
VALIDATION OPINION FOR REVISION OF REGISTERED MONITORING PLAN

Hanuman Agro Industries Limited

**2.5 MW Rice husk based
cogeneration plant at Hanuman
Agro Industries Limited**

UNFCCC Ref. No. 1667

SGS Climate Change Programme

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2.5 MW Rice husk based cogeneration plant at Hanuman Agro Industries Limited			
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SGS United Kingdom Limited		Hanuman Agro Industries Limited	
Subject:			
Validation Opinion for Revision of Registered Monitoring Plan:			
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	Executive Board of Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CSEB	Chhattisgarh State Electricity Board
DNA	Designated National Authority
DOE	Designated Operational Entity
GHG	Green House Gas(es)
GRN	Goods Receipt Note
GWh	Giga Watt Hour
HAIL	Hanuman Agro Industries Limited
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
MT	Metric Tonne
MWh	Mega Watt Hour
ODA	Official Development Assistance
PDD	Project Design Document
PD	Project Document
PP	Project Participant
PLC	Programmable Logic Control
TJ	Tera Joule
UNFCCC	United Nations Framework Convention on Climate Change

Table of Content

1. Validation Opinion	5
2. Introduction	7
2.1 Objective.....	7
2.2 Scope.....	7
2.3 GHG Project Description	7
3. Methodology.....	8
3.1 Review of CDM-PDD and Additional Documentation	8
3.2 Use of the Validation Protocol	8
3.3 Findings	8
3.4 Internal Quality Control	9
4. Validation Findings	10
4.1 Application of Monitoring Methodology and Monitoring Plan	10
4.2 Findings of Previous Verification Reports	14
5. List of Persons Interviewed	15
6. Document References	16
Annex 1: Validation Protocols	17
Annex 2: Overview of Findings	24
Annexure 3: Revised Monitoring plan (TRK Change mode).....	
Annexure 4: Revised Monitoring Plan (Clean version)	

1. Validation Opinion

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Hanuman Agro Industries Limited to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project 2.5 MW Rice husk based cogeneration plant at Hanuman Agro Industries Limited UNFCCC ref. no. 1667. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy and/or completeness in the proposed revision of the monitoring plan, and the conformity with approved monitoring methodology applicable to the project activity.

By applying the proposed revision of monitoring plan, the discrepancy in the parameters and the description for the monitoring plan was streamlined with the requirement of applied methodology AMS I.C, version 10. The indicated revisions will increase appropriateness and accuracy of the monitoring plan. All the relevant parameters are mentioned in the section 4.6 of this report. The revision in monitoring plan includes revising the parameters in B.6.2 and B.7.1, in line with the latest EB updates and also in line with the actual monitoring of the parameters by the PP. The revision is proposed with the aim to bring more clarity in the measurement of parameters like, Auxiliary Consumption by Power Plant (EG_{aux}), The electricity consumed by the Paper Section from the project activity (EG_{paper}), The electricity consumed by the Pulp Section from the project activity. (EG_{pulp}), Total quantity of steam generated per hour shall be maintained at Plant site in form of Shift Engineer's report ($Q_{totalsteam}$), Total quantity of steam supplied per hour to the paper and pulp section shall be maintained at Plant site in form of Shift Engineer's report ($Q_{processsteam}$) by including these parameters in the revised monitoring plan. The amount of surplus biomass available would be fixed ex-ante as per the revised monitoring plan.

Theoretically, there should be no impact on the materiality of emissions reduction calculation achieved by this project activity because the revision is aimed at inclusion of the all monitoring parameters in monitoring plan as per the applicable methodology and subsequent UNFCCC Clarifications for better transparency. By applying this said revision the emission reductions are quantified accurately. Other small changes are made to comments which do not have any significant effect rather any effect on ER calculations and are merely more descriptive and are incorporated to achieve clarity.

This revision improves the accuracy of information provided and consistency in the registered PDD and the monitoring plan.

Furthermore, we confirm that:

- (a) The proposed revision points have been described, and an assessment has been provided to substantiate the reasons for each of the proposed revision points of the registered monitoring plan, using objective evidence;
- (b) The proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions;
- (c) The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity whilst ensuring the conservativeness of the emission reductions calculation.
- (d) Project activity is undergoing first verification

Signed on Behalf of the Validation Body by Authorized Signatory

Signature:





Name: Siddharth Yadav

Date: 12-04-2011

2. Introduction

2.1 Objective

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Hanuman Agro Industries Limited to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project 2.5 MW Rice husk based cogeneration plant at Hanuman Agro Industries Limited and UNFCCC ref. no. 1667. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy or completeness in the proposed revision of the monitoring plan, and the conformity with the approved monitoring methodology applicable to the project activity.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM) and the host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

SGS reviewed the project design documentation (revised monitoring plan), using a risk based approach and conducted follow-up interviews.

2.2 Scope

The scope of the validation is defined as an independent and objective review of revision of monitoring plan. The information in these documents is reviewed against the Kyoto Protocol requirements, the UNFCCC rules and associated interpretations.

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

2.3 GHG Project Description

Refer to <http://cdm.unfccc.int/Projects/DB/SGS-UKL1204641540.4/view>, the project web page. There is no change in the project activity description. The project was registered on 07/11/2008 under UN Ref. Number 1667.

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors for the first monitoring period of the project using a validation protocol.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is partly based on the templates of the CDM Validation and Verification Manual version 1.2 (EB55 Annex.1):

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y/OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The validation protocol is attached with the report as Annex 1.

3.3 Findings

As an outcome of the validation 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 Assessor shall raise a **Clarification Request (CL)** specifying what additional information is required.

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

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

A Forward Action Request (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

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

Corrective Action Requests, Clarification Requests and Forward Action Requests are raised in the draft validation protocol and detailed in a separate form (Findings Overview). In this form, the Project Developer is given the opportunity to address and "close" outstanding CARs and respond to CLs and FARs. The detailed Finding Overview is attached with this document as Annex 2.

3.4 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.

4. Validation Findings

4.1 Application of Monitoring Methodology and Monitoring Plan

Type of Revision

The revision of monitoring plan is a result of recommendation by the DOE as mentioned in section B.6.2, B.7.1 and Annex- 4 of the registered PDD. The revision in monitoring plan includes revising the parameters in B.6.2 and B.7.1, in line with the latest EB updates and also in line with the actual monitoring of the parameters by the PP. The revision is proposed with the aim to bring more clarity in the measurement of parameters like, Auxiliary Consumption by Power Plant (EGaux), The electricity consumed by the Paper Section from the project activity (EGpaper), The electricity consumed by the Pulp Section from the project activity. (EGpulp), Total quantity of steam generated per hour shall be maintained at Plant site in form of Shift Engineer's report (Qtotalsteam), Total quantity of steam supplied per hour to the paper and pulp section shall be maintained at Plant site in form of Shift Engineer's report (Qprocesssteam) by including the parameters in the revised monitoring plan. The amount of biomass available would be fixed ex-ante as per the revised monitoring plan.

The proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revisions (details below).

In accordance with the guidance and methodological choice mentioned the monitoring plan of the registered PDD (version 04; dated 30/10/2008) stated the monitoring of following parameters in B.6.2 –

1. Calorific value of sub-bituminous coal (NCV_{coal})
2. Baseline Emission Factor for sub-bituminous coal (CO_2EF_{coal})
3. Baseline Emission Factor for Western Grid of India (BEF_e)
4. Boiler Efficiency (η_{th})

To improve the transparency and completeness of monitoring procedure and consistency of the applied Monitoring Methodology, the following monitoring parameters have been revised/ included in section B.6.2 of registered PDD:

Parameters fixed ex-ante as per the revised monitoring plan:

Sr. No	Parameter	Type of Parameter	Changes as per Registered PDD	Level of Accuracy and Completeness due to Revision
1.	Calorific value of sub-bituminous coal (NCV_{coal})	Fixed Ex-ante	No Change	Not Applicable
2.	Baseline Emission Factor for sub-bituminous coal (CO_2EF_{coal})	Fixed Ex-ante	No Change	Not Applicable
3.	Baseline Emission Factor for Western Grid of India (BEF_e)	Fixed Ex-ante	No Change	Not Applicable
4.	Boiler Efficiency (η_{th})	Fixed Ex-ante	No Change	Not Applicable
5.	Evaluation of Surplus Biomass within a range of 50 Km from plant site ($Q_{Biomass}$)	Fixed Ex-ante	Now included	The revision would not reduce the level of accuracy and completeness. This parameter is shifted from section B.7.1 to B.6.2 of PDD

The parameter serial numbers #5 as discussed above have been added further to the monitoring plan to demonstrate surplus biomass available at the time of validation as per the guideline of EB 47 Annex 28 clause 18 which was found to be correct and as per the requirement of the guideline. As per the biomass assessment carried out by SR Corporate in the year February 2007 for the district Raipur, the total amount of rice husk available in the region is 185660 MT of rice husk and the total demand of the region is 79834 MT, thus an excess of 105826 MT of rice husk. Thus the total availability of rice husk in the region is 56.99% in excess of total demand of the region. As per the registered PDD the PP has demonstrated that the surplus availability of rice husk in the 15 Km radius from the proposed plant site is assessed at 75,651 tonnes per annum whereas the plant is expected to consume 44,126 tonnes of rice husk at 100% capacity utilisation assuming a fuel mix ratio of 85:15. Hence the availability of biomass is about 41.67% larger than the required quantity of biomass for the project. Thus the excess availability of the region was found to be more than 1.25 times the demand of the entire region including the project activity and thus accepted that the parameter does not require to be monitored during the monitoring and can be fixed ex-ante. The parameter was earlier part of section B.7.2 and was a monitored parameter and in Revised Monitoring Plan it is shifted to section B.6.2 of registered PDD to make it as ex-ante parameter as per EB 47 Annex 28 clauses 18. There would be no effect on the calculation of the emission reduction due to the fixing of this parameter ex-ante as the parameter ensures availability of rice husk and has no direct relation with the emission reduction calculation.

In accordance with the guidance and methodological choice mentioned the monitoring plan of the registered PDD (version 04; dated 30/10/2008) stated the monitoring of following parameters in B.7.2 –

1. Total electricity generated from the project Activity. (EG_{Gross})
2. The electricity consumed by the Paper Mill from the project activity (EG_y)
3. Total quantity of biomass used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at stores department ($Q_{fc_biomass}$)
4. Total quantity of coal used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at supply department (Q_{fc_coal})
5. Evaluation of Surplus Biomass within a range of 50 Km from plant site ($Q_{biomass}$)

To improve the transparency and completeness of the monitoring procedure and consistency of the applied Monitoring Methodology, the following monitoring parameters have been revised and section B.7.1 and B.7.2 of registered PDD is revised. The description of measurement method and procedure to be applied, QA/QC procedure to be applied has been mentioned completely for each parameter. The name of team member column has been deleted from the table of roles and responsibilities of CDM monitoring team members. This was done because team member can be changed anytime and revision is found to be appropriate.

Parameters to be monitored as per the revised monitoring plan:

Sr. No	Parameter	Type of Parameter	Change as compared to Registered PDD	Level of Accuracy and Completeness due to Revision
1.	Total electricity generated from the project Activity. (EG_{Gross})	Measured	No Change	Not Applicable
2.	Auxiliary Consumption by Power Plant (EG_{aux})	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.2s accuracy meter
3.	The electricity consumed by the Paper Section from the project activity (EG_{paper})	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.2s accuracy meter

4.	The electricity consumed by the Pulp Section from the project activity. (EG_{pulp})	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.2s accuracy meter
5.	The electricity consumed by the Paper & Pulp Section from the project activity (EG_y)	Calculated	Now included	Not Applicable as this is a calculated parameter
6.	Total quantity of biomass used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at stores department ($Q_{fc_biomass}$)	Measured	No Change	Not Applicable
7.	Total quantity of coal used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at supply department (Q_{fc_coal})	Measured	No Change	Not Applicable
8.	Total quantity of steam generated per hour shall be maintained at Plant site in form of Shift Engineer's report ($Q_{totalsteam}$)	Measured	Now included	Accuracy level remains the same as the parameter has been renamed from the registered PDD to bring in more clarity.
9.	Total quantity of steam supplied per hour to the paper and pulp section shall be maintained at Plant site in form of Shift Engineer's report ($Q_{processsteam}$)	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.2s accuracy meter
10.	Pressure of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report ($P_{processsteam}$)	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.5s accuracy meter
11.	Temperature of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report ($t_{processsteam}$)	Measured	Now included	Accuracy level is increased as the parameter is directly related to the emission reduction and would be measured using Class 0.5s accuracy meter
12.	Steam Enthalpy	Calculated	Now included	Accuracy level is not affected as the Steam Enthalpy is based on the measured parameters of Steam Temperature and Pressure.

The Auxiliary consumption of the power plant was earlier not included in the monitoring plan, however to bring more clarity in the monitoring, the same has been now included. The parameter would be a directly measured parameter using a energy meter which would be calibrated on the basis of manufacturer's recommendation. Data will be captured on continuous basis through online PLC system and manually on hourly basis in logbooks.

The Electricity consumed at the Paper & Pulp section was earlier mentioned as a single parameter, this has now been divided into Electricity consumed by the Paper section from the project activity and Electricity consumed by the Pulp Section from the project activity. The total consumption of electricity by the Paper & Pulp Section would be calculated as the sum of Electricity consumed at the Paper section and Electricity consumed at the Pulp Section. The parameters would be directly measured parameter with the use of energy meters which would be calibrated on the basis of manufacturer's recommendations. Data will be captured on continuous basis through online PLC system and manually on hourly basis in logbooks.

Steam generation parameters have also been proposed to be revised as per the revised monitoring plan. To bring in more clarity, the Total quantity of steam generated per hour shall be maintained at Plant site in form of Shift Engineer's report and also Total quantity of steam supplied per hour to the paper and pulp section shall be maintained at Plant site in form of Shift Engineer's report. These two parameters would be monitored using steam flow meters which would be calibrated based on manufacturer's recommendation. Data will be captured on a continuous basis through online PLC system and manually on hourly basis in logbooks.

Pressure of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report. This would be a measured parameter as per the revised monitoring plan and would be measured using a pressure gauge which would be calibrated as per manufacturer's recommendation. Data will be captured on continuous basis through online PLC system and manually on hourly basis in logbooks.

Temperature of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report. This would be a measured parameter as per the revised monitoring plan and would be measured using a temperature gauge which would be calibrated as per manufacturer's recommendation. Data will be captured on continuous basis through online PLC system and manually on hourly basis in logbooks.

There would be no change in the algorithm of calculation of emission reduction by the revision of monitoring plan.

The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity (details below).

The approved methodology AMS I.C version 10 clause 17 (b) mentions: "Metering the thermal and electrical energy generated for co-generation projects. In the case of co-fired plants, the amount of fossil fuel input shall be monitored"

In accordance to the above methodological requirement, the PP has revised the monitoring plan by metering the following parameters which would cover up the requirement of the metering of energy generated for co-generation project:

Sr. No	Parameter	Type of Parameter	Conformance with the Methodology
1.	Total electricity generated from the project Activity. (EG _{Gross})	Measured	Confirmed to be meeting the requirement with 0.2s class metering
2.	Auxiliary Consumption by Power Plant (EG _{aux})	Measured	Confirmed to be meeting the requirement with 0.2s class metering
3.	The electricity consumed by the Paper Section from the project activity (EG _{paper})	Measured	Confirmed to be meeting the requirement with 0.2s class metering
4.	The electricity consumed by the Pulp Section from the project activity. (EG _{pulp})	Measured	Confirmed to be meeting the requirement with 0.2s class metering
5.	The electricity consumed by the Paper	Calculated	No metering applicable. This is in

	& Pulp Section from the project activity (EGy)		accordance with the methodology
6.	Total quantity of biomass used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at stores department ($Q_{fc_biomass}$)	Measured	Confirmed to be meeting the requirement of the methodology
7.	Total quantity of coal used for generation of power & steam shall be maintained at Plant site in form of Daily logbooks at supply department (Q_{fc_coal})	Measured	Confirmed to be meeting the requirement of the methodology
8.	Total quantity of steam generated per hour shall be maintained at Plant site in form of Shift Engineer's report ($Q_{totalsteam}$)	Measured	Confirmed to be meeting the requirement with 0.2s class metering
9.	Total quantity of steam supplied per hour to the paper and pulp section shall be maintained at Plant site in form of Shift Engineer's report ($Q_{processsteam}$)	Measured	Confirmed to be meeting the requirement with 0.2s class metering
10.	Pressure of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report ($P_{processsteam}$)	Measured	Confirmed to be meeting the requirement with 0.5s class metering
11.	Temperature of process steam supplied per hour shall be maintained at Plant site in form of Shift Engineer's report ($t_{processsteam}$)	Measured	Confirmed to be meeting the requirement with 0.5s class metering
12.	Steam Enthalpy	Calculated	No metering applicable. This is in accordance with the methodology

This revision improves the accuracy of information provided and consistency in the monitoring plan. The proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revisions.

The revised determination procedure of calculating the total Electricity in the Paper & Pulp section and the Quantity of steam generated and the Quantity supplied to the Paper and Pulp sections were found to be logical and in coherence with the actual scenario as identified by the assessment team during the site visit which triggered the revision, and thus the approach have been found appropriate.

The revised EGy calculation approach has been found completely consistent with the approved version of AMS I.C version 10 thus this revised approach for EGy determination has been accepted.

Thus it is to confirm that the all above conditions as specified by the methodology are fulfilled for this project activity. Thus the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology AMS I.C version 10 applicable to the project activity.

The revised determination procedure of "The electricity consumed by the Paper & Pulp Section from the project activity" (EGy) and the "Quantity of steam to paper and pulp section" will not impact the materiality of the emission reduction calculation for the current project activity. This revision improves the accuracy of information provided and consistency in registered PDD and the monitoring methodology.

4.2 Findings of Previous Verification Reports

No FAR was observed from the validation report and this is prior to the first issuance hence no such previous monitoring period is applicable.

5. List of Persons Interviewed

Date of site visit	Name	Position	Short description of subject discussed
26/11/2010-27/11/2010	Mr. Anil Kanoria	Director	Overall verification procedures, Ownership, commissioning details etc.
26/11/2010-27/11/2010	Mr. Anjan Kanoria	Managing Director	Overall verification procedures, Ownership, commissioning details etc.
26/11/2010-27/11/2010	Mr. Raj Kumar Thakur	General Manager	Verification of monitoring and data handling procedure (reporting, recording and data archiving)
26/11/2010-27/11/2010	Ritu S Jain	Consultant.	Monitoring Report
26/11/2010-27/11/2010	Mr. P K Das	Senior Electrical Engineer	Site visit: Inspection of infrastructure and equipments, calibration, maintenance, personnel training. Detailed review of project activity and verification of monitoring procedures implementation, Monitored data verification. Interview of persons involved in project monitoring
26/11/2010-27/11/2010	Mr. Kamod Choudhury	Boiler In charge	Site visit: Inspection of infrastructure and equipments, calibration, maintenance, personnel training. Detailed review of project activity and verification of monitoring procedures implementation, Monitored data verification. Interview of persons involved in project monitoring
26/11/2010-27/11/2010	Mr. Asif Jamal	TG- In charge	Site visit: Inspection of infrastructure and equipments, calibration, maintenance, personnel training. Detailed review of project activity and verification of monitoring procedures implementation, Monitored data verification. Interview of persons involved in project monitoring

6. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ Revised Monitoring Plan –HAIL_RMP_track change- V01 14022011
- /2/ Revised Monitoring Plan –HAIL_RMP_clean mode – V01 14022011
- /2a/ Revised Monitoring Plan –HAIL_RMP_track change- V02 10032011
- /2b/ Revised Monitoring Plan –HAIL_RMP_clean mode – V02 10032011

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /3/ <http://cdm.unfccc.int/Projects/DB/SGS-UKL1204641540.4/view>
- /3/ Registered PDD dated 30/10/2008, registered to UNFCCC on 07/11/2008
- /4/ AMS I.C version 10
- /5/ Validation Report: <http://cdm.unfccc.int/Projects/DB/SGS-UKL1204641540.4/view>



Annex 1: Validation Protocols

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
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Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.1. General Requirements				
A.1.1. Is the revision in the monitoring plan based on a decision by the CDM EB	EB49, Annex 29	DR	No this revision in monitoring plan is not requested by CDMEB, the proposed revision in monitoring plan includes revisions proposed by the PP/DOE to maintain consistency with the monitoring methodology	Y
A.1.2. Is the revision based on a decision by CDM EB but also additional revisions are proposed by the PP/DOE	EB49, Annex 29	DR	No, the proposed revision in monitoring plan includes revisions proposed by the PP/DOE	Y
A.1.3. Is the need for revision in monitoring plan spotted during the first monitoring period?	EB49, Annex 29 Project page on UNFCCC website	DR	Gaps in the monitoring were observed during verification of first monitoring period. SGS was further contacted for the RMP.	Y
A.1.4. Is the revised monitoring plan complete and does the revised monitoring plan follow the registered PDD template?	Registered PDD	DR	The revised monitoring plan is complete document and follows the same template used for registered PDD. Revised document (plan) contains the pages relevant only to monitoring plan and no additional pages	Y
A.1.5. Has the revised monitoring plan submitted in track change mode for each of the revision point (issue)?	Revised monitoring plan	DR	PP has submitted a revised monitoring plan in track change mode (word file) to DOE Track change mode and clean mode is included in the submission from PDD.	Y
A.1.6. is there an objective evidence for each of the proposed revision point (issue)?		Site Visit	Yes there are objective evidences of the additional parameters provided which have been cross verified during the site visit and found consistent.	Y
A.1.7. Does the revised monitoring plan also include the Annex 4?	Registered PDD	DR	Yes the Annex 4 of the PDD is also include and is in track change mode.	Y
A.1.8. Does the revised monitoring	Registered	DR	There is no change in the project registered design due to the change in the revised	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
plan lead/associate to any kind of change in the project registered design?	PDD & EB48 Annex 66-67		monitoring plan. Only the algorithm is revised.	
A.2. Data and Parameters Monitored				
A.2.1. Does the revised monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. 91a/91d/121 Revised MP Section B.7 EB49, annex 2, para 9	DR	Revised monitoring plan contains all necessary parameters to improve transparency in monitoring procedure and the conformity with approved monitoring methodology. It is confirmed that changes in the revised monitoring plan should have no impact on the calculation of the emissions reduction achieved by this project activity. Revised MP includes the data management and quality assurance and quality control procedures to ensure the delivery of unambiguous data The PP has to include schematic diagram of the metering locations for the meters involved in the project activity. This is a part of annexure to RMP or need to include in RMP The RMP document was checked and the schematic diagram was found to be in place with the metering clearly being indicated. CAR 01 was closed out.	CAR 01 CAR 01 closed Y
A.2.2. Are the changes in the monitoring plan inline to the applied methodology and tool?	AMS I.C version 10	DR	Revised monitoring plan is inline with applicable methodology AMS I.C, version 10	Y
A.2.3. Are the changes affecting the ER calculation (directly/indirectly)?	Revised MP	DR	The RMP would not affect the emission reduction calculation	Y
A.2.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	RMP Section B.7	DR	Information's for each monitoring parameter provided in a transparent manner	Y
A.2.5. Has there been an issuance with the original monitoring plan of	Project page on UNFCCC website	DR	No there has been no issuance prior to this with the original monitoring plan of the registered PDD	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.2.6. the registered PDD in the past? if so how did the identified gaps effect the ER calculations for the monitoring periods in the past?			There has been no gaps identified that would effect the ER calculation for the monitoring periods in the past.	
A.2.7. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	RMP Section – B.7	DR	Revised MP includes the data management and quality assurance and quality control procedures to ensure the delivery of unambiguous data.	Y
A.2.8. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	RMP Section- B.7	DR	Revised MP includes the data management and quality assurance and quality control procedures to ensure the delivery of unambiguous data.	Y
A.2.9. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	Revised MP Section -B.7	DR	All formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	Y
A.3. Quality Control (QC) and Quality Assurance (QA) Procedures				
A.3.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121	DR	Revised MP includes the data management and quality assurance and quality control procedures to ensure the delivery of unambiguous data. It is also confirmed by means of review of the documented procedures, interviews with plant personnel and physical inspection of the proposed CDM project activity site that project participant has ability to implement the monitoring plan.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.3.2. in case, a revision is proposed, the impact of the revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9		Revised monitoring plan should have not result in reduced level on accuracy and completeness in the monitoring and verification process because the revision is aimed to describe the monitoring procedure in a transparent manner as per the applicable methodology PP is requested to mention the recording frequency and calibration frequency for the monitoring parameters for better transparency as per para 9 a) of Annex 28 EB49. If this parameter is recorded hourly then PP has to confirm and mention possible recording frequency. PP has to follow it for all parameters. The document of RMP was checked and the recording frequency of all the parameters along with the QA & QC of the meters, accuracy class of meter etc were all found to be included in the RMP document. Hence CAR 02 was closed out.	CAR 02 CAR 02 closed Y
A.3.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR	Revised MP includes the data management and quality assurance and quality control procedures to ensure the delivery of unambiguous data.	Y
A.3.4. Is it ensured that data will be bound to national or internal reference standards?	VVM Para. 86d	DR	All the monitoring data are compliance with national and sectoral policies and circumstances are considered and listed in the PDD.	Y
A.4. Operational and Management Structure				
A.4.1. Is the authority and responsibility of project management clearly described?	PDD Section B.7.2 /Annex 4	DR	Authority and responsibility of project management is described in transparent manner in Annex 4 of registered PDD and also followed in revised MP	Y
A.4.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.7.2/Annex 4	DR	Authority and responsibility for registration, monitoring, measurement and reporting clearly described in Annex 4 of registered PDD also followed in revised MP	Y
A.5. Monitoring Plan (Annex 4)				

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.5.1. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	VVM Para. 122b	DR	<p>Revised monitoring plan describe the measures to be implemented for monitoring all parameter clearly and QA/QC procedure to ensure delivery of quality data.</p> <p>PP is requested to confirm if the recording frequency is hourly for the parameter for steam flow. Since steam flow meter is a cumulative meter, daily reading is also appropriate to avoid manual error due to hourly reading, the PP is requested to confirm it.</p> <p>PP has to clarify why the calculation approach of net quantity of steam/heat supplied is not mentioned in RMP. The use of enthalpy of steam for the calculation is not described in the parameters, PP is requested clarify how RMP is transparent about this calculation.</p> <p>The calculation of the steam/heat supplied has been included in the RMP document and has been correctly mentioned in the RMP document. Hence CL 03 was closed out.</p>	<p>CL-03</p> <p>CL 03 closed</p> <p>Y</p>
A.5.2. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	VVM Para. 122b	DR	Revised monitoring plan includes all the information's about monitoring equipments involved in project activity.	Y
A.5.3. Is there any change proposed in the specifications of the monitoring equipment or their positioning or installation then the impact of the change due to revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9		Not applicable	Y
A.5.4. Are procedures identified for calibration of monitoring	VVM Para. 122a-c	DR	Revised monitoring plan mentions the calibration procedure for monitoring equipments. Please refer CAR 02 for detail.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
equipment?				
A.5.5. Is there any change proposed in the calibration procedures, if yes then the impact of the change due to revision should not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9		There is no change proposed in the calibration procedure.	Y
A.5.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	VVM Para. 122a-c	DR	Data handling and data recoding procedure discussed in revised monitoring plan inline with the requirements of methodology	Y
A.5.7. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	VVM Para. 122a-c	DR	Monitoring arrangements described in the revised monitoring plan are feasible within the project design	Y

Annex 2: Overview of Findings

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	02	01	Nil

Date:	01/03/2011	Raised by:	Shivaji Chakraborty		
Type:	CAR	Number:	01	Reference:	A.2.1
Lead Assessor Comment:			Date: 03/01/2011		
The PP has to include schematic diagram of the metering locations for the meters involved in the project activity. This is a part of annexure to RMP or need to include in RMP					
Project Participant Response:			Date: 10/03/2011		
Schematic diagram of the metering locations for the meters involved in the project activity has been include in the RMP V01 in Annex 4.1					
Documentation Provided as Evidence by Project Participant:					
RMP V02 dated 10/03/2011					
Information Verified by Lead Assessor:					
RMP V02 dated 10/03/2011					
Reasoning for not Acceptance or Acceptance and Close Out:					
The RMP document was checked and the schematic diagram was found to be in place with the metering clearly being indicated. CAR 01 was closed out.					
Acceptance and Close out by Lead Assessor: Closed			Date: 12/03/2011		

Date:	01/03/2011		Raised by:	Shivaji Chakraborty		
Type:	CAR	Number:	02		Reference:	A.3.2
Lead Assessor Comment:				Date: 03/01/2011		
PP is requested to mention the recording frequency and calibration frequency for the monitoring parameters for better transparency as per para 9 a) of Annex 28 EB49. If this parameter is recorded hourly then PP has to confirm and mention possible recording frequency. PP has to follow it for all parameters.						
Project Participant Response:				Date: 10/03/2011		
The recording frequency and calibration frequency for all parameters have been included in the RMP, Section B.7 has been modified suitably for better transparency.						
Documentation Provided as Evidence by Project Participant:						
RMP V02 dated 10/03/2011						
Information Verified by Lead Assessor:						
RMP V02 dated 10/03/2011						
Reasoning for not Acceptance or Acceptance and Close Out:						
The document of RMP was checked and the recording frequency of all the parameters along with the QA & QC of the meters, accuracy class of meter etc were all found to be included in the RMP document. Hence CAR 02 was closed out.						
Acceptance and Close out by Lead Assessor: Closed				Date: 12/03/2011		

Date:	01/03/2011		Raised by:	Shivaji Chakraborty		
Type:	CL	Number:	03		Reference:	A.5.1
Lead Assessor Comment:				Date: 03/01/2011		

PP is requested to confirm if the recording frequency is hourly for the parameter for steam flow. Since steam flow meter is a cumulative meter, daily reading is also appropriate to avoid manual error due to hourly reading, the PP is requested to confirm it.	
PP has to clarify why the calculation approach of net quantity of steam/heat supplied is not mentioned in RMP. The use of enthalpy of steam for the calculation is not described in the parameters, PP is requested clarify how RMP is transparent about this calculation.	
Project Participant Response:	Date: 10/03/2011
Agreed and Confirmed. The calculation approach is also included in the revised RMP.	
Documentation Provided as Evidence by Project Participant:	
RMP V02 dated 10/03/2011	
Information Verified by Lead Assessor:	
RMP V02 dated 10/03/2011	
Reasoning for not Acceptance or Acceptance and Close Out:	
The calculation of the steam/heat supplied has been included in the RMP document and has been correctly mentioned in the RMP document. Hence CL 03 was closed out.	
Acceptance and Close out by Lead Assessor: Closed	Date: 12/03/2011

Annex 3: Statement of Competence

Statement of Competence

Name: Shivaji
Chakraborty

Status

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

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	
Technical Area(s):	
2. Energy Distribution	x
Technical Area(s): TA 2.1 Electricity distribution TA 2.2 Heat distribution	
3. Energy Demand	x
Technical Area(s): TA 3.1 Energy Demand	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 17/12/2010

Statement of Competence

Name: Sanjay Banerjee

Status

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

Scopes of Expertise

5. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.2 Energy generation from renewable energy resources.	
6. Energy Distribution	
Technical Area(s):	
7. Energy Demand	
Technical Area(s):	
8. Manufacturing	
Technical Area(s):	
16. Chemical Industry	
Technical Area(s):	
17. Construction	
Technical Area(s):	
18. Transport	
Technical Area(s):	
19. Mining/Mineral Production	
Technical Area(s):	
20. Metal Production	
Technical Area(s):	
21. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
22. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
23. Solvent Use	
Technical Area(s):	
24. Waste Handling and Disposal	
Technical Area(s):	
25. Afforestation and Reforestation	
Technical Area(s):	
26. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 05/01/2011

Statement of Competence

Name: Sandeep Kurmi

Status

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

Scopes of Expertise

9. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.	
10. Energy Distribution	
Technical Area(s):	
11. Energy Demand	x
Technical Area(s): TA 3.1 Energy Demand	
12. Manufacturing	x
Technical Area(s): TA 4.n Other then 4.1-4.4	
27. Chemical Industry	
Technical Area(s):	
28. Construction	
Technical Area(s):	
29. Transport	
Technical Area(s):	
30. Mining/Mineral Production	
Technical Area(s):	
31. Metal Production	
Technical Area(s):	
32. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
33. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
34. Solvent Use	
Technical Area(s):	
35. Waste Handling and Disposal	
Technical Area(s):	
36. Afforestation and Reforestation	
Technical Area(s):	
37. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 14/01/2010

Statement of Competence

Name: Ramkrishn
a Patil

Status

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

Scopes of Expertise

13. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
14. Energy Distribution	<input checked="" type="checkbox"/>
Technical Area(s): TA 2.1 Electricity distribution TA 2.2 Heat distribution	
15. Energy Demand	<input checked="" type="checkbox"/>
Technical Area(s): TA 3.1 Energy Demand	
16. Manufacturing	<input type="checkbox"/>
Technical Area(s):	
38. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
39. Construction	<input type="checkbox"/>
Technical Area(s):	
40. Transport	<input type="checkbox"/>
Technical Area(s):	
41. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
42. Metal Production	<input type="checkbox"/>
Technical Area(s):	
43. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
Technical Area(s):	
44. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
Technical Area(s):	
45. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
46. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
47. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
48. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 20/01/2011

Statement of Competence

Name: Sarang Khati

Status

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

Scopes of Expertise

17. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.	
18. Energy Distribution	<input type="checkbox"/>
Technical Area(s):	
19. Energy Demand	<input type="checkbox"/>
Technical Area(s):	
20. Manufacturing	<input checked="" type="checkbox"/>
Technical Area(s): TA 4.4 Refinery (Oil and gas)	
49. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
50. Construction	<input type="checkbox"/>
Technical Area(s):	
51. Transport	<input type="checkbox"/>
Technical Area(s):	
52. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
53. Metal Production	<input type="checkbox"/>
Technical Area(s):	
54. Fugitive Emissions from Fuels (solid, oil and gas)	<input checked="" type="checkbox"/>
Technical Area(s): TA 10.2 Oil and Gas industry, coal mine methane recovery and use.	
55. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
Technical Area(s):	
56. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
57. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
58. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
59. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 17/12/2010

