VERIFICATION AND CERTIFICATION REPORT

Vandana Vidhyut Limited

Rice Husk Based Power Project

SGS Climate Change Programme
SGS United Kingdom Ltd
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United Kingdom

Date of Issue:	**Project Number:**
20/03/2009	CDM.VER0053
Project Title:	
Rice Husk Based Power Project	
Organisation:	**Client:**
SGS United Kingdom Limited	Vandana Vidhyut Limited
Publication of Monitoring Report: 02/09/2008	
Monitoring Period:	01/04/2007 to 31/03/2008
First Monitoring report Version and Date:	Version 01, dated 26.08.2008
Final Monitoring report Version and Date:	Version 02, dated 20/01/2009

Summary:

SGS United Kingdom Ltd has performed the third periodic verification of the CDM project Rice Husk Based Power Project by Vandana Vidhyut Limited, UNFCCC Ref Number 0186. The verification includes confirming the implementation of the monitoring plans of the registered PDD and the application of the monitoring methodology as per AMS-I.D version 7 dated 28th November 2005. A site visit was conducted to verify the data submitted in the monitoring report.

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.

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 **31,559 tCO2e** during period 01/04/2007 up to 31/03/2008.

Subject:			
CDM Verification			
Verification Team:			
Ajoy Gupta – Lead Assessor			☒ No Distribution (without permission from the Client or responsible organisational unit)
Technical Review:	**Trainee Technical Reviewer:**		
Date: 26/01/2009 & 20/03/2009 Name: Jochen Gross	Name: N/A		☐ Limited Distribution
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Name: Siddharth Yadav Date: 24th March 2009			☐ Unrestricted Distribution
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1	20/03/2009	20	
2	-	-	

Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CO2	Carbon Dioxide
COP/MOP	Conference of Parties serving as the Meeting of Parties to Kyoto Protocol
CSEB	Chattisgarh State Electricity Board
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
ER	Emission Reduction
GHG	Greenhouse Gas(es)
GCV	Gross calorific value
IPCC	Intergovernmental Panel on Climate Change
MT	Metric Tonne
NIR	New Information Request
NCV	Net Calorific Values
PDD	Project Design Document
PE	Project Emissions
TPH	Tonne per hour
UNFCCC	United Nations Framework Convention for Climate Change
VVL	Vandana Vidhyut Limited

Table of Content

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 No:	UN 0186
Monitoring Period Covered in this Report	01/04/2007 to 31/03/2008
Project Participants	Vandana Vidhyut Limited.
Location of the Project Activity:	Bilaspur/Raipur/Chattisgarh/India

Vandana Vidyut 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) fluidised bed combustion type boiler with the outlet steam parameters of 66 kg/cm2 and 500^{o}C and a bleed-cum-condensing type 7.7 MW capacity turbo-generator for generation of power.

2. Methodology

2.1 General Approach

SGS's 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	SGS Office
Ajoy Gupta	Lead Assessor	SGS India

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 performed.

Location: Bilaspur/Raipur/Chattisgarh/India	**Date:** 26/09/2008
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. Satish Pandey (General Manager-Finance & CDM Coordinator) Mr. R.K. Srivastav (DGM-Operations) Mr. Shiv Kumar Soni (General Manager-Power Plant) Mr. S.R. Bajpai (Manager-Commercial)
Confirmation of data collection and handling procedures. Cross checking daily records, monthly records, audited annual report, emission reduction calculation, project emissions and leakage.	Mr. R.K. Srivastav (DGM-Operations) Mr. Shiv Kumar Soni (General Manager-Power Plant)
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.Garnaik (Manager Electrical & Instrumentation) Mr. Shiv Kumar Soni (General Manager-Power Plant) Mr. Satish Singh (Shift-in charge) Mr. R.K. Srivastav (DGM-Operations)

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 New Information Request (NIR) 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. the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;

II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

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.

Corrective Action Requests and New Information Requests are detailed in Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

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 Documentation and Compliance with the Registered PDD

The project documentation was found in compliance with the registered PDD. 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 01/04/2007 to 31/03/2008. This was checked from the UNFCCC website:

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

3.2 *Monitoring Results*

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. no. YB/VBL/06-07/EM-02 dated 06-01-2007 and YB/VVL/07-08/EM-02 dated 24/3/2008). The monitoring procedure of the total electricity generation along with calibration procedure of monitoring equipment was found in line with the registered PDD.

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 found correct.

3.2.1 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 nos. YB/VBL/07-08/EM-01 dated 09-10-2007 and YB/VVL/07-08/EM-03 dated 24/03/2008). The monitoring procedure of the auxiliary electricity consumption along with calibration procedure of monitoring equipment was found in line with the registered PDD.

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 auxiliary electricity consumption values for FY 2007 – 2008 as represented in MR version 1 were not matching with the actual metered data available in the plant log sheets, thus CAR 2 was raised for the clarification of such data discrepancy.

In monitoring report (version 1) 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 2 the project proponent (PP) has rectified the auxiliary electricity 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 2007 to March 2008 and found 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. Therefore

CAR 2 was closed out.

3.2.2 Power Export (kWh)

The power export is measured by the Chattisgarh State Electricity Board (CSEB) main meter 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 project proponent 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 numbers YB/VVL/07-08/EM-01 dated 24/03/2008 and YB/VBL/06-07/EM-01 dated 06/01/2007 respectively,. The energy export meter is calibrated by a third party on a regular basis as mentioned in the registered PDD and Monitoring Report. The in-house export meter reading by the power project is measured in the plant premises to the best accuracy and is recorded, monitored on a continuous basis through DCS.

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

3.2.3 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 rice husk consumption was found in line with the registered PDD, page 39. The scaling of bunker was carried out by VVL which was certified by Rishu Engineering Works, Bilaspur. The bunker capacity certificates (ref no. MS/BSP/2004/1381 dated 25.01.04 and MS/B/08/773A dated 15.02.08) have been cross checked, this certifies the capacity for coal bunker as 174.280M^3.
The data for the quantity of coal consumption is monitored on daily basis through on-site measurements and captured under Coal stock Register. 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.

The coal consumption values have been cross checked with the Coal stock register (ref. id. /11/) and audited annual report of the company (ref. id. /15/) and found correct.

3.2.4 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 Rishu Engineering Works, Bilaspur. The bunker capacity certificates ref no. MS/BSP/2004/1381 dated 25.01.04 MS/B/08/773A dated 15.02.08 have been cross checked, which certifies the capacity for rice husk bunker 173.13 M^3.)

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 (ref. id. /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 (ref. id. /15/).

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 for the current monitoring period as per requirement of EB 28 Annex 35, was not made available initially. Thus project proponent was requested to clarify, how the assessment of leakage due to competing use of biomass has been performed and CAR 1 was raised.

In response to CAR 1 the PP has further submitted the annual (2007 – 2008) biomass assessment report (prepared by M/s. Power Tech Consulting Engineers, dated June 2008). The report was reviewed by the assessment team and found that the biomass available in 0-50 km range of the project site is 3,64,000 MT for the period 2007-2008 in comparison to the total biomass consumption of 57,625.45 tonnes for the project activity. Therefore, it was found justified that the project region 0-50 km radius of the project site has surplus availability of biomass, which is higher than the quantity of biomass that is utilised including the project activity. It was found evident that there was no possibility of competing use of biomass and subsequent leakage calculations for the current monitoring period is not required.

CAR 1 was closed out.

3.2.5 Calorific Value of Rice Husk (kCal/kg)

The calorific value of the rice husk is determined in the in-house laboratory of VVL as per the standard national practices by taking samples at random. The bomb calorimeter (Make: Advance Research Instruments Corporation, Model: BCM/21018) used for the purpose is calibrated internally once in a year following standard calibration procedure as provided under Advance Research Instruments Manual for Bomb calorimeter which is checked and found satisfactory.

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 has been cross checked with the in-house laboratory reports and found correct.

3.2.6 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 reduction. 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.

3.2.7 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 the emission reductions. The calculation of Efficiency of power generation in the emission reduction calculation sheet has been checked and found justified.

However, it was observed that the efficiency of power generation has been increased by 5% during 2007-2008 with respect to the last monitoring period. This 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 there were also less interruption was experienced at the state grid 33 kV feeder line (ref. id. /18/) in comparison to last year. The technical measures as undertaken in the project power plant (mainly in the existing boiler house) have been observed as the regular maintenance efforts and these are normal maintenance activities commonly available for all similar power plant projects. Thus these maintenance activities will not significantly affect or alter the project design as described in the registered PDD. The power interruption details (ref. id. /19/) during the year 2006, 2007 was checked and found consistent.

3.3 Remaining Issues, CAR's, FAR's from Previous Validation or Verification

The project got registered with the CDM EB as on 9th February 2006 and there are no issues remaining to be addressed with regard to Validation. Since registration this is the third monitoring period starting from 01/04/2007 to 31/03/2008 and there are no previous issues remaining to be addressed with regard to earlier periodic verifications.

3.4 Project Implementation

Project was implemented and equipment installed as described in the registered PDD. The project was registered with CDM EB on 09/02/2006 (UN Ref. 0186) and currently under operational condition.

3.5 Completeness of Monitoring

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable

3.6 Accuracy of Emission Reduction Calculations

The total emission reductions in the monitoring report for the period 2007-2008 has recorded more emission reductions 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, coal stock register/ audited company Annual report, National Accreditation Board for Testing and Calibration Laboratories (NABL), Department of Science & Technology, Government of India accredited external laboratory monthly test reports respectively and found correct. The monitoring procedures 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 said monitoring period) from the values considered for estimation of the ex ante emission reduction as presented in the registered PDD has resulted the difference in the total CER reported. The conservative *ex ante* estimate of emission reductions for the entire crediting period have been 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). Furthermore, samples of ultimate analysis conducted by Central Fuel Research Institute, Bilaspur Unit (accredited by NABL, India) 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 23.4% - 35.9%. Based on the responses from the project proponent and by verifying the coal receipt from the South Eastern Coalfields Limited which states that the coal used is 'F' grade. Thus the ex-post monitored emission reduction value for the monitoring period 01/04/2007 to 31/03/2008 was found acceptable to the verification team.

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 above in section 3.2 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 the members having long standing experience in the said field of operations. 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 internal audits are being conducted at regular intervals to excel and ensure control to keep the plant operational without any disturbance.

There is a defined procedure 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 Companies 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 found consistent with the value mentioned at page number 32 of the registered PDD.

Carbon content in Coal is analysed by the National Accreditation Board for Testing and Calibration Laboratories (NABL), Department of Science & Technology, Government of India accredited external laboratory (Central Fuel Research Institute, Bilaspur Unit, under Ministry of Science & Technology, Govt. of India at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range between 23.4% - 35.9%, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found satisfactory.

Calorific Value of Coal is analysed by the National Accreditation Board for Testing and Calibration Laboratories (NABL), Department of Science & Technology, Government of India accredited external laboratory (Central Fuel Research Institute, Bilaspur Unit, under Ministry of Science & Technology, Govt. of India at monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2160 – 3280 kCal/kg, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found satisfactory.

4. Calculation of Emission Reductions

Parameter	Reported Value 01/04/07 to 31/03/08	Verified Value 01/04/07 to 31/03/08
Power Export (kWh)	54139760	54139760
Coal Consumption (Tonnes)	11988.800	11988.800
Carbon content of coal (%)	Apr-07 29.10 May-07 28.60 Jun-07 30.60 Jul-07 23.40 Aug-07 28.30 Sep-07 28.60 Oct-07 29.90 Nov-07 29.60 Dec-07 31.10 Jan-08 35.90 Feb-08 29.70 Mar-08 28.90	Apr-07 29.10 May-07 28.60 Jun-07 30.60 Jul-07 23.40 Aug-07 28.30 Sep-07 28.60 Oct-07 29.90 Nov-07 29.60 Dec-07 31.10 Jan-08 35.90 Feb-08 29.70 Mar-08 28.90
Grid Emission factor[££] ($kgCO_2/kWh$)	0.820	0.820
Total Electricity Generated (KWh)	60872900	60872900
Auxiliary Consumption (KWh)	6729800	6482100
Rice Husk Consumption (Tonnes)	57625.450	57625.450
Calorific Value of Rice Husk (kCal/kg)	Apr-07 2760 May-07 2746 Jun-07 2808 Jul-07 2610 Aug-07 2708 Sep-07 2680 Oct-07 2712 Nov-07 2680 Dec-07 2728 Jan-08 2806 Feb-08 2666 Mar-08 2690	Apr-07 2760 May-07 2746 Jun-07 2808 Jul-07 2610 Aug-07 2708 Sep-07 2680 Oct-07 2712 Nov-07 2680 Dec-07 2728 Jan-08 2806 Feb-08 2666 Mar-08 2690
Calorific Value of Coal (kCal/kg)	Apr-07 2630 May-07 2615 Jun-07 2855 Jul-07 2160 Aug-07 2620 Sep-07 2690 Oct-07 2805 Nov-07 2835 Dec-07 2885 Jan-08 3280 Feb-08 2710 Mar-08 2680	Apr-07 2630 May-07 2615 Jun-07 2855 Jul-07 2160 Aug-07 2620 Sep-07 2690 Oct-07 2805 Nov-07 2835 Dec-07 2885 Jan-08 3280 Feb-08 2710 Mar-08 2680

Parameter	**Reported Value** 01/04/07 to 31/03/08	**Verified Value** 01/04/07 to 31/03/08
Plant Heat Rate (kCal/kWh)	Apr-07 3052.05 May-07 3066.32 Jun-07 3365.20 Jul-07 2822.40 Aug-07 2975.18 Sep-07 3057.10 Oct-07 3248.69 Nov-07 3287.98 Dec-07 3048.00 Jan-08 3490.06 Feb-08 2983.88 Mar-08 2970.50	Apr-07 3052.05 May-07 3066.32 Jun-07 3365.20 Jul-07 2822.40 Aug-07 2975.18 Sep-07 3057.10 Oct-07 3248.69 Nov-07 3287.98 Dec-07 3048.00 Jan-08 3490.06 Feb-08 2983.88 Mar-08 2970.50
Efficiency of power generation (%)	Apr-07 28.18 May-07 28.05 Jun-07 25.56 Jul-07 30.47 Aug-07 28.91 Sep-07 28.13 Oct-07 26.47 Nov-07 26.16 Dec-07 28.22 Jan-08 24.64 Feb-08 28.82 Mar-08 28.95	Apr-07 28.18 May-07 28.05 Jun-07 25.56 Jul-07 30.47 Aug-07 28.91 Sep-07 28.13 Oct-07 26.47 Nov-07 26.16 Dec-07 28.22 Jan-08 24.64 Feb-08 28.82 Mar-08 28.95

££ - 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
   = 54139760 kWh * 0.820 kgCO2/kWh
   = 44,395 tCO2.
2. Total Project Emissions = (44/12) * Quantity of Coal consumed * Carbon content of coal
   = 12,836 tCO2.
3. Emission Reductions = Total Baseline Emissions – Project Emissions
   = (44,395 – 12,836) tCO2
   = 31,559 tCO2.

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. Ajoy Gupta visited the site 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 found satisfactory.

*Carbon content in Coal is analysed by the NABL accredited external laboratory (*Central Fuel Research Institute, Bilaspur Unit, under Ministry of Science & Technology, Govt. of India *at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range between* 23.4% - 35.9%*, which have been cross checked with respective monthly ultimate coal analysis laboratory reports and found satisfactory.*

*Calorific Value of Coal is analysed by the NABL accredited external laboratory (*Central Fuel Research Institute, Bilaspur Unit, under Ministry of Science & Technology, Govt. of India *at monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2160 – 3280 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 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 01/04/2007 to 31/03/2008 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 31559 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 at 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 No. 0186 in the period 01/04/2007 to 31/03/2008.

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 Rice Husk Based Power Project at Bilaspur, Raipur, Chattisgarh by M/s Vandana Vidhyut Limited (VVL), date 20/01/2009, version 2 of the monitoring report.

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 2 dated 20/01/2009. 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 01/04/2007 to 31/03/2008 based on the reported emission reductions in the monitoring report version 2 dated 20/01/2009 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:

Name and Reference Number of Project	Rice Husk Based Power Project, UNFCCC Ref No. 0186.
Registered and Approved Methodology and PDD used for Verification	Registered PDD – "Rice Husk based Power Project", AMS-I.D version 07, dated 28 November 2005
Applicable Period	01/04/2007 to 31/03/2008
Total GHG Emission Reductions Verified	**31559 tCO_2e**

Signed on behalf of the Verification Body by Authorized Signatory

Signature: 

Name: Siddharth Yadav

Date: 24th March 2009

8. Document References

/1/ Registered PDD – "Rice Husk based Power Project", UN Ref. 0186

/2/ Monitoring Report version 01, dated 26/08/2008

/3/ Monitoring Report version 02, dated 20/01/2009

/4/ Emission reduction calculation spreadsheet, version 02

/5/ Plant Records for the entire period of 2007 - 2008.

/6/ Calibration certificates of Gross energy meter – s/n: 02131300 (Calibration Certificate ref. no. YB/VBL/06-07/EM-02 dated 06-01-2007 and YB/VVL/07-08/EM-02 dated 24/3/2008.)

/7/ Calibration certificates of Auxiliary energy meter – s/n: 7138950 (Calibration Certificate nos. YB/VBL/07-08/EM-01 dated 09-10-2007 and YB/VVL/07-08/EM-03 dated 24/03/2008)

/8/ Coal receipt from the South Eastern Coalfields Limited (SECL/5100/07/2/01221 dated 31/10/2007)

/9/ Bunker capacity certificates by Rishu Engineering Works (ref no. MS/BSP/2004/1381 dated 25.01.04 MS/B/08/773A dated 15.02.08)

/10/ CSEB-HT meter reading statements for the entire period of 2007 - 2008.

/11/ Monthly Coal Stock Registers for the entire period of 2007 - 2008.

/12/ Monthly Rice Husk Stock Registers for the entire period of 2007 - 2008.

/13/ In-house laboratory records for analysis of rice-husk for the period 2007-2008.

/14/ Test Reports for coal from NABL accredited laboratory (Central Fuel Research Institute, Bilaspur Unit for the period 2007 – 2008.

/15/ Audited Annual Report for FY 2007 - 2008

/16/ Internal Audit Reports dated 10/06/2007, 08/10/2007, 05/01/2008.and 06/04/2008

/17/ Biomass Assessment Report (2007-2008), prepared by M/s. Power Tech Consulting Engineers, dated June 2008.

/18/ Declaration letter issued by VVL dated 14/05/2008 regarding increase in power generation efficiency during 2007 – 2008.

/19/ Power interruption details during 2006 and 2007.

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