
VERIFICATION AND CERTIFICATION REPORT

Vandana Vidhyut Limited

Rice Husk Based Power Project

SGS Climate Change Programme

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Date of Issue:		Project Number:	
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Project Title:			
Rice Husk Based Power Project			
Organisation:		Client:	
SGS United Kingdom Limited		Vandana Vidhyut Limited	
Publication of Monitoring Report:			
Monitoring Period:		01/04/2006 to 31/03/2007	
First Monitoring Version and Date:		Version 01, dated 31.08.2007	
Final Monitoring Version and Date:		Version 03, dated 24.04.2008	
Summary:			
<p>SGS United Kingdom Ltd has performed the second 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 UNFCCC ref. 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.</p> <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 32938 tCO₂e during period 01/04/2006 up to 31/03/2007.</p>			
Subject:			
CDM Verification			
Verification Team:			
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Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CO ₂	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	Green House 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

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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 No:	UN 0186
Monitoring Period Covered in this Report	01/04/2006 to 31/03/2007
Project Participants	Vandana Vidhyut Limited.
Location of the Project Activity:	Bilaspur/Raipur/Chhattisgarh/India

Vandana Vidhyut Limited has implemented a rice husk based 7.7 MW power project and the surplus power is being exported to CSEB grid after meeting in-house auxiliary demand. Coal is co-fired with rice husk to maintain consistency in power generation. The project activity involves operation of a 35 tonnes per hour (TPH) fluidised 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'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	SGSIN
Kamesh Iyer	Local Assessor	SGSIN
Sanjay Banerjee	Local Assessor (trainee)	SGSIN

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: 04/09/2007
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 01/04/2006 to 31/03/2007. 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/05-06/EM-02 dated 06-01-2006 and YB/VBL/06-07/EM-02 dated 06-01-2007.)

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.

➤ 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/06-07/EM-01 dated 08-10-2006 and YB/VBL/07-08/EM-01 dated 09-10-2007)

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 consumption figures have been checked with the plant energy reports 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. The same is computed only with the net electricity exported as metered by the Chattisgarh State Electricity Board (CSEB) Main Meter, which is in line with the registered PDD.

➤ 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/VBL/06-07/EM-01 dated 06/01/2007 and YB/VBL/05-06/EM-01 dated 06/01/2006 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.

CAR 02 was raised as the in-house export meter readings and CSEB export meter readings show positive or negative differences. The difference between in-house export meter readings and CSEB export meter readings due to time lag (6 a.m. daily and 12 noon monthly respectively) and difference in monitoring frequency has given rise to the difference in the reported values seems to be justified. The baseline emissions have been calculated on the basis of net electricity exported to CSEB grid as recorded by the CSEB export meter which is consistent with the monitoring plan of the registered PDD. The entire net electricity export figures have been cross checked with reference to the Chattisgarh State Electricity Board (CSEB) monthly H.T. Meter Reading Statements and found consistent with the reported data, thus CAR 02 was closed out.

The monthly power export values have been cross checked with the CSEB-HT meter Reading Statements and found fully 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 calculate the fuel fed from the bunker to the FBC boiler.

The scaling of bunker was carried out by VVL which was certified by Rishu Engineering Works, Bilaspur (Certificate ref no. is MS/BSP/2004/1381 dated 25.01.04 which certifies the capacity for coal bunker as 174.280M³.) 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 and audited annual report of the company and found correct.

➤ *Total Quantity of Rice Husk Consumption (Tonnes)*

The quantity of rice husk consumed is monitored by scaling of bunker (*i.e.* by measuring the difference in levels of rice husk in the bunker before feeding the husk and after discharging the same into the feeding hoppers of the FBC boiler). A standardized scaling chart for the bunker is used to calculate the fuel fed from the bunker to the FBC boiler. The scaling of bunker was carried out by VVL which was certified by Rishu Engineering Works, Bilaspur (Certificate ref no. is MS/BSP/2004/1381 dated 25.01.04 which certifies the capacity for rice husk bunker as 173.132 M³.)

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. 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 under company's annual audited report.

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

➤ *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.

NIR 04 was raised as the calorific values of the rice husk was monitored internally in the in-house laboratory of Vandana Vidhyut Limited and the reliability of test reports were to be justified by the PP. The calorific value for the rice husk is determined in the in-house laboratory of VVL and the bomb calorimeter (Make: Advance Research Instruments Corporation, Model: BCM/21018) used for the said purpose is calibrated once in a year internally. The standard calibration procedure adopted for the same has been provided in the Advance Research Instruments Manual for Bomb calorimeter, calibration Procedure, dated 30/03/2007 which is checked and found satisfactory. The calorific value of the rice husk is monitored once for the purpose of calculation of plant heat rate and efficiency of power generation as per the monitoring plan of the registered PDD. However the same is not required for computation of the emission reduction. The explanation was considered acceptable and the NIR 04 was closed out.

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.

➤ *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.

➤ *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.

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

The project got registered with the CDM EB as on 09 February' 2006 and there are no issues remaining to be addressed with regard to Validation. Since registration this is the second monitoring period starting from 01/04/2006 to 31/03/2007 and there are no previous issues remaining to be addressed with regard to earlier Verification.

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

CAR 01 was raised as the total emission reductions in the monitoring report version 01 for the period 2006-2007 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 26.8% - 37.7% (the analysis reports have been provided to the Verifier). 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 CAR 01 was closed out.

CAR 03 was raised as the Calorific Values for Coal mentioned in the MR version 01 were not matching with the external laboratory test certificates. Further some of the test samples for coal were tested in a NABL, Department

of Science & Technology, Government of India accredited laboratory namely Central Fuel research Institute, Bilaspur while samples for few months have been tested from Bhagavathi Ana Labs Ltd. and the traceability regarding credential of Bhagavathi Ana Labs Ltd was not clear. The revised version of the monitoring report dated 07 April 2008 has mentioned the calorific values of coal exactly as per the NABL accredited external laboratory test reports which has been cross checked and found satisfactory. Bhagavathi Ana Labs Ltd is a NABL, India accredited laboratory which has been checked from their website for traceability <http://www.bhagavathianalabs.com/> (last accessed on 17.04.08) and found satisfactory. Hence CAR 03 was closed out.

NIR 04 was raised as the calorific values of the rice husk was monitored internally in the in-house laboratory of Vandana Vidhyut Limited and the reliability of test reports were to be justified by the PP. The calorific value for the rice husk is determined in the in-house laboratory of VVL and the bomb calorimeter (Make: Advance Research Instruments Corporation, Model: BCM/21018) used for the said purpose is calibrated once in a year internally. The standard calibration procedure adopted for the same has been provided in the Advance Research Instruments Manual for Bomb calorimeter, calibration Procedure, dated 30/03/2007 which is checked and found satisfactory. The calorific value of the rice husk is monitored once for the purpose of calculation of plant heat rate and efficiency of power generation as per the monitoring plan of the registered PDD. However the same is not required for computation of the emission reduction. The explanation was considered acceptable and the NIR 04 was closed out.

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, and Bhagavathi Ana Labs Ltd.) at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range between 26.8% - 37.7%, 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, and Bhagavathi Ana Labs Ltd.) at monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2430 – 3715 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 01/04/06 to 31/03/07	Verified Value 01/04/06 to 31/03/07
Power Export (kWh)	57698240	57698240
Coal Consumption (Tonnes)	12649.648	12649.648
Carbon content of coal (%)	Apr-06 35.60 May-06 36.27 Jun-06 32.30 Jul-06 28.11 Aug-06 26.90 Sep-06 31.80 Oct-06 37.70 Nov-06 31.30 Dec-06 29.40 Jan-07 27.00 Feb-06 26.80 Mar-06 29.90	Apr-06 35.60 May-06 36.27 Jun-06 32.30 Jul-06 28.11 Aug-06 26.90 Sep-06 31.80 Oct-06 37.70 Nov-06 31.30 Dec-06 29.40 Jan-07 27.00 Feb-06 26.80 Mar-06 29.90
Grid Emission factor ^{EE} (kgCO ₂ /kWh)	0.820	0.820
Total Electricity Generated (kWh)	64862100	64862100
Auxiliary Consumption (kWh)	6647950	6657950
Rice Husk Consumption (Tonnes)	70796.914	70796.914
Calorific Value of Rice Husk (kCal/kg)	Apr-06 2812 May-06 2980 Jun-06 2920 Jul-06 2810 Aug-06 2860 Sep-06 3048 Oct-06 2942 Nov-06 2860 Dec-06 2910 Jan-07 2840 Feb-07 2915 Mar-07 2810	Apr-06 2812 May-06 2980 Jun-06 2920 Jul-06 2810 Aug-06 2860 Sep-06 3048 Oct-06 2942 Nov-06 2860 Dec-06 2910 Jan-07 2840 Feb-07 2915 Mar-07 2810
Calorific Value of Coal (kCal/kg)	Apr-06 3380 May-06 3471 Jun-06 3613 Jul-06 3327 Aug-06 2505 Sep-06 3000 Oct-06 3715 Nov-06 3030 Dec-06 2780 Jan-07 2505 Feb-07 2430 Mar-07 2815	Apr-06 3380 May-06 3471 Jun-06 3613 Jul-06 3327 Aug-06 2505 Sep-06 3000 Oct-06 3715 Nov-06 3030 Dec-06 2780 Jan-07 2505 Feb-07 2430 Mar-07 2815

Parameter	Reported Value	Verified Value
	01/04/06 to 31/03/07	01/04/06 to 31/03/07
Plant Heat Rate (kCal/kWh)	Apr-06 3414.72	Apr-06 3414.72
	May-06 3590.83	May-06 3590.83
	Jun-06 3647.17	Jun-06 3647.17
	Jul-06 3812.60	Jul-06 3812.60
	Aug-06 3704.20	Aug-06 3704.20
	Sep-06 4013.76	Sep-06 4013.76
	Oct-06 4038.04	Oct-06 4038.04
	Nov-06 3809.20	Nov-06 3809.20
	Dec-06 3815.20	Dec-06 3815.20
	Jan-07 3681.80	Jan-07 3681.80
	Feb-07 3750.80	Feb-07 3750.80
	Mar-07 3710.20	Mar-07 3710.20
Efficiency of power generation (%)	Apr-06 25.19	Apr-06 25.19
	May-06 23.95	May-06 23.95
	Jun-06 23.58	Jun-06 23.58
	Jul-06 22.56	Jul-06 22.56
	Aug-06 23.22	Aug-06 23.22
	Sep-06 21.43	Sep-06 21.43
	Oct-06 21.30	Oct-06 21.30
	Nov-06 22.58	Nov-06 22.58
	Dec-06 22.54	Dec-06 22.54
	Jan-07 23.36	Jan-07 23.36
	Feb-07 22.93	Feb-07 22.93
	Mar-07 23.18	Mar-07 23.18

EE - Grid emission factor used for emission reduction calculation is determined ex-ante and the value is fixed for the entire crediting period, as mentioned under registered PDD.

1. Total Baseline Emissions = Power Export to CSEB Grid * Grid emission Factor
= 57698240 kWh * 0.820 kgCO₂/kWh
= 47,313 tCO₂.
2. Total Project Emissions = (44/12) * Quantity of Coal consumed * Carbon content of coal
= 14375 tCO₂.
3. Emission Reductions = Total Baseline Emissions – Project Emissions
= (47,313 – 14,375) tCO₂
= 32,938 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. Mr. Kamesh Iyer 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, and Bhagavathi Ana Labs Ltd.) at monthly frequency as per the monitoring plan of the registered PDD. The coal carbon content values are within the range between 26.8% - 37.7%, 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, and Bhagavathi Ana Labs Ltd.) at monthly frequency as per the monitoring plan of the registered PDD. The coal calorific values are within the range between 2430 – 3715 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 01/04/2006 to 31/03/2007 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 32938 tCO₂ for the same period. Clarification for such difference was provided in CAR 01 (see 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 01/04/2006 to 31/03/2007.

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 07 April 2008, version 02 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 02 07/04/2008. 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 01/04/2006 to 31/03/2007 based on the reported emission reductions in the Monitoring Report version 02 dated 07/04/2008 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 PDD and Approved Methodology used for Verification	Registered PDD – “Rice Husk based Power Project”, AMS-I.D version 07, dated 28 November 2005
Applicable Period	01/04/2006 to 31/03/2007
Total GHG Emission Reductions Verified	32938 tCO₂

Signed on behalf of the Verification Body by Authorized Signatory

Signature:

Name: Siddharth Yadav

Date: 14th May 2008



8. Document References

- /1/ Registered PDD – “Rice Husk based Power Project”, UN Ref. 0186
- /2/ Monitoring Report, Version 01, dated 31.08.2007
- /3/ Monitoring Report, Version 03, dated 24.04.2008
- /4/ Emission reduction calculation spreadsheet, version 03
- /5/ Plant records
- /6/ Calibration certificates of Gross energy meter – s/n: 02131300 (Calibration Certificate ref. no. YB/VBL/05-06/EM-02 dated 06-01-2006 and YB/VBL/06-07/EM-02 dated 06-01-2007.)
- /7/ Calibration certificates of Auxiliary energy meter – s/n: 7138950 (Calibration Certificate nos. YB/VBL/06-07/EM-01 dated 08-10-2006 and YB/VBL/07-08/EM-01 dated 09-10-2007)
- /8/ Coal receipt from the South Eastern Coalfields Limited (SECL/5100/06/2/02115 dated 28/02/2007)
- /9/ Bunker capacity certificates by Rishu Engineering Works, dated 25/01/04
- /10/ CSEB-HT meter reading statements for the entire period of 2006 - 2007.
- /11/ Monthly Coal Stock Registers for the entire period of 2006 - 2007.
- /12/ Monthly Rice Husk Stock Registers for the entire period of 2006 - 2007.
- /13/ In-house laboratory records for analysis of rice-husk for the period 2006-2007.
- /14/ Test Reports for coal from NABL accredited laboratory (Central Fuel Research Institute, Bilaspur Unit and Bhagavathi Ana Labs Ltd) for the period 2006 – 2007.
- /15/ Audited Annual Report for FY 2006 - 2007
- /16/ Internal Audit Reports dated 08.06.2006, 06.10.2006, 10.01.2007.

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