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# VERIFICATION AND CERTIFICATION REPORT

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**Vandana Vidhyut Limited**

**Rice Husk Based Power Project  
UN PA 0186**

**Monitoring Period 6: 01/04/2010 – 31/03/2011  
(Both days inclusive)**

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**SGS Climate Change Programme**

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<b>Date of Issue:</b>		<b>Project Number:</b>	
01/12/2011		CDM.VER0053 MP6	
<b>Project Title:</b>			
Rice Husk Based Power Project			
<b>Organisation:</b>		<b>Client:</b>	
SGS United Kingdom Limited		Vandana Vidhyut Limited	
<b>Publication of Monitoring Report:</b> 28/07/2011			
<b>Monitoring Period:</b>		01/04/2010 – 31/03/2011	
First Monitoring Report Version and Date:		Version 01 dated 22/07/2011	
Final Monitoring Report Version and Date:		Version 04 dated 18/11/2011	
<b>Summary:</b>			
<p>SGS United Kingdom Ltd has performed the periodic verification of the CDM project Rice Husk Based Power Project, UNFCCC Ref Number 0186. The verification includes confirming the implementation of the monitoring plan of the registered PDD UNFCCC reg. no.0186 and the application of the monitoring methodology as per AMS I.D version 7 dated 28 November 2005. A site visit was conducted to verify the data submitted in the monitoring report. SGS confirms the following has been reviewed;</p> <ul style="list-style-type: none"> <li>(a) The registered PDD, including the monitoring plan and the corresponding validation report;</li> <li>(b) Monitoring report, previous verification reports</li> <li>(c) The applied monitoring methodology;</li> <li>(d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;</li> <li>(e) All information and references relevant to the project activity's resulting in emission reductions</li> </ul> <p>The project activity is a rice husk based power generation project with provisions to co-fire coal with rice husk to maintain consistency in power generation. The total capacity of the power plant is 7.7MW. Entire power generated from the project activity is exported to the Chhattisgarh State Electricity Board (CSEB) Grid after meeting the auxiliary consumption of the power plant equipment, thus the equivalent amount of electricity is replaced from the grid generation mix, which would have generated from carbon intensive fossil fuel.</p> <p>SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in <b>28,376 tCO<sub>2</sub>e</b> emission reductions during period <b>01/04/2010 up to 31/03/2011</b>.</p>			
<b>Subject:</b>			
CDM Verification			
<b>Verification Team:</b>			
Shivaji Chakraborty – Lead Assessor/Team Leader/Local Assessor		<input checked="" type="checkbox"/> No Distribution (without permission from the Client or responsible organisational unit)	
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Date: 06-12-2011 Name: Sathis Kumar			
<b>Authorised Signatory:</b>		<input type="checkbox"/> Unrestricted Distribution	
Name: Siddharth Yadav Date: 13 December 2011			
<b>Revision Number:</b>	<b>Date:</b>	<b>Number of Pages:</b>	
0	20/09/2011	37	
1	18/10/2011	41	
2	22/10/2011	38	
3	18/11/2011	39	
4	01/12/2011	37	

## Abbreviations

BEs	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CERs	Certified Emission Reductions
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
COP/MOP	Conference of parties serving as the meeting of parties to Kyoto Protocol
CSEB	Chhattisgarh State Electricity Board
CSPDCL	Chhattisgarh State Power Development Corporation Limited
CSPTCL	Chhattisgarh State Power Transmission Corporation Limited
DGM	Deputy General Manager
DCS	Distributed Control System
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
FBC	Fluidized Bed Combustion
GHG	Green House Gas(es)
GCV	Gross calorific value
GWh	Giga Watt Hour
HT	High Tension
IPCC	Intergovernmental Panel on Climate Change
kV	Kilo Volt
kVA	Kilo Volt Ampere
kWh	Kilo Watt Hour
MR	Monitoring Report
MT	Metric Tonne
MW	Mega Watt
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCV	Net Calorific Value
PDD	Project Design Document
PEs	Project Emissions
PP	Project Participants
TPH	Tonne per hour
TPA	Tonne per Annum
T&D	Transmission and Distribution
UNFCCC	United Nations Framework Convention for Climate Change
VVL	Vandana Vidhyut Limited

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## 1. Introduction

### 1.1 Objective

SGS United Kingdom Ltd has been contracted by Vandana Vidhyut Limited to perform an independent verification of its CDM project Rice Husk Based Power Project. CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

### 1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

### 1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Rice Husk Based Power Project
UNFCCC Registration Number:	0186
Monitoring Period Covered in this Report:	01/04/2010 to 31/03/2011 (both days inclusive)
Project Participant (host):	Vandana Vidhyut Limited (India)
Location of the Project Activity:	Bilaspur / Raipur / Chhattisgarh /India

Vandana Vidhyut Limited has implemented a rice husk based 7.7 MW power project and the surplus power is being exported to CSEB grid after meeting in-house auxiliary demand. Coal is co-fired with rice husk to maintain consistency in power generation. The project activity involves operation of a 35 tonnes per hour (TPH) fluidized bed combustion type boiler with the outlet steam parameters of 66 kg/cm<sup>2</sup> and 500°C and a bleed-cum-condensing type 7.7 MW capacity turbo-generator for generation of power.

## 2. Methodology

### 2.1 General Approach

SGS' approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

### 2.2 Verification Team for this Assessment

Name	Role
Shivaji Chakraborty	Lead Assessor/Team Leader/Local Assessor
Sandeep Kurmi	Sectoral Scope Expert (TA 1.1)

Name	Role
Sathis Kumar	Technical Reviewer/Sectoral Scope Expert (TA 1.1)

### 2.3 Means of Verification

#### 2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

### 2.3.2 Site Visits

As part of the verification, the following on-site inspections have been carried out by all members of the assessment team.

<b>Location: Bilaspur/Raipur/Chattisgarh/India</b>	
<b>Date:</b> 16/08/2011 to 18/08/2011	
<b>Coverage:</b>	<b>Source of Information / Persons Interviewed</b>
Overall project planning, roles & responsibility for the designated project management team and Verification of monitoring and data handling procedure	Mr. Pankaj Baldua (AGM-Finance) Mr. S.R. Vajpae (Vice President-VVL) Mr. A K Mehta- GM Power Plant
Confirmation of data collection and handling procedures. Cross checking daily records, monthly records, audited annual report, emission reduction calculation, project emissions and leakage.	Mr. Sanjay Singh (Asst Manager-Operations) Mr. P.S Pujari (Asst Manager E&I) Mr. Vivek Singh (Executive- VVL) Mr. Sandeep
Assessment of project boundary, inspection of infrastructure and equipments, calibration, maintenance, personnel training. Detailed audit of project procedures, verification of implementation of monitoring procedures.	Mr. B.K.Gananayak (DGM Electrical & Instrumentation) Mr. Ajoy Kaushik (Sr. Chemist LAB-VVL) Mr. Ambrish Sukhla- Store Keeper-VVL

### 2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- II. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- III. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

Corrective Action Requests and Clarification requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and Observations.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period. Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

## **2.5 Internal Quality Control**

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.



### 3. Verification Findings

#### 3.1 Project Implementation - General

Vandana Vidhyut Limited has implemented a rice husk based 7.7 MW power project and the surplus power is being exported to CSEB grid after meeting in-house auxiliary demand. Coal is co-fired with rice husk to maintain consistency in power generation. The project activity involves operation of a 35 tonnes per hour (TPH) fluidized bed combustion type boiler with the outlet steam parameters of 66 kg/cm<sup>2</sup> and 500°C and a bleed-cum-condensing type 7.7 MW capacity turbo-generator for generation of power. Project was implemented and equipment installed as described in the registered PDD. The project documentation was found in compliance with the registered PDD<sup>1/</sup>. The project was registered with CDM EB on 09/02/2006 and the project meets the criteria for claiming credits for the monitoring period which starts from 01/04/2010 to 31/03/2011. This was checked from the UNFCCC website: <http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view>

The data and variables provided in the monitoring report are the same as stated in the registered PDD. An increase in 34.63% in the CERs as compared to the annual estimated CERs as per the registered PDD was noted in the MR. The PP was requested to justify such an increase in the ex-post emission reduction over the ex-ante calculation in accordance with the guideline of EB. Therefore **CAR #01** was raised.

The PP responded stating that in the registered PDD, the emission reductions for the entire crediting period were projected based on

- Baseline emissions corresponding to a net exportable electricity of 45.41 GWh to Chattisgarh State Electricity Board (CSEB) grid for the year 2002-2003 and
- Project emissions resulting from co-firing of 9784.9 tonnes of coal with rice husk in 2002-2003 and a total carbon content of 45% in coal.

In line with the registered monitoring plan, the emission reductions for the period 2010-2011 are calculated based on

- Baseline emissions corresponding to a net exported electricity of 54.46 GWh to CSEB grid for the year 2010-2011. The main reason for it was the increase in gross generation due to an increased quantity of rice husk and coal fired in comparison to the quantity fired in the year 2002-03 during the initial phase of the project. Further, the generation of 54.46 GWh is within the capacity of generation of 7.7 MW, i.e. with nearly 330 days of operation during the year 2010-2011, the plant has generated within the rated capacity and there has been a change in the gross generation as compared to the projected generation reported in 2002-03.
- Project emissions resulting from co-firing of 15088.417 tonnes of coal with rice husk in 2010-2011 and a total carbon content of coal (measured monthly) ranging between 22.90% to 35.10%

The above explanation signifies:

- (i) an increase in baseline emissions of 7436 tonnes CO<sub>2</sub> in 2010-2011 with respect to that in 2002-2003 (as provided in the registered PDD) which is attributed to an increase in net exported electricity to CSEB grid,
- (ii) an increase in project emissions by 136 tonnes CO<sub>2</sub> in 2010-2011 with respect to that in 2002-2003 (as provided in the registered PDD) which is attributed to a corresponding reduction in total carbon content of coal used.

The reasoning provided by the PP for the excess of CER as compared to the ex-ante scenario has been checked with the data monitored during the monitoring period.

The value of net electricity exported to the grid has been checked with the meter reading data and is found to be consistent. Further the total carbon content of coal has been cross checked with the test certificates and found to be consistent and thus accepted. Also, the amount of the project emission from the co-firing of coal with rice husk in 2010-2011 has been checked and found to be correct.

The PP's logic that due to the changes in the values of carbon content in coal and actual electricity supplied to the grid there is a difference in the ex-ante emission reduction and the actual emission reduction during the year 2010-2011. The logic was checked against the actual scenario seen during the site visit and the data provided for the duration 2010-2011 and found to be consistent thus accepted and therefore **CAR #01** was closed out.

During the verification site visit it was noted that there has been a change in the power (grid) evacuation system from the existing 11/33 kV to 11/132 kV and the installation of energy meters and the same has not been reported in the Monitoring report. The PP was requested to justify the same. The description of metering of the parameter as reported in the Monitoring report is not transparent. The PP was requested to clearly report the same. The PP was also requested to include a detailed line diagram of the electricity line. The energy meter details were not reported against the parameter Power Export in the Monitoring Report (CSPDCL HT Meter) and in-house export meter (SEMS Meter) hence **CAR #04** was raised.

In response, the PP clarified that the change of the power (grid) evacuation was not under the PP's control and was solely under the control of the CSPDCL (CSEB). In support the PP provided the documents evidencing the fact that the grid is not under the control of the PP. Also the PP provided justification that the boundary mentioned in the PDD has been found to be limited to the project activity and the grid is beyond the project boundary and as such there has been no such effect on the project due to the change. The letter from CSPDCL dated 02/07/2010 Ref No. CE/BR/Comml./HT/C-05/3584<sup>/27/</sup> intimating the change in the power (grid) evacuation system from 11/33 KVA line to 11/132 KVA line and the letter from CSPTCL Ref No.SE/T&C/BSP/466 dated 15/06/2010<sup>/28/</sup> stating that the energy meter details under the present configuration system was checked and found to be consistent. The change over from the existing 11/33 kV to 11/132 kV would not have any impact on the project activity as the grid had been found to be beyond the control of the PP and not included in the project boundary and as such would not affect the project activity. Further the changeover of the grid line from 11/33 KVA line to 11/132 KVA line does not fall within the project boundary and also is not under the control of the PP as the grid is sole authority of CSPDCL. The PDD has been registered under the methodology AMS I.D version 07 which does not require the grid to be part of the project boundary. Also, in the registered PDD, the grid falls beyond the project boundary and as such the change in the grid will not have any impact on the project design. Thus the justification provided by the PP was found to be acceptable. Details of the change of meters for the main meter and auxiliary meter dated 15/06/2010 after the change of grid was checked and found to be consistent and hence accepted. Monitoring Report version 02 dated 26/08/2011 was checked and the locations of the meters were found to be consistently reported and hence accepted and thus **CAR #04** closed out.

Corresponding to paragraph 200 to 203 of VVM 1.2, the assessment team is able to confirm that the monitoring has been carried out in accordance with the approved methodology AMS I.D version 7 which was applied to the project activity and monitoring plan contained in registered PDD. All the parameters used in calculation of net electricity supplied to regional grid by the project activity have been verified against monitoring plan and same in the monitoring report and found to be complete, consistent and correct.

### **3.2 Remaining Issues, CAR's, FAR's from Previous Validation or Verification**

There are no issues from the previous verification.

### **3.3 Compliance of the monitoring plan with the monitoring methodology.**

The project has been registered under the small scale approved baseline and monitoring methodology AMS I.D, "Grid connected renewable electricity generation," version 7 dated 28 November 2005. The monitoring of the project has been carried out in accordance with the methodology and the registered PDD. Neither a revision nor a deviation to the monitoring plan has been requested to the CDM Executive Board. This is inline with paragraph 191-195 of VVM version 1.2. For photographic evidences of all meters and monitoring and measuring devices clearly showing the serial numbers please refer to Section 11 of this verification report.

### 3.4 Completeness of Monitoring

Monitoring of the reductions in GHG emissions to result from the registered project have been implemented in accordance with the monitoring plan contained in the registered PDD. The monitoring mechanism is effective and reliable. The monitored parameters under project monitoring plan are in compliance with the registered PDD, the monitoring results of the parameters are as following:

#### Total Electricity Generated (kWh)

The total electricity generated is measured by in-house generation energy meter supplied by ABB. The energy meter reflects the serial number 02131300 and is calibrated by a third party (Yenkay Instruments and Controls Pvt. Ltd.) on a periodic basis (Calibration Certificate ref no YB/VVL/09-10/EM-02 dated 12/03/2010 and YB/VVL /2010-2011/EM-04 dated 27/01/2011)<sup>6/</sup>. The monitoring procedure of the total electricity generation along with calibration procedure of the monitoring equipment was found in line with the registered PDD. The meter is calibrated in a cycle of 1 year in accordance with the Registered Monitoring Plan by a third party NABL accredited laboratory and the accuracy class of the meter being high hence it can be inferred that the data reliability of the meter is high. Further the Data Management System was found appropriate and in place which was confirmed during the verification site visit and hence was concluded to be accurate.

The shift-in-charge records and log in the data and reports to the DGM (Operations). The data is also cross checked by the Manager, Electrical and Instrumentation who is responsible for maintaining the records of calibration of the instruments. The reports are finally reviewed by the General Manager (Power Plant). The total electricity generation figures have been checked with the plant energy reports and further cross checked with the DCS records during on site evaluation and found correct. All data for current monitoring period was checked during site visit and were found to be consistently reported and hence accepted.

#### Auxiliary Consumption (kWh)

The auxiliary consumption is measured by auxiliary energy meter in the plant premises to the best accuracy and is recorded, monitored on a continuous basis through DCS. The energy meter is supplied by GEC ALSTOM. The energy meter bears the serial number 7138950 and is calibrated by a third party (Yenkay Instruments and Controls Pvt. Ltd.) on a periodic basis (Calibration Certificate numbers: YB/VVL/09-10/EM-04 dated 23/03/2010)<sup>7/</sup>. There has been a change of meter for this parameter and the PP has provided the purchase order details PO No. VVL/BSP/Jan-08/045 dated 17/01/2008<sup>24/</sup> of purchase of meter in 2008. The initial test certificate of SEMS dated 30/01/2008<sup>26/</sup> was checked and found that on 21/01/2008 the initial test for the meter was done. Further the calibration of the meter prior to installation was checked and found to be consistent. The calibration of the previous meter was checked and found to be valid at the time of meter replacement. The new meter installed Type: Energy Meter Make: SEMS Serial number: MPU 02814 Accuracy class: +/- 0.55% Calibration frequency: Once in a year the date of the last calibration: 16/11/2010 Validity up to: 15/11/2011; Calibration done by CSPDCL dated 16/11/2010<sup>25/</sup>. The meter was installed on 29/11/2010 and the evidence of same was checked as the internal audit document which clearly mentions the meter change. A more accurate meter has been found to be in place of the old meter and as such the change was accepted. Also, the calibration of the meter was checked and found to be covering the entire monitoring period and hence accepted. The monitoring procedure of the auxiliary electricity consumption along with calibration procedure of monitoring equipment was found in line with the registered PDD. The meter is calibrated in a cycle of 1 year in accordance with the Registered Monitoring Plan by a third party NABL accredited laboratory and the accuracy class of the meter being high hence it can be inferred that the data reliability of the meter is high. Further the Data Management System was found appropriate and in place which was confirmed during verification site visit and hence was concluded to be accurate.

The shift-in-charge records and logs the data and reports to the DGM - Operations. The data is also cross checked by the Manager Electrical and Instrumentation who is responsible for maintaining the records of calibration of the instruments. The reports are finally reviewed by the Vice President- Power Plant.

#### Power Export (kWh)

The power export is measured by the Chhattisgarh State Electricity Board (CSEB) main meter (SEMS Export Meter (CSEB) -CSE 00046(till 14/06/2010) and Main Meter details: Type: Energy meter, Make: SEMS, Sl.

No.: CSE 40281(from 15/06/2010 after the change of grid from 11/33kV to 11/132kV) Accuracy class: 0.5 S  
There is a provision of cross checking the same against a check meter reading installed by the CSEB. Check meter details: Type: Energy Meter, Make: SEMS (ABT), Sl. No.: APM 08758, Accuracy class: 0.2 S (from 15/06/2010 after the change of grid from 11/33kV to 11/132kV) readings which is located at the Sirgitti Substation. All these meters are under the control of the grid authorities and are checked and sealed by CSEB. The maintenance and periodic calibration of the export meters are entirely under jurisdiction of CSEB and the project proponent does not have any control on the same. The same is calibrated by CSEB which was cross checked against the information provided in the monthly statements of CSEB from April 2010 to March 2011 and found to be consistent. The calibration dates as per the monthly statements of CSPDCL (earlier CSEB) are CSPDCL Statement dated 31/03/2010, CSPDCL Statement dated 30/04/2010, CSPDCL Statement dated 31/05/2010, CSPDCL Statement dated 21/06/2010 and 01/07/2010, CSPDCL Statement dated 31/07/2010, CSPDCL Statement dated 31/08/2010, CSPDCL Statement dated 30/09/2010, CSPDCL Statement dated 31/10/2010, CSPDCL Statement dated 30/11/2010, CSPDCL Statement dated 31/12/2010, CSPDCL Statement dated 31/01/2011, CSPDCL Statement dated 01/03/2011 and CSPDCL Statement dated 31/03/2011 respectively.

The net electricity export is also metered through an in-house energy meter bearing serial number TNB 00708, SEMS make is calibrated as per Calibration Certificate number YB/VVL/07-08/EM-01 dated 23/03/2010 and YB/VVL/07-08/EM-01 dated 21/03/2011<sup>18/</sup>. The in-house energy export meter is calibrated by a third party, Yenkey Instruments And Controls Pvt. Ltd which is a NABL certified laboratory on a regular basis as mentioned in the registered PDD and Monitoring Report. The in-house export meter reading by the power project is monitored and recorded on a continuous basis through DCS. The main meter being under the control of CSEB and the PP has no control over the same. Hence for any discrepancy noted it is imperative that the CSEB (the paying authority) against the net power exported to the state grid would take up appropriate action thereby ensuring the recalibration or replacement of the faulty meter. This is done to ensure the reliability of the parameter against which payment is done.

The emission reduction calculations are calculated based on the net electricity exported as metered by the Chhattisgarh State Electricity Board (CSEB) Main Meter, which is in line with the registered PDD and are therefore not affected by the in-house export meter readings. The power export values were cross checked with the monthly HT meter reading statements issued by Chhattisgarh State Electricity Board and found to be consistent.

#### Total Quantity of Coal Consumption (Tonnes)

The quantity of coal consumed is monitored by scaling of bunker (*i.e.* by measuring the difference in levels of coal in the bunker before feeding coal and after discharging the same into the feeding hoppers of the FBC boiler). A standardized scaling chart for the bunker is used to monitor the fuel fed from the bunker to the FBC boiler. The monitoring procedure of the total quantity of coal consumption was found in line with the registered PDD, page 39. The scaling of bunker was carried out by VVL which was certified by Power Tech Engineers Consulting Engineers. The bunker capacity certificate (Bunker capacity certificates by Power Tech Engineers Consulting Engineers Ref: VVL-SK-16-10dated 09/02/2011 done on 06/02/2011 and VVL-SK-16-10 dated 06/02/2010.)<sup>9/</sup> has been cross checked, which certifies the capacity for coal bunkers as 172.170M<sup>3</sup> and 172.228M<sup>3</sup> respectively for the two bunkers.

The data for the quantity of coal consumption is monitored on hourly as well as on daily basis through on-site measurements and recorded under coal stock register<sup>11/</sup>. The annual coal consumption value is also subjected to financial audit carried out by the independent statutory auditors and annual coal consumption value is also provided under company's annual audited report<sup>15/</sup>.

The coal consumption values have been cross checked with the coal stock register<sup>11/</sup> and audited annual report of the company<sup>15/</sup> and found correct.

#### Total Quantity of Rice Husk Consumption (Tonnes)

The quantity of rice husk consumed is monitored by scaling of bunker (*i.e.* by measuring the difference in levels of rice husk in the bunker before feeding the husk and after discharging the same into the feeding hoppers of the FBC boiler). A standardized scaling chart for the bunker is used to monitor the fuel fed from

the bunker to the FBC boiler. The monitoring procedure of the total quantity of rice husk consumption was found in line with the registered PDD, page 38. The scaling of the bunker was carried out by VVL which was certified by Power Tech Engineers Consulting Engineers. The bunker capacity certificate (Bunker capacity certificates by Power Tech Engineers Consulting Engineers Ref: VVL-SK-16-10 dated 09/02/2011 done on 06/02/2011 and VVL-SK-16-10 dated 06/02/2010.)<sup>/9/</sup> has been cross checked, which certifies the capacity for rice husks 172.150 m<sup>3</sup> and 172.220 m<sup>3</sup> respectively for the two bunkers.

The data for the quantity of rice husk consumption is monitored on hourly as well on daily basis through on-site measurements and captured under Rice Husk Stock Register<sup>/12/</sup>. The annual rice husk consumption value is also subjected to financial audit carried out by the independent statutory auditors and annual audited rice husk consumption value is also provided in company's annual audited report<sup>/15/</sup>.

The rice husk consumption values have been cross checked with the rice husk stock register and audited annual report of the company and found correct.

Annual biomass assessment report<sup>/17/</sup> for the current monitoring period as per requirement of EB 28 Annex 35<sup>/20/</sup>, was made available initially which has been conducted by Power Tech Consulting Engineers, Bilaspur (April 2011). The same has been checked and was found to be consistent and the amount of biomass in the region is in excess of the required amount. The rice husk requirement of VVL is projected at only 12.40% of the total biomass availability in the region which is in line with the guideline of EB 47 Annex 28<sup>/21/</sup> which requires the availability of biomass; 25% in excess of the total biomass requirement as specified during ex-ante estimation of amount of biomass required to ensure year round availability of the biomass. Hence the report was considered to be acceptable in line with the EB requirement. The PP has demonstrated in the report stated above, that the quantity of biomass (rice husk) available in the region far exceeds the total requirement to run the power plant year round. As per the biomass assessment report conducted by Power Tech Consulting Engineers, Bilaspur, the total availability of biomass in the region is 568,796 TPA. The total requirement of VVL is 70,000 TPA and total demand of the region including for VVL is 396,000 TPA. Thus an additional of 172,796 TPA of biomass is available.

Thus amount of biomass in excess after consumption by the project and after meeting the other demands in the region is 172,796 TPA. Thus the total availability is 43.63% in excess of the total demand of the region and far exceeds the 25% excess requirement as per the guideline of EB 47 Annex 28. The same has been checked and found to be consistent and hence accepted.

#### Calorific Value of Rice Husk (kCal/kg)

The calorific value of the rice husk is determined by in the in-house laboratory of VVL as per the standard national practices by taking random samples of the rice husk. The bomb calorimeter (Advance Research Instruments Corporation, Model: BCM/ Serial No. 21018) used for the purpose is calibrated internally once a year following standard calibration procedure (The calibration is carried out in accordance with the manufacturer specification which is the standard national practice for in-house calibration of the Bomb Calorimeter)<sup>/22/</sup> as provided by Advance Research Instruments Manual for bomb calorimeter which is checked against the calibration certificate dated 10/06/2009 and 10/06/2010 respectively and found to be satisfactory. The calibration is carried out in accordance with the manufacturer specification which is the standard national practice for in-house calibration of the Bomb Calorimeter.

The calorific value of the rice husk is monitored for the purpose of calculation of plant heat rate and efficiency of power generation as per the monitoring plan of the registered PDD and the same is not required for the calculation of the emission reduction. The monthly rice husk calorific values<sup>/4/</sup> have been cross checked with the in-house laboratory reports<sup>/13/</sup> and found to be correct.

#### Plant Heat Rate (kCal/kWh)

The plant heat rate is the operational parameter of the power plant which is monitored as per the monitoring plan of the registered PDD. The plant heat rate is calculated based on the duly monitored total power generation value, rice husk consumption, coal consumption values and respective calorific values of rice husk and coal. The plant heat rate actually is not required for calculation of the emission reductions. It is



required to determine the efficiency of power generation. The calculation of plant heat rate in the emission reduction calculation sheet has been checked and found justified.

#### Efficiency of power generation (%):

The efficiency of power generation is the operational parameter of the power plant which is monitored as per the monitoring plan of the registered PDD. It is calculated based on the values of plant heat rate. The efficiency of power generation is also not required for calculation of emission reductions. The calculation of efficiency of power generation in the emission reduction calculation sheet has been checked and found to be justified.

The PP was requested to maintain consistency in terms of the parameter name in the Monitoring Report as per the Registered PDD. The PP was requested to justify the usage of unit for the emission factor in the emission reduction calculation in line with the registered PDD and thus **CAR #02** was raised. In response, the PP provided the revised MR which was checked and the names of the parameters were found to be consistent with the PDD hence accepted. The revised excel sheet for emission reduction was checked and the unit of the CO<sub>2</sub> emission factor for the project was found to be in line with page 32 of the registered PDD and hence accepted. Further the PP was requested to clarify the reported frequency of parameter Plant Heat Rate and Efficiency of Power Generation in monitoring report. The PP was requested to justify how it was in line with the registered monitoring plan. The PP was asked to clarify why data for the entire period has not been provided in the excel sheet as per the registered monitoring plan. In response, the PP clarified that the entire data as per the frequency of monitoring mentioned in the registered PDD and has been included in the revised excel sheet version 03 and MR Version 04 dated 18/11/2011. The documents were checked and the data was found to be completely reported for the parameter correctly. The same was checked with the daily log books and found to be consistently reported in the excel sheet as per requirement of EB48 report 68 para 10(a)iii and thus **CAR #02** was closed out.

During the site visit, the calibration tag on the meter of Gross Electricity Generation was found to be valid till 12/03/2011. The PP was requested to clarify the inconsistency with regard to the calibration of the meter and also account for the same as per the guideline for delayed calibration. **CAR #03** was raised.

In response, the PP provided the calibration certificates for the meter Sr. no. 02131300 which was checked and found to be consistent. Further, the duration of calibration was checked and was found to be covering the current monitoring period. The photograph of the revised tag on the meter was checked and based on the photographic confirmation, it was concluded that the calibrating agency had erroneously missed the tagging of the meter. The corrective action had been already done from the PP's end and as such **CAR #03** was closed out.

The PP was requested to clarify the inconsistency in the values of the parameter Export to CSEB (As per the in-house Export Meter of SEMS) vis-à-vis the Export to CSEB Grid (As per CSEB Statement) for the month of April 2010. The in house export meter value is found to be on a much higher side as compared to the Export to CSEB grid. The PP was requested to clarify why the values of the Export to CSEB (As per the in-house Export Meter of SEMS) is lower than the value of Export to CSEB Grid (As per CSEB Statement) for the months of May, June, August, October, December, and February. **CL #05** was raised.

In response the PP clarified that the reading of the in-house export meter is taken on a daily basis. The daily readings of the in-house export meter are taken at 6 AM while the monthly readings of the CSEB export meter (CSEB HT Meter) are taken at any time on the last day of the month or the first day of the next month. This difference between the time of recording of these two meter readings attributes to the differences (although significantly small) between the in-house export meter readings and CSEB export meter readings. However, the baseline emissions are computed based on the CSEB HT Meter readings, which are lower than the in-house meter readings, if looked from the whole year's perspective. The same is found to be same for all the months mentioned above. The logic provided with regard to the consideration of the net electricity exported to the grid as recorded by the CSEB export meter is found to be consistent. Further the same has been cross checked with the estimation of emission reduction excel sheet and found to be consistent and hence acceptable. Hence **CL #05** was closed out.

All the above parameters have been verified on the basis of paragraphs 196-198 of VVM 1.2.

### 3.5 Accuracy of Equipment

The metering equipment for monitoring the parameter: Power export (CSEB- HT Meter) is located at the sub-station where the meter reading taken is in the custody of the CSEB. Based on this meter reading CSEB statement for power export to the grid is generated which in turn forms the basis of emission reduction calculation. The metering equipment is duly approved, tested, and sealed by CSEB. This was verified at the sub-station during the site visit. As per registered PDD frequency of meter calibration is annual and calibration certificates provided for current monitoring period revealed that meters are calibrated in accordance with the monitoring plan by CSEB. This has been cross checked with the CSEB from April 2010 to March 2011 and found to be consistent. The calibration dates as per the monthly statements of CSPDCL Statement dated 31/03/2010, CSPDCL Statement dated 30/04/2010, CSPDCL Statement dated 31/05/2010, CSPDCL Statement dated 21/06/2010 and 01/07/2010, CSPDCL Statement dated 31/07/2010, CSPDCL Statement dated 31/08/2010, CSPDCL Statement dated 30/09/2010, CSPDCL Statement dated 31/10/2010, CSPDCL Statement dated 30/11/2010, CSPDCL Statement dated 31/12/2010, CSPDCL Statement dated 31/01/2011, CSPDCL Statement dated 01/03/2011 & CSPDCL Statement dated 31/03/2011 respectively were found consistent.

All measuring and monitoring devices have been calibrated by external agencies (NABL certified labs) and by CSEB and found to be capable to meet the monitoring purposes. The accuracy of all such equipment has been maintained within specified limits. Calibration details of monitoring instruments have been provided in subsequent section of this report.

The assessment team is able to confirm that the management system of the project is in place, with the assigned responsibilities properly identified based on monitoring plan in registered PDD the key parameters being measured and reviewed periodically as per the procedures. This was checked during the site visit and found to be consistent.

### 3.6 Accuracy of Emission Reduction Calculations

The total emission reductions in the monitoring report for the period 01/04/2010 to 31/03/2011 is higher than the values projected in the registered PDD. The reported values adopted for the calculation of emission reductions (Power export, Coal consumption and Carbon content of the coal) have been cross checked with reference to the CSEB-HT meter reading reports<sup>/10/</sup> coal stock register/ audited company Annual report, Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011, accredited external laboratory monthly test reports<sup>/14/</sup> respectively and found correct. The monitoring procedures<sup>/1/</sup> for power export, coal consumption and carbon content of the coal are completely consistent with the registered PDD.

The difference in values of ex post monitored parameter (total carbon content of coal as monitored during the current monitoring period) from the values considered for estimation of the ex-ante emission reduction as presented in the registered PDD has resulted in the difference in the total CER reported. The conservative *ex ante* estimate of emission reductions for the entire crediting period was based on 45% total carbon content. The 'F' Grade Indian coal (used for the project activity) has a maximum of 45% total carbon). This has been cross checked with the South Eastern Coalfields Limited (SECL/RGH/CQM/ACCT/10-11/4908/0799 dated 06/10/2010<sup>/8/</sup> and found to be consistent. Furthermore, samples of ultimate analysis conducted by Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period from 01/04/2010- 31/03/2011<sup>/14/</sup> with coal samples used in the project activity substantiate that the coal that is co-fired in the project activity has a total carbon content in the range between 22.90% to 35.10%. The coal receipts from the South Eastern Coalfields Limited were verified which state that the coal used is 'F' grade and considered accepted. Thus the ex-post monitored emission reduction value for the monitoring period 01/04/2010 to 31/03/2011 was found to be acceptable by the assessment team. Further the explanation of this is included in **CAR #01** in section 3.1 of this report.

The response to CARs was satisfactory and thus was closed. The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'.

The data involved in emission reduction calculation has been thoroughly verified with plant records and found satisfactory. The details of the reported and the verified values for all parameters are listed in section 4. The calculation of emission reductions is found to be correct.

### 3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the emission reductions are discussed in section 3.4 above. All the data recorded is in compliance with the monitoring report.

### 3.8 Management System and Quality Assurance

The company has a dedicated team comprising of members having long standing experience in the said field of operations. The shift-in-charge records and logs the data and reports to the DGM (Operations). The data is also cross checked by the Manager (Electrical and Instrumentation) who is responsible for maintaining the records of calibration of the instruments. The reports are finally reviewed by the General Manager (Power Plant). The internal audits are being conducted at regular intervals to ensure control to keep the plant operational without any disturbance.

There is a defined procedure<sup>/23/</sup> on "GHG Performance Monitoring, Measurement and Reporting of Data" which ensures that proper corrective actions are undertaken immediately if any discrepancies are identified in the generation, consumption and export figures (like inconsistencies in reported parameters) and/or discrepancies in the operation of the power plant. Therefore the assessment confirms that the management system for the CDM project is in place, with the responsibilities properly identified.

In order to verify data quality, the company involves in the project works in accordance with a quality assurance procedure, Procedure for Monitoring Plan Implementation, which establishes the operational and management structure implemented.

### 3.9 Data from External Sources

-Grid Emission Factor used for emission reduction calculation has been determined *ex ante* on the basis of power sector values provided by CEA, Ministry of Power, Government of India and the value is fixed for the entire crediting period. The value of the Grid emission factor 0.820 kgCO<sub>2</sub> /kWh has been cross checked and found to be consistent with the value mentioned at page number 32 of the registered PDD<sup>/1/</sup>

-Carbon content in Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011<sup>/14/</sup> monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range 22.90% to 35.10%. These have been cross checked with respective monthly ultimate coal analysis laboratory reports and found satisfactory.

-Calorific Value of Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011<sup>/14/</sup> monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2175 to 3490 kCal/kg, which has been cross checked with the respective monthly ultimate coal analysis laboratory reports and found to be satisfactory.



#### 4. Calculation of Emission Reductions

Parameter	Reported Value		Verified Value	
	01/04/2010 to 31/03/2011		01/04/2010 to 31/03/2011	
Power Export (kWh)	Apr-10	34960	Apr-10	34960
	May-10	4897440	May-10	4897440
	Jun-10	4731920	Jun-10	4731920
	Jul-10	5019360	Jul-10	5019360
	Aug-10	5189040	Aug-10	5189040
	Sep-10	4882800	Sep-10	4882800
	Oct-10	4983600	Oct-10	4983600
	Nov-10	4926720	Nov-10	4926720
	Dec-10	5190000	Dec-10	5190000
	Jan-11	4725840	Jan-11	4725840
	Feb-11	4858800	Feb-11	4858800
	Mar-11	5020080	Mar-11	5020080
	Total	<b>54460560</b>	Total	<b>54460560</b>
Coal Consumption (Tonnes)	Apr-10	22.175	Apr-10	22.175
	May-10	1266.787	May-10	1266.787
	Jun-10	1185.988	Jun-10	1185.988
	Jul-10	1347.517	Jul-10	1347.517
	Aug-10	1359.594	Aug-10	1359.594
	Sep-10	1273.86	Sep-10	1273.86
	Oct-10	1272.107	Oct-10	1272.107
	Nov-10	1279.291	Nov-10	1279.291
	Dec-10	2180.238	Dec-10	2180.238
	Jan-11	1228.387	Jan-11	1228.387
	Feb-11	1204.93	Feb-11	1204.93
	Mar-11	1467.543	Mar-11	1467.543
	Total	<b>15088.417</b>	Total	<b>15088.417</b>
Carbon content of coal (%)	Apr-10	29.7	Apr-10	29.7
	May-10	33.9	May-10	33.9
	Jun-10	28.2	Jun-10	28.2
	Jul-10	25.7	Jul-10	25.7
	Aug-10	31.2	Aug-10	31.2
	Sep-10	26.4	Sep-10	26.4
	Oct-10	29.0	Oct-10	29.0
	Nov-10	35.0	Nov-10	35.0
	Dec-10	35.1	Dec-10	35.1
	Jan-11	22.9	Jan-11	22.9
	Feb-11	26.3	Feb-11	26.3
	Mar-11	26.1	Mar-11	26.1
Grid Emission factor (kgCO <sub>2</sub> /kWh) <sup>EE</sup>	0.820		0.820	
Total Electricity Generated (KWh)	Apr-10	156600.00	Apr-10	156600.00
	May-10	5460300.00	May-10	5460300.00
	Jun-10	5095600.00	Jun-10	5095600.00
	Jul-10	5783300.00	Jul-10	5783300.00
	Aug-10	5785500.00	Aug-10	5785500.00
	Sep-10	5490800.00	Sep-10	5490800.00
	Oct-10	5530900.00	Oct-10	5530900.00

<b>Parameter</b>	<b>Reported Value</b> 01/04/2010 to 31/03/2011		<b>Verified Value</b> 01/04/2010 to 31/03/2011	
	Nov-10	5514200.00	Nov-10	5514200.00
	Dec-10	5752600.00	Dec-10	5752600.00
	Jan-11	5294800.00	Jan-11	5294800.00
	Feb-11	5194700.00	Feb-11	5194700.00
	Mar-11	5792400.00	Mar-11	5792400.00
	Total	<b>60851700.0</b>	Total	<b>60851700.00</b>

<b>Parameter</b>	<b>Reported Value</b> 01/04/2010 to 31/03/2011		<b>Verified Value</b> 01/04/2010 to 31/03/2011	
Auxiliary Consumption (KWh)	Apr-10	21700.00	Apr-10	21700.00
	May-10	561100.00	May-10	561100.00
	Jun-10	516150.00	Jun-10	516150.00
	Jul-10	593650.00	Jul-10	593650.00
	Aug-10	589000.00	Aug-10	589000.00
	Sep-10	565750.00	Sep-10	565750.00
	Oct-10	570400.00	Oct-10	570400.00
	Nov-10	564940.00	Nov-10	564940.00
	Dec-10	596030.00	Dec-10	596030.00
	Jan-11	557450.00	Jan-11	557450.00
	Feb-11	526950.00	Feb-11	526950.00
	Mar-11	596220.00	Mar-11	596220.00
	Total	<b>6259340.00</b>	Total	<b>6259340.00</b>
Rice Husk Consumption (Tonnes)	Apr-10	179.933	Apr-10	179.933
	May-10	6268.427	May-10	6268.427
	Jun-10	5854.846	Jun-10	5854.846
	Jul-10	6633.437	Jul-10	6633.437
	Aug-10	6630.178	Aug-10	6630.178
	Sep-10	6303.444	Sep-10	6303.444
	Oct-10	6355.007	Oct-10	6355.007
	Nov-10	4742.212	Nov-10	4742.212
	Dec-10	5758.352	Dec-10	5758.352
	Jan-11	7860.543	Jan-11	7860.543
	Feb-11	6999.734	Feb-11	6999.734
	Mar-11	6590.897	Mar-11	6590.897
	Total	<b>70177.01</b>	Total	<b>70177.01</b>
Calorific Value of Rice Husk (kCal/kg)	Apr-10	3168	Apr-10	3168
	May-10	3254	May-10	3254
	Jun-10	3266	Jun-10	3266
	Jul-10	3242	Jul-10	3242
	Aug-10	3187	Aug-10	3187
	Sep-10	3142	Sep-10	3142
	Oct-10	3168	Oct-10	3168
	Nov-10	3095	Nov-10	3095
	Dec-10	3108	Dec-10	3108
	Jan-11	3174	Jan-11	3174
	Feb-11	3206	Feb-11	3206
	Mar-11	3230	Mar-11	3230
Calorific Value of Coal (kCal/kg)	Apr-10	2855	Apr-10	2855
	May-10	3195	May-10	3195
	Jun-10	2635	Jun-10	2635
	Jul-10	2320	Jul-10	2320
	Aug-10	2800	Aug-10	2800
	Sep-10	2450	Sep-10	2450
	Oct-10	2745	Oct-10	2745
	Nov-10	3430	Nov-10	3430
	Dec-10	3490	Dec-10	3490
	Jan-11	2175	Jan-11	2175
	Feb-11	2315	Feb-11	2315
	Mar-11	2280	Mar-11	2280

<b>Parameter</b>	<b>Reported Value</b>		<b>Verified Value</b>	
	01/04/2010 to 31/03/2011		01/04/2010 to 31/03/2011	
Plant Heat Rate (kCal/kWh)	Apr-10	4044.30	Apr-10	4044.30
	May-10	4476.83	May-10	4476.83
	Jun-10	4365.92	Jun-10	4365.92
	Jul-10	4259.13	Jul-10	4259.13
	Aug-10	4310.30	Aug-10	4310.30
	Sep-10	4175.42	Sep-10	4175.42
	Oct-10	4271.38	Oct-10	4271.38
	Nov-10	3457.46	Nov-10	3457.46
	Dec-10	4433.82	Dec-10	4433.82
	Jan-11	5216.65	Jan-11	5216.65
	Feb-11	4856.98	Feb-11	4856.98
	Mar-11	4252.92	Mar-11	4252.92
Efficiency of power generation (%)	Apr-10	21.26	Apr-10	21.26
	May-10	19.21	May-10	19.21
	Jun-10	19.70	Jun-10	19.70
	Jul-10	20.19	Jul-10	20.19
	Aug-10	19.95	Aug-10	19.95
	Sep-10	20.60	Sep-10	20.60
	Oct-10	20.13	Oct-10	20.13
	Nov-10	24.87	Nov-10	24.87
	Dec-10	19.40	Dec-10	19.40
	Jan-11	16.49	Jan-11	16.49
	Feb-11	17.71	Feb-11	17.71
	Mar-11	20.22	Mar-11	20.22

Grid emission factor used for emission reduction calculation is determined ex-ante, as mentioned under registered PDD.

- Total Baseline Emissions = Power Export to CSEB Grid \* Grid emission Factor  
= 54460560 kWh \* 0.820 kgCO<sub>2</sub>/kWh  
= 44658 tCO<sub>2</sub>.
- Total Project Emissions = (44/12) \* Quantity of Coal consumed \* Carbon content of coal  
= 16282tCO<sub>2</sub>.
- Emission Reductions = Total Baseline Emissions – Project Emissions  
= (44658-16282) tCO<sub>2</sub>  
= **28,376tCO<sub>2</sub>**.



## **5. Recommendations for Changes in the Monitoring Plan**

No recommendation was provided to the client to improve their monitoring plan.

## 6. Overview of Results

### Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

*Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.*

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

*Yes. All members of the assessment team visited the sites and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.*

*The results of the site visits are recorded in the verification checklist which is used as an internal report only.*

*The evidence has been checked and collected. The revised monitoring report is attached with this verification report.*

Has data from additional sources been used? If yes, please detail the source and significance.

*The baseline emission factor for grid electricity is fixed ex-ante and the value (0.820 kgCO<sub>2</sub>/kWh) has been cross checked with in the same as mentioned in page 32 of the registered PDD (UN ref. no. 0186) and found to be satisfactory.*

*Carbon content in Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range 22.90% to 35.10% which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found satisfactory.*

*The Calorific Value of Coal is analysed by Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2175 to 3490 kCal/kg, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found to be satisfactory.*

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

*Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.*

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

*No recommendation was provided to the Client to change the Monitoring methodology.*

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation

procedures consistent with those contained in the registered project design document and the monitoring plan.

*The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 21076.2 tCO<sub>2</sub> for the period 01/04/2010 to 31/03/2011 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 28376 tCO<sub>2</sub> for the same period. Clarification for such a difference was provided in section 3.6.*

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

*No such non conformity of the actual project activity and its operation with the registered project design document has been observed.*

Post monitoring report on UNFCCC website

*Yes, the monitoring report is available at ref. UNFCCC Project Reference Number 0186 on UNFCCC website*

<http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view>

## 7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by Vandana Vidhyut Limited to perform the verification of the emission reductions reported for the CDM project "Rice Husk Based Power Project" UNFCCC Ref Number 0186 in the period 01/04/2010 – 31/03/2011.

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Monitoring Report Version 04 dated 18/11/2011.

The management of the Vandana Vidhyut Limited is responsible for the preparation, calculation and determination of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 04 dated 18/11/2011. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/04/2010 – 31/03/2011 based on the reported emission reductions in the Monitoring Report version 04 dated 18/11/2011 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Rice Husk Based Power Project
UNFCCC Reference Number:	0186
Registered PDD used for Verification:	Registered PDD – "Rice Husk based Power Project" Version and Date of the registered PDD is not available
Methodology Used for Verification:	AMS I.D version 07, dated 28 November 2005
Applicable Period:	01/04/2010 to 31/03/2011
Total GHG Emission Reductions Verified:	28,376tCO <sub>2e</sub>

**Signed on behalf of the Verification Body by Authorized Signatory**

Signature:



Name: Siddharth Yadav

Date: 13 December 2011



## 8. Document References

/1/	Registered PDD – “Rice Husk based Power Project”, UN Ref. 0186 <a href="http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view">http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view</a>												
/2/	Monitoring Report version 01, dated 22/07/2011												
/3/	Monitoring Report version 02, dated 26/08/2011 Monitoring Report version 03, dated 10/10/2011 Monitoring Report version 04, dated 18/11/2011 <table><tr><th>MR version &amp; Date</th><th>Date of Revision</th><th>Main changes reason for Revision</th></tr><tr><td>Monitoring Report version 02</td><td>26/08/2011</td><td>Use of correct emission factor, inclusion of line diagram, typographical errors correction</td></tr><tr><td>Monitoring Report version 03</td><td>10/10/2011</td><td>Correct reporting of all meter changes for Gross Electricity.</td></tr><tr><td>Monitoring Report version 04</td><td>18/11/2011</td><td>Changes in calculation frequency as per monitoring plan for Plant Heat Rate and Efficiency</td></tr></table>	MR version & Date	Date of Revision	Main changes reason for Revision	Monitoring Report version 02	26/08/2011	Use of correct emission factor, inclusion of line diagram, typographical errors correction	Monitoring Report version 03	10/10/2011	Correct reporting of all meter changes for Gross Electricity.	Monitoring Report version 04	18/11/2011	Changes in calculation frequency as per monitoring plan for Plant Heat Rate and Efficiency
MR version & Date	Date of Revision	Main changes reason for Revision											
Monitoring Report version 02	26/08/2011	Use of correct emission factor, inclusion of line diagram, typographical errors correction											
Monitoring Report version 03	10/10/2011	Correct reporting of all meter changes for Gross Electricity.											
Monitoring Report version 04	18/11/2011	Changes in calculation frequency as per monitoring plan for Plant Heat Rate and Efficiency											
/4/	Emission reduction calculation spreadsheet, version 01& Emission reduction calculation spreadsheet, version 02 & Emission Reduction calculation spreadsheet version 03												
/5/	Plant Records for the entire period of 2010 – 2011.												
/6/	Calibration certificates of Gross energy meter – YB/VVL/09-10/EM-02 dated 12/03/2010 and YB/VVL/2010-2011/EM-04 dated 27/01/2011.)												
/7/	Calibration certificates of Auxiliary energy meter – YB/VVL/09-10/EM-04 dated 24/03/2010 and YB/VVL/2010-2011/EM-03 dated 23/03/2011.												
/8/	Coal invoice from the South Eastern Coalfields Limited (SECL/RGH/CQM/ACCT/10-11/4908/0799 dated 06/10/2010												
/9/	Bunker capacity certificates by Power Tech Engineers Consulting Engineers Ref: VVL-SK-16-10 dated 09/02/2011 done on 06/02/2011 and VVL-SK-16-10 dated 06/02/2010.												
/10/	<u>CSEB-HT monthly meter reading statements for the entire period of 2010 – 2011:</u> CSPDCL Statement dated 31/03/2010, CSPDCL Statement dated 30/04/2010, CSPDCL Statement dated 31/05/2010, CSPDCL Statement dated 21/06/2010 and 01/07/2010, CSPDCL Statement dated 31/07/2010, CSPDCL Statement dated 31/08/2010, CSPDCL Statement dated 30/09/2010, CSPDCL Statement dated 31/10/2010, CSPDCL Statement dated 30/11/2010, CSPDCL Statement dated 31/12/2010, CSPDCL Statement dated 31/01/2011, CSPDCL Statement dated 01/03/2011 & CSPDCL Statement dated 31/03/2011 respectively												
/11/	Monthly Coal Stock Registers for the entire period of 2010 – 2011.												
/12/	Monthly Rice Husk Stock Registers for the entire period of 2010 – 2011.												
/13/	In-house laboratory records for analysis of rice-husk for the period 2010-2011.												
/14/	Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.10/P/28, Report No.10/P/53[A], Report No 10/P/53[B], Report No. 10/P/53[C], Report No. 10/P/79[A], Report No. 10/P/79[B], Report No. 10/P/79[C], Report No. 10/P/107, Report No. 11/P/25[A], Report No.11/P/25[B], Report No. 11/P/25[C] and Report No 11/P/25[D] over the period of time from April 2010- March 2011												
/15/	Audited Annual Report for FY 2010 – 2011												
/16/	Internal Audit Reports 05/07/2011, 04/10/2010, 04/01/2011 & 05/04/2011												
/17/	Biomass Assessment Report (2010-2011), prepared by M/s. Power Tech Consulting												

	Engineers, dated June 2011
/18/	Calibration Certificate number YB/VVL/07-08/EM-01 dated 23/03/2010 and YB/VVL/07-08/EM-01 dated 21/03/2011, SEMS make Sr. No: TNB 00708
/19/	Power Interruption details for the year 2010-2011
/20/	EB 28 Annex 35,
/21/	EB 47 Annex 28
/22/	In-house procedure for Calibration of Bomb Calorimeter as per the manual.
/23/	Defined procedure on "GHG Performance Monitoring, Measurement and Reporting of Data"
/24/	PO No. VVL/BSP/Jan-08/045 dated 17/01/2008
/25/	Calibration of meter number MU02814 dated 16/11/2010 by CSPDCL.
/26/	SEMS initial test certificate dated 30/01/2008
/27/	CSPDCL dated 02/07/2010 Ref No. CE/BR/Comml./HT/C-05/3584
/28/	CSPTCL Ref No.SE/T&C/BSP/466 dated 15/06/2010
/29/	Methodology AMS I.D version 07
/30/	Validation Report of UN PA 0186 <a href="http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view">http://cdm.unfccc.int/Projects/DB/SGS-UKL1135954820.19/view</a>
/31/	Verification Reports of previous monitoring periods <a href="http://cdm.unfccc.int/UserManagement/FileStorage/L4XTP8E3SK7FQBNZ6AOIMJ910YGVHD">http://cdm.unfccc.int/UserManagement/FileStorage/L4XTP8E3SK7FQBNZ6AOIMJ910YGVHD</a>
/32/	Validation and Verification Manual 1.2 EB 55 Annex 1

## 9. Findings Overview

### Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	04	01	00

Date:	18/08/2011		Raised by:	Shivaji Chakraborty / Sandeep Kurmi	
Type:	CAR	Number:	01	Reference:	AU4 - Section 2 sub section 4.6 /Section 5 CER Calculation

**Lead Assessor Comment:** **Date:** 18/08/2011

An increase in 34.63% in the CERs as compared to the annual estimated CERs as per the registered PDD has been noted. The PP is hereby required to justify such increase in the post-ex emission reduction over the ex-ante calculation in accordance with the guideline of EB.

**Project Participant Response:** **Date:** 26/08/2011

In the registered PDD, the emission reductions for the entire crediting period were projected based on

- Baseline emissions corresponding to a net exportable electricity of 45.41 GWh to Chattisgarh State Electricity Board (CSEB) grid for the year 2002-2003 and
- Project emissions resulting from co-firing of 9784.9 tonnes of coal with rice husk in 2002-2003 and a total carbon content of 45% in coal.

In line with the registered monitoring plan, the emission reductions for the period 2010-2011 are calculated based on

- Baseline emissions corresponding to a net exported electricity of 54.46 GWh to CSEB grid for the year 2010-2011. The main reason for it was the increase in gross generation due to an increased quantity of rice husk and coal fired in comparison to the quantity fired in the year 2002-03 during the initial phase of the project. Further, the generation of 54.46 GWh is within the capacity of generation of 7.7 MW, i.e. with nearly 330 days of operation during the year 2010-2011, the plant has generated within the rated capacity and there has been a change in the gross generation as compared to the projected generation reported in 2002-03.
- Project emissions resulting from co-firing of 15088.417 tonnes of coal with rice husk in 2010-2011 and a total carbon content of coal (measured monthly) ranging between 22.90% to 35.10%

The above explanation signifies:

- (i) an increase in baseline emissions of 7436 tonnes CO<sub>2</sub> in 2010-2011 with respect to that in 2002-2003 (as provided in the registered PDD) which is attributed to an increase in net exported electricity to CSEB grid,
- (ii) an increase in project emissions by 136 tonnes CO<sub>2</sub> in 2010-2011 with respect to that in 2002-2003 (as provided in the registered PDD) which is attributed to a corresponding reduction in total carbon content of coal used.

This justifies an increase in emission reductions for the period 2010-2011 by 7300 tonnes of CO<sub>2</sub> with respect to that projected in the registered PDD.

**Documentation Provided as Evidence by Project Participant:**

*Monitoring Report Version 02 dated 26/08/2011*

**Information Verified by Lead Assessor:**

*Monitoring Report Version 02 dated 26/08/2011*

**Reasoning for not Acceptance or Acceptance and Close Out:**

<p>The reasoning provided by the PP for the excess CER as compared to the ex-ante scenario has been checked with the data monitored during the monitoring period.</p> <p>The value of net electricity exported to the grid has been checked with the meter reading data and found to be consistent. Further the total carbon content of coal has been checked with the test certificates and found to be consistent. Hence accepted. Also, the amount of project emission from co-firing of coal with rice husk in 2010-2011 has been checked and found to be correct.</p> <p>The PP has provided logic that due to the changes in the values of carbon content in coal and actual electricity supplied to the grid there is a difference in the ex-ante emission reduction and the actual emission reduction during the year 2010-2011. The logic has been cross checked against the actual scenario seen during the site visit and the data provided for the duration 2010-2011 and found to be consistent. Hence the same was accepted. CAR 01 was closed out.</p>	
<b>Acceptance and Close out by Lead Assessor: Closed</b>	<b>Date: 05/09/2011</b>

Date:	18/08/2011	Raised by:	Shivaji Chakraborty / Sandeep Kurmi		
Type:	CAR	Number:	02	Reference:	AU4 – Section 2
<b>Lead Assessor Comment:</b>				<b>Date:</b> 18/08/2011	
The PP is requested to maintain consistency in terms of parameter name in the Monitoring Report as per the Registered PDD.					
The PP is requested to justify the usage of unit for the emission factor in the emission reduction calculation in line with the registered PDD.					
<b>Project Participant Response:</b>				<b>Date:</b> 26/08/2011	
The necessary editing and corrections have been made in the Monitoring Report Version 02.					
In the Emission Reduction sheet, the value of 820 tonnes of CO <sub>2</sub> /Million units was mentioned. However, the same has been converted and changed to 0.820 Kg CO <sub>2</sub> /KWh as per page 32 of the Registered PDD. The value of 0.820 Kg CO <sub>2</sub> /KWh has been obtained by dividing 820 tonnes of CO <sub>2</sub> /Million units by 1000. It is to be noted that since it is just a change in the units and not the value, the value of the emission reductions resulting from the project activity remain unchanged. The necessary changes are being reflected in the Excel sheet “ER_VVL_VF_06_Ver02.xlsx.”					
<b>Documentation Provided as Evidence by Project Participant:</b>					
The Monitoring Report version 02 and the emission reduction sheet “ER_VVL_VF_06_Ver02.xlsx.”					
<b>Information Verified by Lead Assessor:</b>					
The Monitoring Report version 02 and the emission reduction sheet “ER_VVL_VF_06_Ver02.xlsx.”					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
The revised MR was checked and the names of the parameters were found to be consistent with the PDD hence accepted. The revised excel sheet for emission reduction was checked and the unit of the CO <sub>2</sub> emission factor for the project was found to be in line with page 32 of the registered PDD and hence accepted.					
Please clarify why the emergency procedures, organisational structure , roles and responsibilities, line diagram defined under section C of MR has been removed?					
<b>Acceptance and Close out by Lead Assessor: Open</b>				<b>Date:</b> 08/10/2011	
<b>Project Participant Response:</b>				<b>Date:</b> 18/10/2011	
The emergency procedures, organisational structure, roles and responsibilities, line diagram has been suitably included in Section C of the Monitoring Report Version 03. It was accidentally left out and has been suitably included.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
MR version 03 dated 10/10/2011					
<b>Information Verified by Lead Assessor:</b>					
MR version 03 dated 10/10/2011					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					

The revised MR was checked and found to be in line with the requirement of the monitoring procedures like emergency procedure, organisational structure, roles and responsibilities. Line diagram has been correctly incorporated in section C of the report and hence accepted.					
Efficiency of power generation activity-					
As per registered PDD recording frequency - Continuous (per hour) but final MR (Ref: cell "Measuring/ Reading/Recording frequency) says it's not applicable.					
Plant Heat Rate-					
As per registered PDD recording frequency - Continuous (per hour) but MR says it's not applicable					
Please clarify in monitoring report how this parameter is monitored in line with registered MP? CAR #02 remains open					
<b>Acceptance and Close out by Lead Assessor: Open</b>				<b>Date:</b> 16/11/2011	
<b>Project Participant Response:</b>				<b>Date:</b> 18/11/2011	
The PP would like to state both the efficiency of power generation activity and the plant heat rate are calculated parameters. However, the same is being recorded continuously (on an hourly basis). It was erroneously left out in Version 03 of the Monitoring Report. The MR version 04 has been duly updated with the same.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
MR version 04 dated 18/11/2011					
<b>Information Verified by Lead Assessor:</b>					
MR version 04 dated 18/11/2011					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
The MR version 04 dated 18/11/2011 was checked and found to be consistent in terms of reporting the frequency of calculation of the parameter Efficiency of power generation activity & Plant Heat Rate. These parameters are calculated hourly and reported daily. Though these parameters are calculated based on monitored parameters, they are not used in emission reduction calculation.					
However PP is requested to report the values of the parameter in the excel sheet and MR as per the frequency of the parameters mentioned in the MR as per EB 48 para 68 para 10(a) iii.					
<b>Acceptance and Close out by Lead Assessor: Open</b>				<b>Date:</b> 24/11/2011	
<b>Project Participant Response:</b>				<b>Date:</b> 30/11/2011	
The Excel sheet titled, "ER_VVI_VF06_Ver03.xls" has been duly updated. The PP has incorporated the values of the gross electricity generation, coal consumption and biomass consumption on an hourly basis. Thus the calculation of plant heat rate and power plant efficiency has also been put on a hourly basis.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
The Excel sheet titled, "ER_VVI_VF06_Ver03.xls"					
<b>Information Verified by Lead Assessor:</b>					
The Excel sheet titled, "ER_VVI_VF06_Ver03.xls"					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
The revised excel sheet version 03 was checked and found to be reporting the parameters of gross electricity generation, coal consumption and biomass on hourly basis. The parameters were found to be reported in line with the registered monitoring plan and hence accepted.					
<b>Acceptance and Close out by Lead Assessor: Closed</b>				<b>Date:</b> 01/12/2011	

Date:	18/08/2011	Raised by:	Shivaji Chakraborty / Sandeep Kurmi		
Type:	CAR	Number:	03	Reference:	AU4 Section 2 (3.5).
<b>Lead Assessor Comment:</b>				<b>Date:</b> 18/08/2011	
During site visit, the calibration tag on the meter of Gross Electricity Generation was found to be valid till 12/03/2011. The PP has to clarify the inconsistency with regard to the calibration of the meter and also account for the same as per the guideline for delayed calibration.					
<b>Project Participant Response:</b>				<b>Date:</b> 26/08/2011	
The Gross Electricity Generation is being metered by the Energy Meter (Type: ABB P+). The calibration of the same was done on 12/03/2010 and 27/01/2011. The calibration certificates have been provided to the DOE. Hence, there is no inconsistency in the calibration of the meter and the dates cover the entire span of the current Monitoring Period, i.e., 1st April 2010 and 31 <sup>st</sup> March 2011.					
The Meter was calibrated on the above mentioned date, and the calibrating agency had erroneously not put the tag of calibration on the energy meter. However, the calibrating agency, Yenkey Instruments and Controls Pvt. Ltd. has replaced the old tag with the new tag. The meter now shows the calibration date of 27/01/2011.					

<b>Documentation Provided as Evidence by Project Participant:</b>	
The calibration certificates of the Gross Electricity Generation meter dated 12/03/2010 and the 27/01/2011. The calibration has been performed by Yenkey Instruments and Controls Pvt. Ltd. The photograph of the energy meter after the tag was removed and the new tag has been put.	
<b>Information Verified by Lead Assessor:</b>	
The calibration certificates of the Gross Electricity Generation meter YB/VV/09-10/EM-01 dated 12/03/2010 and YB/VVL/2010-2011/EM-04 dated 27/01/2011. The calibration has been performed by Yenkey Instruments and Controls Pvt. Ltd. The photograph of the energy meter after the tag was removed and the new tag	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
<p>The calibration certificates for the meter Sr. no. 02131300 was checked and found to be consistent. Further, the duration of calibration was checked and was found to be covering the current monitoring period. The meter calibration was found to be consistently done. The photograph of the revised tag on the meter was checked and based on the photographic confirmation, it was concluded that the calibrating agency had erroneously missed the tagging of the meter.</p> <p>It is not clear from the description provided for the parameter "Power Export as per Chhattisgarh State Power Distribution Company limited (CSPDCL) HT Meter Reading statement" whether the calibration details are mentioned in the monthly statement from CSEB? Also for the same parameter there is change in meter compared to previous MP. It is not transparently reported in MR, when this new meter was installed, what is the accuracy class of the new meter compared to old meter?. What was the previous meter used and its details. Pls give all the information as transparently provided for the auxiliary meter. Also the accuracy class of the check meter is more than the accuracy class of the main meter. The month and year of CSEB statements from July to December are of 2011 instead of 2010.</p> <p>Why the net export meter available at VVL premises in previous monitoring period is removed in this monitoring period?</p> <p>For the parameter 'Total quantity of coal consumption' please include bunker certificate details</p> <p>Please clarify why coal is not part of the project boundary in section A.4 of MR?</p>	
<b>Acceptance and Close out by Lead Assessor: Open</b>	<b>Date: 08/10/2011</b>
<b>Project Participant Response:</b>	<b>Date: 18/10/2011</b>
<p>The PP would like to state that the calibration of the export meter is beyond the control of the project proponent. CSEB has the full control over the maintenance of the meter. On the day of the month when the reading is taken, the meter is sealed and calibrated. The same is mentioned in the statements which are issued from the CSEB.</p> <p>The PP would like to clearly state that according to the Registered PDD, only the main meter is to be considered for taking the energy reading and subsequently calculating the emission reductions. The check meter has been installed by the CSEB just for its own cross-checking purpose and the PP does not have any control over it. Since, the Main meter and the Check meter are located side by side, the PP decided to include its relevant details in the Monitoring Report. Further, the accuracy class of the main meter is 0.5 s which has been used for the project activity.</p> <p>The details of the previous meter which was used for monitoring the net electricity fed to the grid have been suitably mentioned in the Monitoring Report. The PP has submitted its installation certificate to the DOE and included the necessary details in the Monitoring Report Version 03. The accuracy class of the new meter as well as the old meter was 0.5 s.</p> <p>The months and year of CSEB Statements have been modified to 2010 in place of 2011 in the requisite places. It was a typographical error in the Monitoring Report Version 02, and the Monitoring Report Version 03 has been updated accordingly.</p> <p>According to the Registered PDD, the PP is not required to mention the net in-house meter reading. The PP is required to monitor the Gross Energy meter, the auxiliary meter and the export meter located at the sub-station of CSEB. Further, the PP would like to state that the meter under consideration is under the control of CSEB. Vandana Vidhyut Limited, the Project Proponent has no control over the same. However, the same has been mentioned in Section C (Description of the Monitoring System) of the Monitoring Report Version 03. 'Total quantity of coal consumption', the bunker certificate details and its calibration has been suitably included.</p> <p>Coal has been included in the Project Boundary in the Monitoring Report Version 03.</p>	
<b>Documentation Provided as Evidence by Project Participant:</b>	
MR version 03 dated 10/10/2011	
<b>Information Verified by Lead Assessor:</b>	



MR version 03 dated 10/10/2011	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
The justification from the PP that the calibration of the export meter is beyond the control of the PP and is under the jurisdiction of CSEB which is found to be correct and hence accepted. The corrections to be MR with regard to the change of meter has been checked and found to be consistent and hence accepted. Thus CAR #03 was closed out.	
<b>Acceptance and Close out by Lead Assessor: Closed</b>	<b>Date: 18/10/2011</b>

Date:	18/08/2011	Raised by:	Shivaji Chakraborty / Sandeep Kurmi		
Type:	CAR	Number:	04	Reference:	AU4 –Section 2 (1, 3.3 & 3.4);

<b>Lead Assessor Comment:</b>	<b>Date: 18/08/2011</b>
<ul style="list-style-type: none"> <li>During the verification site visit it has been noted that there has been a change in the power evacuation system from the existing 11/33 kV to 11/132 kV and the installation of energy meters and the same has not been reported in the Monitoring report. The PP is hereby required to justify the same.</li> <li>The description of metering of the parameter as reported in the Monitoring report is not transparent. PP is hereby requested to clearly report the same. The PP has to include a detailed line diagram of the electricity line.</li> <li>The energy meter details have not been reported against the parameter Power Export in the Monitoring Report (CSPDCL HT Meter) and in-house export meter (SEMS Meter). PP is hereby requested to provide justification for the same.</li> </ul>	

<b>Project Participant Response:</b>	<b>Date: 26/08/2011</b>
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<ul style="list-style-type: none"> <li>As per the registered PDD, “the project boundary is from the point of fuel supply to the point of power export to the grid where the project proponent has a full control. Thus boundary covers fuel storage and processing, boiler, steam-turbine generator and all other accessory equipments.” This shows that the power evacuation system is not part of the project boundary; any changes to the power evacuation system will not have any impact on the emission reduction quantum of the project activity. The PDD is based on the methodology AMS- I D/Version 07, where the grid falls beyond the project boundary. Moreover, the project boundary has been described in page 25 of the Registered PDD, which shows the project configuration. Hence the change in the power evacuation system was not mentioned in the Monitoring Report.</li> </ul>	
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The details of the three meters (Auxiliary meter, and the export meter located at the CSEB sub-station is as follows).

SI No.	Meter name	Meter details
1	Auxiliary Meter (Under VVL's control)	Make : SEMS SI.No- MPU02814
2	Export Main Meter (Under CSEB control) located at sub-station	Make : SEMS SI.No- CSE 40281
3	Export Check Meter (Under CSEB control) located at sub-station	Make : SEMS SI.No- APM 08758

<ul style="list-style-type: none"> <li>The monitoring of the respective points has been included in Section C of the Monitoring Report version 02.</li> <li>The details of the energy meter located at the sub-station (CSEB) have been incorporated in the Monitoring Report Version 02.</li> </ul>	
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<b>Documentation Provided as Evidence by Project Participant:</b>
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Monitoring Report Version 02.
The Test certificate for the Auxiliary meter dated 16/11/2010 from CSPTCL.
The letter from CSPDCL dated 02.07.2010 intimating the change in the power evacuation system from 11/33 KVA line to 11/132 KVA line.
The letter from CSPTCL stating the energy meter details under the present configuration system.

<b>Information Verified by Lead Assessor:</b>
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<p>Monitoring Report Version 02 dated 26/08/2011</p> <p>The Test certificate for the Auxiliary meter dated 16/11/2010 from CSPTCL.</p> <p>The letter from CSPDCL dated 02/07/2010 Ref No. CE/BR/Comml./HT/C-05/3584 intimating the change in the power evacuation system from 11/33 KVA line to 11/132 KVA line.</p> <p>The letter from CSPTCL Ref No.SE/T&amp;C/BSP/466 dated 15/06/2010 stating the energy meter details under the present configuration system.</p>					
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <p>The letter from CSPDCL dated 02/07/2010 Ref No. CE/BR/Comml./HT/C-05/3584 intimating the change in the power evacuation system from 11/33 KVA line to 11/132 KVA line and the letter from CSPTCL Ref No.SE/T&amp;C/BSP/466 dated 15/06/2010 stating the energy meter details under the present configuration system was checked and found consistent. The change over from existing 11/33 kV to 11/132 kV would not have any impact on the project activity as the grid has been found to be beyond the control of the PP and not included in the project boundary and as such would not affect the project activity. Thus the justification provided by the PP is accepted. Details of the change of meters for the auxiliary meter dated 16/11/2010 was checked and found to be consistent and hence accepted. Monitoring Report version 02 dated 26/08/2011 was checked and the locations of the meters were found to be consistently reported and hence accepted. CAR #04 closed out.</p>					
<p><b>Acceptance and Close out by Lead Assessor: Closed</b></p>			<p><b>Date:</b> 05/09/2011</p>		

Date:	18/08/2011		Raised by:	Shivaji Chakraborty / Sandeep Kurmi	
Type:	CL	Number:	05	Reference:	AU4 Section 3 / ER Excel sheet

<p><b>Lead Assessor Comment:</b></p> <p>The PP has to clarify the inconsistency in the values of the parameter Export to CSEB (As per the in-house Export Meter of SEMS) vis-à-vis the Export to CSEB Grid (As per CSEB Statement) for the month of April 2010. The in house export meter value is found to be on a much higher side as compared to the Export to CSEB grid.</p> <p>PP has to clarify why the values of the Export to CSEB (As per the in-house Export Meter of SEMS) is lower than the value of Export to CSEB Grid (As per CSEB Statement) for the months of May, June, August, October, December, January and February.</p>			<p><b>Date:</b> 18/08/2011</p>		
<p><b>Project Participant Response:</b></p> <p>The reading of the in-house export meter is taken on a daily basis. Generally, the daily readings of the in-house export meter are taken at 6 AM while the monthly readings of the CSEB export meter (CSEB HT Meter) are taken at any time on the last day of the month or the first day of the next month. This difference between the time of recording of these two meter readings attributes to the differences (although significantly small) between the in-house export meter readings and CSEB export meter readings. However, the baseline emissions are computed based on the CSEB HT Meter readings, which are lower than the in-house meter readings, if looked from the whole year's perspective. The same is found to be true for all the months mentioned above.</p>					
<p><b>Documentation Provided as Evidence by Project Participant:</b></p> <p>CSEB HT Meter Readings for Months from April 2010 to March 2011.</p>					
<p><b>Information Verified by Lead Assessor:</b></p> <p>CSEB HT Meter Readings for Months from April 2010 to March 2011.</p>					
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <p>The logic provided with regard to the consideration of the net electricity exported to the grid as recorded by the CSEB export meter is found to be consistent. Further the same has been cross checked with the estimation of emission reduction excel sheet and found to be consistent and hence acceptable. Hence CL #05 was closed out.</p>					
<p><b>Acceptance and Close out by Lead Assessor: Closed</b></p>			<p><b>Date:</b> 05/09/2011</p>		



## 10. Statement of Competence

### Statement of Competence

Name: Shivaji Chakraborty

#### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

#### Scopes of Expertise

##### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.2 Energy generation from renewable energy sources

##### 2. Energy Distribution

x

Technical Area(s): TA 2.1 Electricity distribution  
TA 2.2 Heat distribution

##### 3. Energy Demand

x

Technical Area(s): TA 3.1 Energy Demand

##### 4. Manufacturing

Technical Area(s):

##### 5. Chemical Industry

Technical Area(s):

##### 6. Construction

Technical Area(s):

##### 7. Transport

Technical Area(s):

##### 8. Mining/Mineral Production

Technical Area(s):

##### 9. Metal Production

Technical Area(s):

##### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

##### 11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

##### 12. Solvent Use

Technical Area(s):

##### 13. Waste Handling and Disposal

Technical Area(s):

##### 14. Afforestation and Reforestation

Technical Area(s):

##### 15. Agriculture

Technical Area(s):

Approved Member of Staff by: Siddharth Yadav Date: 17/11/2011

## Statement of Competence

Name: Sandeep Kurmi

### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

### Scopes of Expertise

#### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.

#### 2. Energy Distribution

Technical Area(s):

#### 3. Energy Demand

x

Technical Area(s): TA 3.1 Energy Demand

#### 4. Manufacturing

x

Technical Area(s): TA 4.n Other then 4.1-4.4

#### 5. Chemical Industry

Technical Area(s):

#### 6. Construction

Technical Area(s):

#### 7. Transport

Technical Area(s):

#### 8. Mining/Mineral Production

Technical Area(s):

#### 9. Metal Production

Technical Area(s):

#### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

#### 11. Fugitive Emissions from Production and

Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

#### 12. Solvent Use

Technical Area(s):

#### 13. Waste Handling and Disposal

Technical Area(s):

#### 14. Afforestation and Reforestation

Technical Area(s):

#### 15. Agriculture

Technical Area(s):

Approved Member of Staff by: Siddharth Yadav

Date: 14/01/2011

## Statement of Competence

Name: Sathis Kumar

### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

### Scopes of Expertise

#### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar  
TA 1.2 Energy generation from renewable energy sources

#### 2. Energy Distribution

x

Technical Area(s): TA 2.1 Electricity distribution  
TA 2.2 Heat distribution

#### 3. Energy Demand

x

Technical Area(s): TA 3.1 Energy Demand

#### 4. Manufacturing

Technical Area(s):

#### 5. Chemical Industry

Technical Area(s):

#### 6. Construction

Technical Area(s):

#### 7. Transport

Technical Area(s):

#### 8. Mining/Mineral Production

Technical Area(s):

#### 9. Metal Production

Technical Area(s):

#### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

#### 11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

#### 12. Solvent Use

Technical Area(s):

#### 13. Waste Handling and Disposal

Technical Area(s):

#### 14. Afforestation and Reforestation

Technical Area(s):

#### 15. Agriculture

Technical Area(s):

Approved Member of Staff by: Siddharth Yadav Date: 01/08/2011

## 11. Photographic Evidence

Unique reference number: 02131300

Name of equipment: ABB Energy Meter

Parameter: Total Electricity Generated (kWh)

Date: 17/08/2011



Unique reference number: 7138950/ MPU02814

Name of equipment: Alstom Energy Meter/SEMS

Parameter: Auxiliary Consumption (kWh)

Date: 19/10/2010 & 17/08/2011



(Meter Photograph on 19/10/2010)

(Meter Photograph on as seen on site on 17/08/2011)

Unique reference number: CSE 00046 /CSE 40281  
Name of equipment: SEMS Export Meter (CSEB)

Parameter: Power Export (kWh)  
Date: 17/08/2011



(Meter Photograph on 10/04/2010)



(Meter Photograph on as seen on site)

Unique reference number: BCM/21018  
Name of equipment: Advance Research Instrument Corporation – Bomb Calorimeter

Parameter: Calorific Value of Rice Husk (kCal/kg)  
Date: 17/08/2011



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