VERIFICATION AND CERTIFICATION REPORT

SKS Ispat Limited

Waste Heat Recovery based captive power generation by SKS Ispat limited

SGS Climate Change Programme
SGS United Kingdom Ltd
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Date of Issue:	**Project Number:**
09-10-2008	CDM.VER0331
Project Title:	
Waste Heat Recovery based captive power generation by SKS Ispat Ltd	
Organisation:	**Client:**
SGS United Kingdom Limited	SKS Ispat Limited
Publication of Monitoring Report:	
Monitoring Period:	01-01-2007 to 30-06-2007
First Monitoring Version and Date:	01, 16-07-2007
Final Monitoring Version and Date:	1.3, 08-10-2008

Summary:

SGS United Kingdom Ltd has performed the First verification of the CDM project Waste Heat Recovery based captive power generation by SKS Ispat Ltd and UNFCCC Ref. Number 0674. The verification include confirming the implementation of the monitoring plan of the registered PDD having UNFCCC reg. no 0674 and the application of the monitoring methodology as per ACM0004 Version 02 dated 3rd March 2006. A site visit was conducted to verify the data submitted in the monitoring report.

The project activity involves installation of a 25 MW Waste heat recovery based power project. This comprises of one turbine of 25MW. Two boilers of 12TPH capacity and two boilers of 38TPH capacity are working at pressure 66 kg/cm2 and temperature 495 deg C. The project is utilizing power for captive use. Overall the project replaces the equivalent amount of energy from the western regional grid. This results into indirect CO2 emission reductions at the grid power plants which mainly use fossil fuels. In the baseline the electricity would have generated by western regional grid and due to the project activity which is utilizing captive power the project has replaced the GHG emission which otherwise would have been emitted by the grid power plants to generate equivalent amount of energy.

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 27120 tCO2e during period 01-01-2007 up to 30-06-2007.

Subject:			
CDM Verification			
Verification Team:			
Pankaj Mohan – Lead Assessor			☒ No Distribution (without permission from the Client or responsible organisational unit)
Technical Review:	**Trainee Technical Reviewer:**		
Date: 09-09-2008 Name: Vikrant Badve	Name: N/A		☐ Limited Distribution
Authorised Signatory:			
Name: Siddharth Yadav Date: 09-10-2008			☐ Unrestricted Distribution
Revision Number:	**Date:**	**Number of Pages:**	
0	18-08-2008	16	
1	05-09-2008	16	
2	09-10-2008	17	

Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission reduction
CSEB	Chhattisgarh State Electricity Board
DOE	Designated Operational Entity
ER	Emission Reduction
IPCC	Intergovernmental Panel on Climate Change
KWH	Kilo Watt Hour
MP	Monitoring Plan
MR	Monitoring Report
MT	Metric Tonne
MW	Mega Watt
MWH	Mega Watt Hour
NIR	New Information Request
PDD	Project Design Document
PE	Project Emissions
PPA	Power Purchase Agreement
PP	Project Participant
QA / QC	Quality Assurance / Quality Control
SV	Site Visit
UNFCCC	United Nations Framework Convention on Climate Change

Table of Content

1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by SKS Ispat Limited to perform an independent verification of its CDM project Waste Heat Recovery based captive power generation by SKS Ispat Ltd. 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:	Waste Heat Recovery based captive power generation by SKS Ispat Ltd
UNFCCC Registration No:	0674
Monitoring Period Covered in this Report	01-01-2007 to 30-06-2007
Project Participants	SKS Ispat Limited
Location of the Project Activity:	Village- Siltara, District Raipur, Chhattisgarh, India

The project activity involves installation of a 25 MW Waste heat recovery based power project. This comprises of one turbine of 25MW. Two boilers of 12TPH capacity and two boilers of 38TPH capacity are working at pressure 66 kg/cm2 and temperature 495 deg C. The project is utilizing power for captive use. Overall the project replaces the equivalent amount of energy from the western regional grid. This results into indirect CO2 emission reductions at the grid power plants which mainly use fossil fuels. In the baseline the electricity would have generated by western regional grid and due to the project activity which is utilizing captive power the project has replaced the GHG emission which otherwise would have been emitted by the grid power plants to generate equivalent amount of energy.

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
Pankaj Mohan	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: Siltara, Raipur District , Chhattisgarh, India	**Date:** 09-08-2007 to 10-08-2007
Coverage	**Source of Information / Persons Interviewed**
Assessment of Project Boundary	Physical Verification
Physical components	Physical Verification /Commissioning certificates
Plant Operations	Plant Manual
Monitoring and measuring system • Collection of measurements • Observations of established practices • Testing of the accuracy of monitoring equipment • Data Verification of monitoring parameters	Physical Verification /log books/ Calibration procedures/ Calibration certificates/QA / QC Manual/ - Mr. Prasad (President) - Mr. S N Mishra (GM Power Plant) - Mr. A M Sahay (DGM Power) - Mr. Vishal (Consultant)
CDM monitoring & reporting documentation	- Mr. Prasad (President) - Mr. S N Mishra (GM Power Plant) - Mr. A M Sahay (DGM Power) - Mr. Vishal (Consultant)
Quality Assurance – Management and operating system	Internal Audit procedure - Mr. Prasad (President) - Mr. S N Mishra (GM Power Plant) - Mr. A M Sahay (DGM Power) - Mr. Vishal (Consultant)

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 is in accordance with the registered PDD and the methodology ACM0004 version 02 dated 3rd March 2006. The project got registered on 17th December 2006. The monitoring plan of registered PDD is followed as it is and this is in compliance with monitoring methodology of ACM0004 version 02 3rd March 2006. The start date of crediting period got checked from UNFCCC website http://cdm.unfccc.int/Projects/DB/TUEV-SUED1159469829.04/view .

The Registered PDD was mentioning the frequency of monitoring as hourly for auxiliary consumption but the PP measured the data daily So a deviation was sought from UNFCCC and CAR01 was also raised for the same. The PP replied by providing the deviation approved by EB in EB41. This was checked from UNFCCC website http://cdm.unfccc.int/Projects/Deviations/index.html this was accepted and Hence CAR01 was closed.

3.2 Monitoring Results

Total Electricity Generation (E_{GEN}): This is measured by using calibrated meter having serial number PNL11653. The calibration certificate number VEPL/ T&CF/EM/01/Rev was checked and obtained the copy for the same. The calibration is valid for one year and covers the monitoring period. The total value reported for the period 01/01/2007 to 30/06/2007 is 42931 MWh as against the verified value of 38221 MWh. The check meter having serial number KAU 02025 is also installed at site as required by registered monitoring plan.

CAR07 was raised to get the spreadsheet. The PP replied by providing the spreadsheet with the response. This was checked during the desk review. This was accepted and CAR07 was closed out.

CAR02 was raised to get the value corrected as per the records verified during site visit and desk review. The PP replied by correcting the value reported in monitoring report version 1. The spreadsheet provided with the response was checked from the records provided by the PP during site visit and the value is matching. This was accepted and CAR02 was closed out.

Auxiliary consumption (E_{AUX}): This is measured by using calibrated meter having serial number PNL11658. The calibration was done. The calibration certificate number VEPL/ T&CF/EM/02/Rev was checked and obtained the copy for the same. The calibration is valid for one year and covers the monitoring period. The total value reported for the period 01/01/2007 to 30/06/2007 is 3750 MWh as against the verified value of 4777 MWh. The check meter having serial number 82925/92-4505 is also installed as site as required by registered monitoring plan.

CAR04 was raised to get the value corrected as per the records verified during site visit and desk review. The PP replied by correcting the value reported in monitoring report version 1. The spreadsheet provided with the response was checked from the records provided by the PP during site visit and the value is matching. This was accepted and CAR04 was closed out.

CAR03 was raised to get the calibration certificate for the monitoring period. The PP provided the same and this was desk reviewed and found to be in order. Hence this was accepted and CAR03 was closed out.

Net Electricity Generation (E_{NET}):- This is calculated based on the total electricity generation and auxiliary consumption. This is as per registered PDD. The total value reported for the period 01/01/2007 to 30/06/2007 is 39180 MWh as against the verified value of 33444 MWh. This was due to CAR02 and CAR04 which were mentioned above.

Diesel Consumption (Q_i): This is measured using weigh-scale attached with the tank. Diesel consumption data has been taken from the records maintained by the plant personnel and signed by the plant personnel and verified by the DGM & GM Power plant. The total value reported was 0 litres / tonnes for the period 01/01/2007 to 30/06/2007. The value verified was 100148 litres i.e. 85.1258 tonnes. The value is measured in litres and multiplied by the Density of diesel (0.85 Kg/L) and divided by a conversion factor of 1000. The density of diesel was checked from http://en.wikipedia.org/wiki/Diesel.

CAR06 was raised to get the value mentioned as per the records verified during site visit and desk review. The PP replied by taking the values not reported in monitoring report version 1. The spreadsheet provided with the response was checked from the records provided by the PP during site visit and the value is matching. This was accepted and CAR06 was closed out.

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

This is the first verification so there is no such issue.

3.4 Project Implementation

Project was implemented and equipment installed as described in the registered PDD;

NIR09 was raised to get the clarification on inclusion of Sponge iron kiln inside the project boundary and not taking project emissions for it. The PP responded by providing justification that Source of waste heat can be included inside the project boundary as per methodology and monitoring methodology does not mentions any parameter of sponge iron kiln to be monitored so this is in accordance with methodology ACM0004 version 02 dated 3rd March 2006. This was accepted after reviewing the meth and hence NIR09 was closed out.

NIR05 was raised to get the Pollution control board consent to operate the plant. The PP provided the same and these were checked and found to be in order hence NIR05 was closed.

3.5 Completeness of Monitoring

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable. The monitoring report version 1 was not mentioning the monitoring procedures so CAR08 was raised. The PP responded by providing the monitoring procedures in monitoring report which was checked and found that the monitoring procedure is OK. This was accepted and hence CAR08 was closed. The AFBC steam was diverted from 1st June 2007. This was checked from the Cethar vessels (P) Ltd. (Supplier) letter dated 22-06-2007 provided by PP. The days for which the steam was diverted are 1,2,3,4,6,7,14,15,19,20,22,23,24, 27,28, and 29 June 2007. This comes out to be 16 days in June 2007. The emission reductions for these 16 days were not claimed by the PP. This was checked from the plant records and spreadsheet provided by PP. This was found to be conservative and hence accepted.

3.6 Accuracy of Emission Reduction Calculations

The calculation of emission reductions was found to be incorrect due to CAR02, CAR04 & CAR06. As CAR02, CAR04, & CAR06 were resolved and revised spreadsheet was submitted. The revised spreadsheet was checked and found to be OK. The details of the reported and the verified values for all parameters are listed in section 4 below.

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 companies involved in the project have the quality assurance system implemented, this was checked during site visit by interviewing the management personnel, and therefore we can affirm that the management system the CDM project is in place; with the responsibilities properly identified and in place.

The data quality was verified in accordance with a quality assurance procedure as per registered PDD, which establishes the operational and management structure implemented.

3.9 Data from External Sources

The **baseline emission factor (EF)** of 0.819tCO2/MWh is fixed ex-ante. This was checked from Registered PDD page 37 as well.

The Registered PDD is using **Diesel emission factor (EFCO2 Diesel)** from 2006 IPCC guidelines and the value used is 74100 kg/TJ. This was checked from 2006 IPCC guidelines volume 2 chapter 1 page 23. This is reported in 74.1t/TJ as mentioned in PDD as well. This was also checked from Revised IPCC Guidelines also.

The **NCV of diesel** used is 43 TJ/Gg. The value was checked from IPCC Guidelines 2006 volume 2 chapter 1 page 18. This is reported as 0.043 TJ/t as mentioned in PDD. This was also checked from Revised 1996 IPCC Guidelines also.

4. Calculation of Emission Reductions

Parameter	Reported Value from MR-1	Verified Value from MR-1.3
Total generation (MWh)	42931	38221
Auxiliary Consumption (MWh)	3750	4777
Net Generation (MWh) calculated from Total generation – Auxiliary Consumption	39180	33444
EF of Electricity (tCO2/MWh) (Fixed ex-ante)	0.819	0.819
Auxiliary fuel consumption (Tonnes)	0	85.1258
NCV (TJ/t)	0	0.043
EF Diesel (t/TJ)	0	74.1

Based on the verified value, the emission reductions are

Baseline emissions: 33444 MWh x 0.819 tCO2/MWh = 27391 tCO2

Project emissions: (85.1258 x 0.043 x 74.1) = 271.2 tCO2 = 271 tCO2

Net emission reduction: (27391–271) tCO2 = 27120 tCO2e

5. Recommendations for Changes in the Monitoring Plan

No change in monitoring plan recommended to the project proponent as the registered PDD monitoring Plan is in accordance with Monitoring Methodology ACM0004 version 02 dated 3rd March 2006.

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. Pankaj Mohan – Lead Assessor 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.

Yes-The baseline emission factor of 0.819 tCO2/MWh is fixed ex-ante. This was checked from Registered PDD page 37 as well. The Project is using Diesel emission factor from 2006 IPCC guidelines and the value used is 74100 Kg/TJ or 74.1t/TJ. This was checked from 2006 IPCC guidelines & 1996 revised IPCC guidelines. The NCV used is 43TJ/Gg or 0.043 TJ/t. The value was checked from IPCC Guidelines 2006 & 1996 revised IPCC guidelines. These were accepted.

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 there is no change in registered PDD monitoring plan except the frequency of monitoring for which the deviation was sought and approved by EB in EB41 as mentioned in Section 5 also.

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 58386 tCO2 for the period 01/01/2007 to 30/06/2007 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 27120 tCO2 for the same period.

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.

This is the first verification and there was changes observed in the monitoring plan from the monitoring methodology and Registered PDD so a deviation was sought for the

measurement frequency which was accepted by EB and checked from UNFCCC website http://cdm.unfccc.int/Projects/Deviations/index.html

Post monitoring report on UNFCCC website

Yes, the monitoring report is available at ref. UNFCCC Project Reference Number 0674 on UNFCCC website

http://cdm.unfccc.int/UserManagement/FileStorage/BZAM45NSY7Q4O81H6CJ3Y7CLYYNM2R

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by SKS Ispat Limited to perform the verification of the emission reductions reported for the CDM project Waste Heat Recovery based captive power generation by SKS Ispat Ltd and UNFCC Reference Number 0674 in the period 01/01/2007 to 30/06/2007.

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 Waste Heat Recovery based captive power generation by SKS Ispat Ltd, dated 08/10/2008 and version 1.3 of monitoring report.

The management of the SKS Ispat 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 1.3 08/10/2008. Calculation and determination of GHG emission reductions from the project is the responsibility of the management of the SKS Ispat Limited. 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 01/01/2007 to 30/06/2007 based on the reported emission reductions in the Monitoring Report version 1.3 dated 08/10/2008 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:	Waste Heat Recovery based captive power generation by SKS Ispat Ltd
UNFCCC Project Number:	0674
Registered PDD:	Registered PDD version 1.2 dated 12/09/2006.
Approved Methodology:	ACM0004 version 02 dated 3rd March 2006
Applicable Period:	01/01/2007 to 30/06/2007
Total GHG Emission Reductions Verified:	**27120 tCO2**

Signed on behalf of the Verification Body by Authorized Signatory

Signature: 

Name: Siddharth Yadav

Date: 09-10-2008

8. Document References

/1/ Registered PDD version 1.2 dated 12th September 2006
/2/ Registered Validation Report
/3/ Monitoring Methodology ACM004 version 02 dated 3rd March 2006
/4/ Monitoring Report version 01 dated 16-07-2007
/5/ Monitoring Report version 1.1 dated 15-05-2008
/6/ Monitoring Report version 1.2 dated 26-06-2008
/7/ Auxiliary consumption calibration certificate for meter serial number PNL11653 for the monitoring period 01-01-2007 to 30-06-2007.
/8/ Total Electricity Generation calibration certificate for meter serial number PNL11658 for the monitoring period 01-01-2007 to 30-06-2007.
/9/ UNFCCC deviation
/10/ IPCC 2006 Guidelines
/11/ Spreadsheet of emission reductions
/12/ Calibration certificates for Total generation, & Auxiliary consumption
/13/ Training records provided by PP.
/14/ CDM Manual by PP.
/15/ Revised 1996 IPCC Guidelines
/16/ Monitoring Report version 1.3 dated 08-10-2008

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