report, version 03, dated 23/11/2013
// 2//	VCS Project Document, dated 22/11/2013 version 03
// 3//	Final CDM PDD registered with UNFCCC under CDM vide project reference no. 8303
// 4//	Validation report registered with UNFCCC under CDM with reference no. 8303
// 5//	Estimated Emission Reduction Calculation Sheet as per registered project reference no 8303
// 6//	VCS Monitoring report template Current Version: v3.3 Issued: 8 October 2013
// 7//	VCS Project description Template Current Version: v3.2 Issued: 8 October 2013
// 8//	Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4
// 9//	VCS Validation and Verification Manual Version 3.1 dated 8 October 2013
// 10//	Clean development mechanism validation and verification standard, Version 04 EB 74 Annex 04
// 11//	Host Country Approval Letter for the project activity vide reference No. 4/5/2012-CCC dated 14/09/2012
// 12//	Proof of registration as CDM Project activity http://cdm.unfccc.int/Projects/DB/DNV-CUK1353404982.34/view
// 13//	Commissioning certificate for all the WTGs of the proposed project activity dated 31/03/2011 and 21/05/2011.
// 14//	Power Purchase Agreements of the project activity signed between Chamudeswary Electricity Supply Corporation Limited (CESC) and Hindustan Zinc Limited dated 31/03/2011
// 15//	Form B statement based on JMR issued by CESC for the verification period (31/03/2011-30/11/2012)
// 16//	Invoice raised by Hindustan Zinc Limited to CESC for the verification period (31/03/2011-30/11/2012)
// 17//	Calibration certificates of all the main and check meters by KPTCL dated 19/03/2011
// 18//	Calibration certificates by CESC of the main meter having serial number 11068520 and check meter having serial number 11068533 dated 28/10/2011 which mentions that these meters were calibrated on 07/10/2011
// 19//	Calibration certificates by CESC of the main meters having serial number 11068516, 11068511 and 11068522 and check meters having serial number 11068503, 11068519 and 11068527 dated 30/07/2011 which mentions that these meters were calibrated on 25/07/2011
// 20//	Calibration certificates by CESC of the main meter having serial number 11068520 and check meter having serial number 11068533 dated 09/08/2012 which mentions that these meters were calibrated on 06/08/2012
// 21//	Calibration certificates by CESC of the main meters having serial number 11068516, 11068511 and 11068522 and check meters having serial number 11068503, 11068519 and 11068527 dated 18/12/2012 which mentions that these meters were calibrated on 15/12/2012
// 22//	Declaration from Hindustan Zinc Limited dated 10/11/2013 that there is no double counting of emission reduction claimed by the project activity under VCS and CDM simultaneously for the monitoring period (31/03/2011 to 30/11/2012) under consideration.

APPENDIX III: < LIST OF PERSONS INTERVIEWED >

List persons interviewed during the verification process or persons that contributed with other information that are not included in the documents listed above.

/1/	Mr. S Ramachandran	Operations-In-Charge, Suzlon Energy Limited
/2/	Mr. S. Dhamodran	Engineer, Suzlon Energy Limited
/3/	Mr. Vishnu Khandelwal	CDM Cell, Hindustan Zinc Limited

APPENDIX IV: <CURRICULA VITAE OF THE DOE'S VALIDATION AND VERIFICATION TEAM MEMBERS>

Ms. Sapana S. Pednekar - Team Leader

Bureau Veritas Certification (India), Lead Verifier - Climate change

She is a Post Graduate in Environmental Science from University of Pune, India and holds a PGDBA in Financial Management from Welinkars School of Management. She has total Industrial work experience of 8 years in the field of environmental studies of which more than 4 years experience is in the field of CDM and VCS. She is working in Bureau Veritas Certification (India) Pvt. Ltd. for last more than 2 years and has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of more than 30 CDM/ VCS project activities. She has undergone and successfully completed ISO 14001:2004 standard Lead Auditor Course and ISO 14064:2006 Standard Lead verifier course.

Pratik Bhattacharya– Team Member

Bureau Veritas Certification (India), Lead Verifier - Climate change

Graduate in Mechanical Engineering from Kavikulguru Institute of Technology and Science (Nagpur University) and Post graduate Diploma in Energy Management from Indian Institute of Social Welfare and Business Management (Calcutta University) and Certified Energy Auditor under Bureau of Energy Efficiency (Government of India, Ministry of Power). He has around 4 years of experience in System Designing (HVAC) and Energy Auditing. He has undergone intensive training on Clean Development Mechanism and Environment Management System. He is involved in validation and Verification of CDM and VCS projects activities.

Sanjay Patankar (Internal Technical Reviewer)

Bureau Veritas Certification (India) – Local Product Manager

He holds a Masters and Bachelors degree in Mechanical Engineering with over 20 years of work experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. He is working with Bureau Veritas Certification (India) Pvt. Ltd. as a Lead Auditor since last 2 years for ISO 9001, 14001 and OHSAS 18001 standards/specifications. He has undergone training related to Clean Development Mechanism and is currently involved in technical review, validation and verification of CDM project activities.