
VERIFICATION AND CERTIFICATION REPORT

Vandana Vidhyut Limited

Rice Husk Based Power Project

SGS Climate Change Programme

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Summary:			
<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"> (a) The registered PDD, including the monitoring plan and the corresponding validation report; (b) Monitoring report, previous verification reports (c) The applied monitoring methodology; (d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board; (e) All information and references relevant to the project activity's resulting in emission reductions <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 Chattisgarh 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 28,555 tCO₂e emission reductions during period 01/04/2008 up to 31/03/2009.</p>			
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CDM Verification			
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Abbreviations

BEs	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
COP/MOP	Conference of parties serving as the meeting of parties to Kyoto Protocol
CSEB	Chattisgarh State Electricity Board
DGM	Deputy General Manager
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
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
MR	Monitoring Report
MT	Metric Tonne
MW	Mega Watt
NCV	Net Calorific Value
PDD	Project Design Document
PE	Project Emissions
PP	Project Participant
TPH	Tonne per hour
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:	UN 0186
Monitoring Period Covered in this Report	01/04/2008 to 31/03/2009
Project Participants	Vandana Vidhyut Limited.
Location of the Project Activity:	Bilaspur/Raipur/Chattisgarh/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/cm² 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
Sanjay Banerjee	Lead Assessor
Sanjay Banerjee	Local Assessor
Shivaji Chakraborty	Assessor
Shivaji Chakraborty	Expert- Scope 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 the assessment team

Location: Bilaspur/Raipur/Chattisgarh/India	
Date: 09/04/2010 & 10/04/2010	
Coverage:	Source of Information / Persons Interviewed
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. PS Pujari (Asst Manager E&I)
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

The project was implemented and equipment installed as described in the registered PDD. The project documentation was found in compliance with the registered PDD^{1/}. The project was registered with CDM EB on 09/02/2006 and the project meets the criteria for claiming credits for the monitoring period 01/04/2008 to 31/03/2009. 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 the estimates of the emission reductions in the current monitoring period as per the final version of the Monitoring Report as compared to the estimated yearly emission reductions as specified in the registered PDD has been noted. The reported emission reduction in the current monitoring period from 01/04/2008 to 31/03/2009 is 28,555 tCO₂e; while the estimated emission reduction in the registered PDD is 21076.2 tCO₂e. This emission reduction value reported in the monitoring report is 35.46% more than the value mentioned in the registered PDD. Hence a **CAR 05** was raised.

The PP clarified 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 2008-2009 are calculated based on

- Baseline emissions corresponding to a net exported electricity of 57.686 GWh to CSEB grid for the year 2008-2009 and
- Project emissions resulting from co-firing of 18723.140 tonnes of coal with rice husk in 2008-2009 and a total carbon content of coal (measured monthly) ranging between 21.80% and 31.90%.

The above explanation signifies:

- (i) an increase in baseline emissions of 10,080 tonnes CO₂ in 2008-2009 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) a marginal increase in project emissions of 2601 tonnes CO₂ in 2008-2009 with respect to that in 2002-2003 (as provided in the registered PDD) which attributes to an increase in coal consumption but a corresponding reduction in total carbon content of coal used.

The reasoning provided by the PP for the excess CERs as compared to the ex-ante scenario has been checked with the data monitored during the current monitoring period which is 01/04/2008 to 31/03/2009. The value of net electricity exported to the grid has been checked against the meter reading of the CSEB monthly HT meter reading statement from April 2008 to March 2009 with the recorded meter reading data and found to be consistent. Hence the net electricity exported to grid by Vandana Vidyut Limited was found to be of the value of 57.686 GWh which was accepted.

Further the total carbon content of coal has been checked against the test certificates (Ref: Central Institute of Mining and Fuel Research, Bilaspur Unit^{14/} Report No.08/P/28, Report No.08/P/59[A], Report No.08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No.09/P/27 over the period April 2008- March 2009) and was found to be consistent hence it was accepted. The range of carbon

content in coal varied from 21.80% to 31.90% which can be considered as a reason for the change in the project emission figures for the current monitoring period. Further, the amount of project emissions from co-firing of coal with rice husk in 2008-2009 has been checked and was found to be correct.

The 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 as specified in the registered PDD and the actual emission reduction during the current monitoring period from 01/04/2008 to 31/03/2009 was found to be correct. The logic has been cross checked against the actual scenario seen during the site visit and the data provided for the duration of the current monitoring period and was found to be consistent, hence accepted. **CAR 05** was closed out.

Corresponding to paragraph 199 to 202 of VMM 1.1, the assessment team is able to confirm that 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 the 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 was 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 with 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 190-194 of VVM version 1.1. For all photographic evidences of all meters and monitoring and measuring devices clearly showing the serial number please refer to Section 11 of this verification report below.

3.4 Completeness of Monitoring

Monitoring of 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 bears the serial number 02131300 and is calibrated by a third party (Yenkay Instruments and Controls Pvt. Ltd.) on a periodic basis. (Calibration Certificate ref nos YB/VVL/07-08/EM-02 dated 24/03/2008 and YB/VVL/2008-09/M-07 dated 24/03/2009)^{6/}. The monitoring procedure of the total electricity generation along with the 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 to be appropriate and in place which was confirmed during the verification site visit and hence was concluded to be "best 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 were found to be correct.

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 ref no YB/VVL/07-08/EM-03 dated 24/03/2008 and YB/VVL/2008-09/EM-04 dated 24/03/2009)^{/7/}. 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 the verification site visit and hence was concluded to be "best 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.

The auxiliary electricity consumption values for the current monitoring period from 01/04/2008 to 31/03/2009 as represented in MR Version 01 dated 22/03/2010^{/2/} were not matching with the actual metered data available in the plant log sheets, thus **CAR 04** was raised for clarification of such data discrepancy.

In Monitoring Report Version 01, the data for auxiliary consumption of the rice husk based power plant were based on the difference between the gross generation meter readings and the in-house export meter readings. In response to **CAR 04**, the PP rectified the auxiliary electricity data in revised monitoring report and made the correction with reference to the metered auxiliary consumption data available in daily plant log sheets. The rectified auxiliary electricity consumption figures have been checked with the plant daily reports for the period April 2008 to March 2009 and were found to be correct. It may be noted that the auxiliary consumption of the power plant is not required for the computation of emission reductions from the project activity. Thus the change in the auxiliary consumption data had no impact on the emission reduction figures. Therefore **CAR 04** was closed out as the same was rectified in Monitoring Report Version 02^{/3/}.

Power Export (kWh)

The power export is measured by the Chhattisgarh State Electricity Board (CSEB) main meter (SEMS Export Meter (CSEB) -CSE 00046 readings. There is a provision of cross checking the same against a check meter reading installed by the CSEB. All these meters are checked and sealed by CSEB. The maintenance and periodic calibration of the export meters are entirely under jurisdiction of CSEB and the PP does not have any control on the same.

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 24/03/2008 and YB/VVL/2008-09/M-06 dated 24/03/2009^{/18/}. 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 was 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 (MS/PTE/09/23 dated 10/02/2009)^{/9/} has been cross checked, which certifies the capacity for coal bunkers as 172.170M³ and 172.228M³ respectively for the two bunkers.

The data for the quantity of coal consumption is monitored on daily basis through on-site measurements and recorded under coal stock register^{/11/}. 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^{/15/}.

The coal consumption values have been cross checked with the coal stock register^{/11/} and audited annual report of the company^{/15/} and were found to be 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 bunker was carried out by VVL which was certified by Power Tech Engineers Consulting Engineers. The bunker capacity certificate (ref no MS/PTE/09/23 dated 10/02/2009^{/9/}) has been cross checked, which certifies the capacity for rice husks 172.170M³ and 172.228M³ respectively for the two bunkers.

The data for the quantity of rice husk consumption is monitored on daily basis through on-site measurements and captured under Rice Husk Stock Register^{/12/}. 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^{/15/}.

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

Annual biomass assessment report^{/17/} for the current monitoring period as per requirement of EB 28 Annex 35^{/20/}, was made available initially which has been conducted by Power Tech Consulting Engineers, Bilaspur (June 2009). 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 biomass availability in the region which is in line with the guideline of EB 47 Annex 28^{/21/} which requires the availability of biomass to the tune of 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.

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)^{/22/} as provided by Advance Research Instruments Manual for bomb calorimeter which is checked

and was 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 calculation of the emission reduction. The monthly rice husk calorific values ^{/4/} have been cross checked with the in-house laboratory reports ^{/13/} and were 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 was found to be sufficiently 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 was found to be sufficiently justified.

However, it was observed that the efficiency of power generation has decreased by 5% during 2008-2009 when compared to the last monitoring period from 1st April 2007 – 31st March 2008. This decrease in the efficiency is due to the rise in the plant heat rate during the year 2008-2009. In the year 2007-2008 the increase of power generation efficiency was mainly due to regular plant operation technical measures (such as cleaning of cooling tower condenser tube, change of bed coils and economiser coils of the boiler, repairing and replacement of boiler safety valves and start up valve, repairing of high pressure valves both at boiler and turbine side, repairing of air box) as carried out during 2007-2008 along with that fewer interruptions were experienced at the state grid 33 kV feeder line ^{/19/} in comparison to previous year. This has been verified during the site visit along with the documentary evidences ^{/19/}. Further the parameter efficiency of power generation has no impact like the Plant Heat Rate on the emission reduction calculation and hence the decrease in 2008-2009 would further have no impact on the emission reduction.

All the above parameters have been verified on the basis of paragraphs 195-197 of VVM 1.1.

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 the 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 monthly statement from April 2008- March 2009 and found to be consistent.

The metering equipments are of 0.2% accuracy class and calibration. This has been consistently mentioned in the monitoring report ^{/3/} and in registered monitoring plan ^{/1/}. The MR version 01 dated 22/03/2010 did not include the calibration schedule and certification details of all the monitoring equipments required for monitoring of the parameters in line with registered monitoring plan. Hence the PP was requested to provide the details in the MR. Hence, **CL 01** was raised.

In response the PP included the Calibration Certificates^{/6/,7/,18/,22/} for the equipments in the revised monitoring report version 02 dated 16/04/2010 and subsequently in final version 03 of the MR dated 09/07/2010. The certificates have been checked in original and was found to be consistent and in-line with the schedule of calibration provided in the registered PDD and also covering the current monitoring period from 01/04/2008 to 31/03/2009. Hence the same has been accepted and **CL 01** was closed out.

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. 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.

Verification 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 the registered PDD the key parameters being measured and reviewed periodically as per the procedures. This was checked during the site visit and was found to be consistent.

3.6 Accuracy of Emission Reduction Calculations

The total emission reductions in the monitoring report for the period 01/04/2008 to 31/03/2009 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,^{/10/} coal stock register/ audited company Annual report, Central Institute of Mining and Fuel Research, Bilaspur Unit, Report No.08/P/28, Report No.08/P/59[A], Report No.08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period from 01-04-2008- 31-3-2009, accredited external laboratory monthly test reports^{/14/} respectively and were found to be correct. The monitoring procedures^{/1/} 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 (refer to www.osc.edu/research/pcrm/emissions/coal.shtml). This has been cross checked with the coal invoice of South Eastern Coalfield Limited Ref No: 2000808/4901/00107/58951 dated 15/09/2008^{/8/} and found to be consistent. Furthermore, samples of ultimate analysis conducted by Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No.08/P/59[B], Report No.08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period from 01-04-2008-31-03-2009 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 21.80% and 31.90%. 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 01/04/2008 to 31/03/2009 was found to be acceptable to the verification team. Further explanation of this is included in **CAR 05** in section 3.1 of this report.

The calculation of emission reductions is found to be correct however **CAR 03** was raised as the ER excel sheet along with the Monitoring Report version 01 dated 22/03/2010 shows a difference in the data for the parameter Electrical Energy Export to CSEB when monitored in house and at the grid end. The PP was asked to clarify how the value Electrical Energy Export to CSEB Grid (as per CSEB Statement) is inconsistent with the Electrical Energy Export to CSEB (As per the in-house Export Meter of SEMS).

In response the PP provided the following explanation that the in-house export meter is under the control of Vandana Vidhyut Limited but the CSEB export meter is sealed and calibrated by the Chhattisgarh State Electricity Board (CSEB). The in-house export meter readings are taken on a daily basis while the CSEB export meter readings are taken on a monthly 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 are taken at 12 noon. The 6 hour 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.

Moreover, there is associated T&D loss (although negligible), the CSEB export meter being located at some distance from the plant (where the in-house export meter is located). However, the percentage difference between the two meter readings for the monitoring period is 0.08%, which can be considered as negligible and hence justified with the above mentioned reasons.

Furthermore it may be noted that as per the monitoring plan of the registered PDD, the baseline emission calculations are based on net electricity exported to the grid as recorded by the CSEB export meter which is found to be lower than that recorded by the in-house export meter for the monitoring period under consideration. This has yielded and adopted a conservative value of baseline emissions and in turn the emission reductions resulting from the project activity.

The emission reduction sheet for the project has been checked for consistency in terms of the value Electrical Energy Export to CSEB Grid (as per CSEB Statement) with the Electrical Energy Export to CSEB at the VVL end. The logic provided by the PP in this regard on the 6 hour time difference in monitoring the two meters is found to be acceptable as it was cross verified during the site visit and is consistent with the actual scenario.

Further 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. The same has been cross checked with the estimation of emission reduction excel sheet and found to be consistent and hence is accepted. The conservative approach of estimation of the emission reduction is also in line with the monitoring methodology hence accepted leading to the closure of **CAR 03**.

The response to CARs was satisfactory and these were 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 was found to be 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.

The Monitoring Report version 01 dated 22/03/2010 does not mention the particulars relating to the internal audits conducted for the project during the selected monitoring period. The PP was requested to clarify for the same. **CL 02** was raised.

The Monitoring Report version 01 dated 22/03/2010^{/2/} was updated to version 02 dated 16/04/10^{/3/} and the internal audits conducted for the project during the selected monitoring period has been included in the

Monitoring Report version 02. The monitoring report version 02 dated 16/04/2010 and subsequently in final version 03 of the MR dated 09/07/2010 was checked and the internal audit details being carried out on 11/07/2008, 7/10/2008, 07/01/2009 and 09/04/2009^{/16/} have been found to be in line with the actual scenario which has been verified during the site visit hence is found to be acceptable. Hence **CL 02** was closed out

There is a defined procedure^{/23/} 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 we can affirm 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 kgCO₂ /kWh has been cross checked and were found to be consistent with the value mentioned at page number 32 of the registered PDD^{/11/}

-Carbon content in Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No 08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period of time from April 2008- March 2009 monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range 21.80% to 31.90% which have been cross checked with respective monthly ultimate coal analysis laboratory reports and were found to be satisfactory.

-Calorific Value of Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No 08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period of time from April 2008- March 2009 monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 1935-2895 kCal/kg, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and were found to be satisfactory.

4. Calculation of Emission Reductions

Parameter	Reported Value		Verified Value	
	01/04/08 to 31/03/09		01/04/08 to 31/03/09	
Power Export (kWh)	57685920		57685920	
Coal Consumption (Tonnes)	18723.140		18723.140	
Carbon content of coal (%)	Apr-08	31.40	Apr-08	31.40
	May-08	29.80	May-08	29.80
	Jun-08	23.10	Jun-08	23.10
	Jul-08	29.40	Jul-08	29.40
	Aug-08	27.30	Aug-08	27.30
	Sep-08	29.10	Sep-08	29.10
	Oct-08	31.90	Oct-08	31.90
	Nov-08	24.70	Nov-08	24.70
	Dec-08	25.70	Dec-08	25.70
	Jan-09	22.60	Jan-09	22.60
	Feb-09	28.40	Feb-09	28.40
	Mar-09	21.80	Mar-09	21.80
Grid Emission factor (kgCO ₂ /kWh)	0.820		0.820	
Total Electricity Generated (KWh)	64642900		64642900	
Auxiliary Consumption (KWh)	7087940		6644850	
Rice Husk Consumption (Tonnes)	68002.924		68002.924	
Calorific Value of Rice Husk (kCal/kg)	Apr-08	2842	Apr-08	2842
	May-08	2710	May-08	2710
	Jun-08	3044	Jun-08	3044
	Jul-08	2906	Jul-08	2906
	Aug-08	2890	Aug-08	2890
	Sep-08	2916	Sep-08	2916
	Oct-08	3020	Oct-08	3020
	Nov-08	2984	Nov-08	2984
	Dec-08	3062	Dec-08	3062
	Jan-09	2858	Jan-09	2858
	Feb-09	3016	Feb-09	3016
	Mar-09	2898	Mar-09	2898
Calorific Value of Coal (kCal/kg)	Apr-08	2895	Apr-08	2895
	May-08	2730	May-08	2730
	Jun-08	2040	Jun-08	2040
	Jul-08	2595	Jul-08	2595
	Aug-08	2310	Aug-08	2310
	Sep-08	2755	Sep-08	2755
	Oct-08	2870	Oct-08	2870
	Nov-08	2435	Nov-08	2435
	Dec-08	2335	Dec-08	2335
	Jan-09	2020	Jan-09	2020
	Feb-09	2705	Feb-09	2705
	Mar-09	1935	Mar-09	1935

Parameter	Reported Value		Verified Value	
	01/04/08 to 31/03/09		01/04/08 to 31/03/09	
Plant Heat Rate (kCal/kWh)	Apr-08	3909.97	Apr-08	3909.97
	May-08	3751.42	May-08	3751.42
	Jun-08	3894.56	Jun-08	3894.56
	Jul-08	3953.42	Jul-08	3953.42
	Aug-08	3851.72	Aug-08	3851.72
	Sep-08	4058.75	Sep-08	4058.75
	Oct-08	4092.27	Oct-08	4092.27
	Nov-08	3804.64	Nov-08	3804.64
	Dec-08	3828.82	Dec-08	3828.82
	Jan-09	3365.32	Jan-09	3365.32
	Feb-09	3753.38	Feb-09	3753.38
	Mar-09	3395.20	Mar-09	3395.20
Efficiency of power generation (%)	Apr-08	22.00	Apr-08	22.00
	May-08	22.92	May-08	22.92
	Jun-08	22.08	Jun-08	22.08
	Jul-08	21.75	Jul-08	21.75
	Aug-08	22.33	Aug-08	22.33
	Sep-08	21.19	Sep-08	21.19
	Oct-08	21.02	Oct-08	21.02
	Nov-08	22.60	Nov-08	22.60
	Dec-08	22.46	Dec-08	22.46
	Jan-09	25.55	Jan-09	25.55
	Feb-09	22.91	Feb-09	22.91
	Mar-09	25.33	Mar-09	25.33

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

1. Total Baseline Emissions = Power Export to CSEB Grid * Grid emission Factor
= 57685920 kWh * 0.820 kgCO₂/kWh
= 47,302 tCO₂.
2. Total Project Emissions = (44/12) * Quantity of Coal consumed * Carbon content of coal
= 18,747tCO₂.
3. Emission Reductions = Total Baseline Emissions – Project Emissions
= (47,302 – 18,747) tCO₂
= 28,555tCO₂.



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. 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 evidences have 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 kgCO₂/kWh) has been cross checked with in the same as mentioned in page 32 of the registered PDD (UN ref. no. 0186) and was found to be satisfactory.

Carbon content in Coal is analysed by the Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No 08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period of time from April 2008- March 2009 at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range 21.80% to 31.90% which have been cross checked with respective monthly ultimate coal analysis laboratory reports and was found to be satisfactory.

Calorific Value of Coal is analysed by Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No 08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27^{/14/} over the period of time from April 2008- March 2009 monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 1935-2895 kCal/kg, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found 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 or Monitoring Plan.

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 tCO₂ for the period 01/04/2008 to 31/03/2009 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 28,555 tCO₂ for the same period. Clarification for such 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 01/04/2008 – 31/03/2009.

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 03 dated 09/07/2010.

The management of the Vandana Vidhyut Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 02 dated 16/04/2010. Calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Rice Husk Based Power Project. 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 01/04/2008 – 31/03/2009 based on the reported emission reductions in the Monitoring Report version 03 dated 09/07/2010 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 and Approved Used for Verification:	Registered PDD – “Rice Husk based Power Project” Version & date of the registered PDD is not available.
Methodology Used for Verification:	AMS I.D version 07, dated 28 November 2005
Applicable Period:	01/04/2008 to 31/03/2009
Total GHG Emission Reductions Verified:	28,555 tCO _{2e}

Signed on behalf of the Verification Body by Authorized Signatory



Signature:

Name: Siddharth Yadav

Date: 22nd July 2010

8. Document References

- /1/ Registered PDD – “Rice Husk based Power Project”, UN Ref. 0186
- /2/ Monitoring Report version 01, dated 22/03/2010
- /3/ Monitoring Report version 02, dated 16/04/2010 & Monitoring Report version 03 dated 09/07/2010
- /4/ Emission reduction calculation spreadsheet, version 02 & Emission reduction calculation spreadsheet, version 03
- /5/ Plant Records for the entire period of 2008 - 2009.
- /6/ Calibration certificates of Gross energy meter – s/n: 02131300 YB/VVL/07-08/EM-02 dated 24/3/2008 and YB/VVL/2008-09/M-07 dated 24/03/2009 .)
- /7/ Calibration certificates of Auxiliary energy meter – s/n: 7138950 YB/VVL/07-08/EM-03 dated 24/03/2008 and YB/VVL/2008-09/EM-04 dated 24/03/2008
- /8/ Coal receipt from the South Eastern Coalfields Limited (2000808/4901/00107/58951 dated 15/09/2008)
- /9/ Bunker capacity certificates by Power Tech Engineers Consulting Engineers Ref: MS/PTE/09/23 dated 10/02/2009
- /10/ CSEB-HT monthly meter reading statements for the entire period of 2008 - 2009.
- /11/ Monthly Coal Stock Registers for the entire period of 2008 - 2009.
- /12/ Monthly Rice Husk Stock Registers for the entire period of 2008 - 2009.
- /13/ In-house laboratory records for analysis of rice-husk for the period 2008-2009.
- /14/ Central Institute of Mining and Fuel Research, Bilaspur Unit Report No.08/P/28, Report No.08/P/59[A], Report No 08/P/59[B], Report No. 08/P/83[A], Report No. 08/P/83[B], Report No. 08/P/116[A], Report No. 08/P/116[B], Report No. 08/P/134[A], Report No. 08/P/134[B], Report No. 08/P/134[C] and Report No 09/P/27 over the period of time from April 2008- March 2009
- /15/ Audited Annual Report for FY 2008 - 2009
- /16/ Internal Audit Reports dated 11/07/2008, 7/10/2008, 07/01/2009 and 09/04/2009
- /17/ Biomass Assessment Report (2008-2009), prepared by M/s. Power Tech Consulting Engineers, dated June 2008.
- /18/ Calibration Certificate number YB/VVL/07-08/EM-01 dated 24/03/2008 and YB/VVL/2008-09/M-06 dated 24/03/2009 TNB 00708, SEMS make
- /19/ Power Interruption details for the year 2008-2009
- /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”

9. Findings Overview

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	03	02	0

Date:	10/04/2010	Raised by:	Sanjay Banerjee /Shivaji Chakraborty		
Type:	CL	Number:	01	Reference:	AU4 3.5
Lead Assessor Comment:			Date: 10/04/2010		
Please include the Calibration schedule and Certification details of all the monitoring equipments required for monitoring of the parameters in line with registered monitoring plan in the Monitoring Report.					
Project Participant Response:			Date: 16/04/2010		
[The detailed Calibration schedule and Certification details of all the monitoring equipments is described in the table below:-					
No.	Monitoring Equipment	Calibrated/Certified by	Calibration Sl. No./Ref. No.	Calibration Date/Schedule	Certification Details
1	In-house Export Meter Make: - Secure Meter Limited (SEMS).	Yenkay Instruments And Controls Pvt. Ltd.	Sl.No-TNB00708	Calibration Date- 24-03-2008 and 24-03-2009 Next Calibration due on 24-03-2010.	Certificate Nos:- YB/VVL/07-08/EM-01 YB/VVL/2008-09/M-06
2	CSEB HT Meter	Maintained and calibrated by CSEB. All these meters are sealed by CSEB.			
3.	Bunker for measurement of coal and rice husk consumption Drg. No. VVL-Sk-16	Power Tech Engineers(Consulting Engineers	MS/PTE/09/23	N/A	Capacity Certificate date - 10/02/2009.
4.	In-house Generation Meter Make:- ABB	Yenkay Instruments And Controls Pvt. Ltd.	Sl. No-02131300	Calibration Date- 24-03-2008 and 24-03-2009 Next Calibration due on 24-03-2010.	Certificate Nos:- YB/VVL/07-08/EM-02 YB/VVL/2008-09/M-07
5.	Auxiliary Meter Make- GEC ALSTOM	Yenkay Instruments And Controls Pvt. Ltd.	Sl. No-7138950	Calibration Date- 24-03-2008 and 24-03-2009. Next Calibration due on 24-03-2010.	Certificate No:- YB/VVL/07-08/EM-03 YB/VVL/2008-09/EM-04
The relevant calibration certificates and certification documents have been provided in accordance to the above.					
Documentation Provided as Evidence by Project Participant:					

No.	Monitoring Equipment	Calibrated/Certified by	Calibration No./Ref. No.	Sl.
1	In-house Export Meter Make: - Secure Meter Limited (SEMS).	Yenkay Instruments And Controls Pvt. Ltd.	Sl.No-TNB00708	
2	CSEB HT Meter	Maintained and calibrated by CSEB. All these meters are sealed by CSEB.		
3.	Bunker for measurement of coal and rice husk consumption Drg. No. VVL-Sk-16	Power Tech Engineers(Consulting Engineers	MS/PTE/09/23	
4.	In-house Generation Meter Make:- ABB	Yenkay Instruments And Controls Pvt. Ltd.	Sl. No-02131300	
5.	Auxiliary Meter Make- GEC ALSTOM	Yenkay Instruments And Controls Pvt. Ltd.	Sl. No-7138950	

Information Verified by Lead Assessor:

- Revised Monitoring Report version 02 dated 16/04/2010
- Calibration Certificates: Yenkey Instruments And Controls Pvt. Ltd. Sl.No-TNB00708
- Calibration Certificates: CSEB HT Meter (As per CSEB Meter reading statement from April 2008 to March 2009)
- Calibration Certificates: Power Tech Engineers(Consulting Engineers: MS/PTE/09/23
- Calibration Certificates: Yenkey Instruments And Controls Pvt. Ltd. Sl. No-02131300
- Calibration Certificates: Yenkey Instruments And Controls Pvt. Ltd.Sl. No-7138950

Reasoning for not Acceptance or Acceptance and Close Out:

The Calibration Certificates for the equipments have been included in the revised monitoring report version 02 dated 16/04/2010. The certificates have been checked in original and found to be consistent and in-line with the schedule of calibration provided in the registered PDD. Hence the same has been accepted. CL 01 was closed out.

Acceptance and Close out by Lead Assessor: Closed **Date: 28/04/2010**

Date:	10/04/2010	Raised by:	Sanjay Banerjee /Shivaji Chakraborty		
Type:	CL	Number:	02	Reference:	AU4 4.5

Lead Assessor Comment: **Date: 10/04/2010**

The Monitoring Report version 01 dated 22/03/2010 does not mention the particulars relating to the internal audits conducted for the project during the selected monitoring period.
Please provide clarification for the same.

Project Participant Response: **Date: 16/04/2010**

[Note to PP: Insert your Response to SGS Finding here]

The Monitoring Report version 01 dated 22/03/2010 has been updated to version 02 dated 16/04/10 and the internal audit conducted for the project during the selected monitoring period has been included in the Monitoring Report version 02.

Documentation Provided as Evidence by Project Participant:

Monitoring Report version 02 with filename as VVL_MR4_version 02.

Information Verified by Lead Assessor:

Monitoring Report version 02 with filename as VVL_MR4_version 02.

Reasoning for not Acceptance or Acceptance and Close Out:

The monitoring report version 02 dated 16/04/2010 has been checked and the internal audit details have been found to be in line with the actual scenario which has been verified during the site visit hence acceptable. Hence CL 02 was closed out

Acceptance and Close out by Lead Assessor: Closed **Date: 28/04/2010**

Date:	10/04/2010		Raised by:	Sanjay Banerjee /Shivaji Chakraborty	
Type:	CAR	Number:	03	Reference:	AU4 Section 3 (Parameter 1.4)
Lead Assessor Comment:				Date: 10/04/2010	
<p>The ER excel sheet along with the Monitoring Report version 01 dated 22/03/2010 shows a difference in the data for the parameter Electrical Energy Export to CSEB while monitored in house and at the grid end. The PP is requested to clarify how the value Electrical Energy Export to CSEB Grid (as per CSEB Statement) is inconsistent with the Electrical Energy Export to CSEB (As per the in-house Export Meter of SEMS).</p>					
Project Participant Response:				Date: 16/04/2010	
<p>The in-house export meter is under the control of Vandana Vidhyut Limited but the CSEB export meter is sealed and calibrated by the Chhattisgarh State Electricity Board (CSEB). The in-house export meter readings are taken on a daily basis while the CSEB export meter readings are taken on a monthly 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 are taken at 12 noon. The 6 hour 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.</p> <p>Moreover, there is associated T&D loss (although negligible), the CSEB export meter being located at some distance from the plant (where the in-house export meter is located). However, the percentage difference between the two meter readings for the monitoring period is 0.08%, which can be considered as negligible and hence justified with the above mentioned reasons.</p> <p>Furthermore it may be noted that as per the monitoring plan of the registered PDD, the baseline emission calculations are based on net electricity exported to the grid as recorded by the CSEB export meter which is found to be lower than that recorded by the in-house export meter for the monitoring period under consideration. This has yielded a conservative value of baseline emissions and in turn the emission reductions resulting from the project activity.</p>					
Documentation Provided as Evidence by Project Participant:					
ER_VVL_2008-09					
Information Verified by Lead Assessor:					
ER_VVL_2008-09					
Reasoning for not Acceptance or Acceptance and Close Out:					
<p>The emission reduction sheet for the project has been checked for consistency in terms of the value Electrical Energy Export to CSEB Grid (as per CSEB Statement) with the Electrical Energy Export to CSEB at the VVL end. The logic provided by the PP in this regard on the time difference in monitoring the two meters is found to be acceptable.</p> <p>Further 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. The conservative approach of estimation of the emission reduction is also in line with the monitoring methodology hence the same can be accepted. CAR 03 is closed out.</p>					
Acceptance and Close out by Lead Assessor: Closed				Date: 28/04/2010	

Date:	10/04/2010		Raised by:	Sanjay Banerjee /Shivaji Chakraborty	
Type:	CAR	Number:	04	Reference:	AU4 Section 3 (Parameter 1.2)
Lead Assessor Comment:				Date: 10/04/2010	
<p>The PP is requested to clarify how the value of Auxiliary Consumption for Electrical Energy has been arrived at.</p>					
Project Participant Response:				Date: 16/04/2010	

<p>In Monitoring Report/Version 01, the data for auxiliary consumption of the rice husk based power plant were based on the difference between the gross generation meter readings and the in-house export meter readings.</p> <p>In Monitoring Report/ Version 02, the data for auxiliary consumption of the rice husk based power plant have been rectified on the basis of the measured values as per the auxiliary meter readings in line with the registered monitoring plan mentioned in the registered PDD. The relevant plant log-sheets showing the metered values of the auxiliary consumption have been provided to the DOE. The soft copies of the log-sheets for the auxiliary meter readings have also been provided to the DOE.</p> <p>However, the calculation of emission reductions is not affected by the value of the auxiliary consumption of the power plant. The monitoring plan for the CDM project activity under consideration includes measurement of the parameter mainly to monitor the operational efficiency of the plant.</p>					
Documentation Provided as Evidence by Project Participant:					
VVL_Generation(2008-09), Auxiliary Consumption_VVL_2008-09, ER_VVL_version 02					
Information Verified by Lead Assessor:					
VVL_Generation(2008-09) Auxiliary Consumption_VVL_2008-09 ER_VVL_version 02					
Reasoning for not Acceptance or Acceptance and Close Out:					
The Monitoring Report/ Version 02 dated 16/02/2010 has been checked with the excel sheet for emission reduction calculation and it is found to be consistent with regard to the auxiliary consumption for electrical energy. The values have been rectified with the metered value of the parameter as compared to the values provided from the estimation from the difference of gross generation and net generation. This is in line with the monitoring plan mentioned in the PDD and hence can be accepted. There has been no change in the emission reduction due to the change in the values of the auxiliary consumption which has been cross checked and found to be consistent and hence acceptable. CAR 04 was closed out.					
Acceptance and Close out by Lead Assessor: Closed				Date: 28/04/2010	

Date:		28/04/2010		Raised by:		Sanjay Banerjee /Shivaji Chakraborty					
Type:		CAR		Number:		05		Reference:		AU4 Section 3 Emission Reduction	
Lead Assessor Comment:								Date: 28/04/2010			
The amount of Emission Reduction for the monitoring period from 01/04/2008 to 31/03/2009 is higher than the emission reduction for the same period mentioned in the registered PDD. The PP has to clarify why there has been a rise in the post-ex emission reduction over the ex-ante calculation in accordance with the guideline of EB.											
Project Participant Response:								Date: 28/04/2010			

<p>In the registered PDD, the emission reductions for the entire crediting period were projected based on</p> <ul style="list-style-type: none"> 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. <p>In line with the registered monitoring plan, the emission reductions for the period 2008-2009 are calculated based on</p> <ul style="list-style-type: none"> Baseline emissions corresponding to a net exported electricity of 57.686 GWh to CSEB grid for the year 2008-2009 Project emissions resulting from co-firing of 18723.140 tonnes of coal with rice husk in 2008-2009 and a total carbon content of coal (measured monthly) ranging between 21.80% to 31.90% <p>The above explanation signifies:</p> <p>(i) an increase in baseline emissions of 10080 tonnes CO₂ in 2008-2009 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,</p> <p>(ii) a marginal increase in project emissions of 2601 tonnes CO₂ in 2008-2009 with respect to that in 2002-2003 (as provided in the registered PDD) which is attributed to an increase in coal consumption but a corresponding reduction in total carbon content of coal used.</p> <p>This justifies an increase in emission reductions for the period 2008-2009 by 7479 tonnes of CO₂ with respect to that projected in the registered PDD.</p>	
Documentation Provided as Evidence by Project Participant:	
Monitoring Report version 02 with filename as VVL_MR4_version 02.	
Information Verified by Lead Assessor:	
Monitoring Report version 02 with filename as VVL_MR4_version 02.	
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 2008-2009 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 2008-2009. The logic has been cross checked against the actual scenario seen during the site visit and the data provided for the duration 2008-2009 and found to be consistent. Hence the same was accepted. CAR 05 was closed out</p>	
Acceptance and Close out by Lead Assessor: Closed	Date: 29/04/2010

10. Statement of Competence

Statement of Competence

Name: **Banerjee, Sanjay** SGS Affiliate: **SGS India**

Status

-	Lead Assessor	<input checked="" type="checkbox"/>	-	Expert	<input checked="" type="checkbox"/>
-	Assessor	<input checked="" type="checkbox"/>	-	Financial Expert	<input type="checkbox"/>
-	Local Assessor	<input checked="" type="checkbox"/>	-	Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
<i>Sub scope(s): Hydro</i>	
2. Energy Distribution	<input type="checkbox"/>
<i>Sub scope(s):</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input type="checkbox"/>
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: **Siddharth Yadav** Date: **28/10/2009**

Statement of Competence

Name: Chakraborty, Shivaji SGS Affiliate: SGS India

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
<i>Sub scope(s): Solar and Biomass Electricity Utilization</i>	
2. Energy Distribution	<input checked="" type="checkbox"/>
<i>Sub scope(s): Energy Distribution</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input type="checkbox"/>
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 27 November 2009

11. Photographic Evidence

Unique reference number: 02131300

Parameter: Total Electricity Generated (kWh)

Name of equipment: ABB Energy Meter

Date:10/04/2010



Unique reference number: 7138950

Parameter: Auxiliary Consumption (kWh)

Name of equipment: Alstorm Energy Meter

Date:10/04/2010



Unique reference number: CSE 00046

Parameter: Power Export (kWh)

Name of equipment: SEMS Export Meter (CSEB)

Date:10/04/2010



Unique reference number: TNB 00708

Parameter: Power Export (kWh) (In house meter)

Name of equipment: Secure Meters

Date:10/04/2010



Unique reference number: BCM/21018

Parameter: Calorific Value of Rice Husk (kCal/kg)

Name of equipment: Advance Research Instrument Corporation – Bomb Calorimeter Date:10/04/2010



Photographic Evidences of Auditor on Site:



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